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THE
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A WEEKLY

ILLUSTRATED JOURNAL

OF

ART,

CIVIL ENGINEERING,

AND

BUILDING.

"The arts only flourish where they are appreciated by the nation at large, and where the taste of the public is correct."—H. GALLY KNIGHT.

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THE ARCHITECT.

A JOURNAL OF ART, CIVIL ENGINEERING, AND BUILDING

THE WEEK.

THE Winter Exhibition of Old Masters at the Royal Academy is again devoted to paintings and drawings. It is remarkable that the experiment of 1888, when Renaissance work in metal and marble was introduced, has not been tried this year. It ought also to be possible to obtain examples of English sculpture. Some variation is desirable, for the exhibitions will soon be considered as monotonous. The gallery in Glasgow has been drawn upon this year, and the compliment will cause the citizens to appreciate their property, and to hasten the construction of a gallery where their pictures will be visible. One of the examples is by GIORGIONE, another by REMBRANDT, a third is by HUGO VAN DER GOES, and there is also a painting by MABUSE. From the Wallace Collection several pictures have been lent, and as in late years there are works by Spanish painters. ROMNEY is the strongest representative of the English School in the exhibition. There are also portraits by BEECHEY, ZOFFANY, HONE, and HOPPNER. TURNER'S *Vintage of Macon* was a noble work. In the water-colour room are some drawings by BLAKE, but they are not in his best manner. Taken as a whole, the exhibition is not likely to be popular on account of its attractiveness.

It is understood that the Government have decided to postpone the carrying out of Mr. ASTON WEBB'S plans for the completion of the South Kensington Museum. Preparations had been made in order that no objects in the museum should suffer from the building works, and that the workmen might not be restricted for space. But all that labour has been in vain. It is unfortunate that Mr. SHAW-LEFEVRE should always be placed in a false position while in office. He is permitted to assume the position of a statesman who believes with BURKE that to expend money on public buildings is always an advantage for a country. But as yet his name is not associated with any great works. In the case of South Kensington we consider it would have served his reputation if he displayed more energy. The project was no doubt made definite by the late Government, but it was a legacy from preceding Governments, and in fact statesmen of all parties are responsible for the delays. That the museum should be allowed to remain so long in an incomplete condition is not creditable to the country.

THE Secretary of the Society for the Preservation of Ancient Buildings does not appear to be able to perceive that when his committee blunders, the best course is to be silent. By posing as infallible, he makes the Society ridiculous. The statues of St. Mary's, Oxford, he wished to preserve, as if they were as valuable as the figures at Wells, are modern. He has attempted to get over his error by laying down propositions which are untenable. Mr. JACKSON found little difficulty in replying to the statements of Mr. TURNER, which we have printed on account of their amusing character. He now proposes two alternatives, writes Mr. JACKSON:—"1. To remove the statues, and leave their places untenanted. This certainly would not take any-

body in, but, on the other hand, it would spoil the steeple. The statues are as much a part of the design as the pinnacles. They are necessary to its outline. They give meaning to the niches and life to the composition. What right have we to leave the design imperfect and mar the beauty of the steeple in order that careless antiquaries may not go wrong in their dates? Surely pedantry can go no further. 2. 'To carve statues which being frankly modern can never be mistaken for the productions of another century than our own.' But what does Mr. TURNER mean by 'frankly modern'? The builders of St. Mary's steeple in the time of EDWARD I. and EDWARD II. robed the saints, kings, archbishops and bishops whose figures fill the niches in the costume of the fourteenth century. This was frankly modern, and had they done otherwise they would not have been the men they were. But now that we have to renew the figures, are we to dress them in the costume of our own day, the Saxon prelates in lawn sleeves and rochet, and EDWARD II. in the coronation robes of WILLIAM IV.? This would be doing exactly what was done by the builders of the steeple, and would certainly be 'frankly modern,' but I doubt whether Mr. THACKERAY TURNER would be pleased with the result." The Society has done good work, but there is no reason why the committee should on that account be authorised to express rash judgments, or to confound modern with ancient work.

It is difficult to believe, when looking at the Zuyder Zee as it now appears, that the great expanse of water was unknown prior to 1282, when there was an extraordinary inundation. The Zee is a busy place, and would appear to be invaluable to Amsterdam. But however much they may care for ships and trade, the Dutch people have never ceased to grieve over the hundreds of thousands of acres which were submerged. The success which has crowned attempts to convert sea into land in many parts of Holland has prompted many engineers to think over schemes for the reclamation of at least a part of the Zuyder Zee. In 1886 a society was formed with the object of preparing for the work. It has required nearly six years for the preliminary inquiries. At length a scheme has been prepared. It is proposed to construct a dyke at the northern and narrow part of the gulf, about sixty miles from Amsterdam. It will run from the island of Wieringen to the province of Friesland. The chief obstacle which has retarded the reclamation has been a dread of interference with the trade of Amsterdam. The completion of the great Northern Canal has made the city to some extent independent of the Zee. It is, however, intended to retain a lake or small sea out of the waters, which will be united by means of canals with the city and other towns. It is assumed that if the operations are successful at least 570,000 English acres of land, or about ninety square miles, will be recovered, and the greater part will be suitable for agriculture. The outlay may be assumed at twenty millions sterling, and the works will require thirty years before they are accomplished. It is understood that the Government will approve of the undertaking.



THE TRIUMPH OF LOVE. By J. B. Hüet.

J. B. HUET.*

THE largest monograph and the one with the most abundant illustrations that has appeared in the series "Les Artistes Célèbres" is devoted to JEAN-BAPTISTE HÜET and his three sons. The book is a sort of act of justice towards a designer who is entitled to a place among the artists that were famous. Many of our readers probably have never heard of HÜET, and ignorance is excusable, for the only man of the name who is introduced in most French biographical dictionaries was a bishop. JEAN-BAPTISTE HÜET was not only one of the greatest of draughtsmen with animal subjects, but he was one of the most imaginative and graceful designers of the eighteenth century. As an etcher of certain subjects, he

have to notice, came into this world, in the memorable year 1745. We have always imagined that the tenants of the Louvre in those days were a peculiar species of Bohemians. They took airs on themselves as became Royal officials, and yet they were the most dependent of mortals. Their income was precarious, for it appeared to come from the balance left after paying for various luxuries of the Court. If so, JEAN-BAPTISTE profited by the examples he saw around him in his youth, for he endeavoured to be thrifty, industrious and respectable. As he was brought up amidst artists, and was a sharp lad, it is difficult to determine when he commenced his studies; probably he was obliged to become useful to his father or some other painter in the Louvre as soon as he could handle a pencil. But



A DEDICATION PAGE. By J. B. Hüet.

has not been surpassed for simplicity, vigour and completeness. In fact, M. GABILLOT is right when he asserts that HÜET was "un artiste qui eut en lui l'étoffe de plusieurs artistes." As became a man of his class, HÜET spent his days in constant work, and his biography is therefore not marked by startling events.

It was one of the distinctions of JEAN-BAPTISTE that he was borne in the Louvre. When Royalty preferred other palaces, some of the buildings of the Louvre were assigned to artists and decorators, who were occupied as auxiliaries to the pride, pomp and circumstance of French kings. As NICOLAS HÜET was attached to the Royal furniture department as a herald painter (it was supposed he was an architect), he obtained a residence in the Louvre, and it was there his only son, whose career we

the artist who appears to have had the earliest influence on him was an outsider, a M. DEGOMMER, whose name, we apprehend, would not be of much power in CHRISTIE'S rooms. He painted animal subjects, some of which were engraved. Then he was with J. LE PRINCE, to whom he dedicated a volume of etchings, and afterwards he came under the influence of BOUCHER. There are designs by him which would easily be taken for BOUCHER'S work. We can realise that so promising a young fellow was coveted by many established painters as a disciple. His future seemed destined to be successful, and in those days, as now, the fame of French artists was a triumph for all who aided in their instruction. That HÜET had friends among the painters as well as at Court is evident when we learn that he was elected to the Academy when he was in his twenty-fourth year. He was also assigned a residence in the Louvre, and he remained there until the end of the century, when a new régime was in power.

* *Les Artistes Célèbres: Les Hüet.* Par C. Gabillo. (Paris: Allison & Co.)

In 1769, the year of his election, HÜET's pictures in the Salon exhibition were noticed by DIDEROT. The critic considered the painting was stronger than the modelling, and in consequence there was a want of harmony. Another critic, BOULMIERS, who apparently was acquainted with animals, declared there was no such discord, and he referred to HÜET's studies as being as beautiful as those by BERGHEM. At the next exhibition, two years afterwards, DIDEROT was more disposed to recognise the value of the young painter. He said that HÜET had not dethroned either DESPORTES or OUDRY, but he admitted the talent and the industry of the new-comer. His drawings of animals were pointed to as "assez bonnes." Apparently the critic, who was one of the pioneers of realism in literature, was, while in the Salon, rather disposed to have reverence for the ideals. Or was it that he was without opportunities to study wild animals, and felt that he was out of place when he sat in judgment on HÜET? In spite

as examples for imitation, or to enjoy from their intrinsic interest.

HÜET would not be allowed to depart from one class of subjects as an oil-painter, but there was no restriction of that kind in respect of his minor works. He designed so many varieties of compositions he might have been an "artist to the trade." HÜET could produce figures as fleshly as BOUCHER's or as ideal as PRUDHON's. Landscapes, flowers, birds, conventionalised ornament came from his hand in an abundance that is surprising. What is no less remarkable is that the treatment was Protean. As a rule, a painter's manner can be traced in his slightest sketches. But HÜET appeared to assume the style of a different artist for each variety of production. In the woodcuts this versatility is suggested, but of course it becomes more conspicuous when, as in M. GABILLOT's biography, there are nearly two hundred examples to consider. Nor was he above aiding manufacturers. M. CHARLES BLANC describes



A STUDY. By J. B. Hüet.

of all that was said against his paintings, HÜET by 1773 had gained sufficient success to make an engraving from one of his works a profitable speculation, and one of his *Laitière* was in the Salon of that year. Six years afterwards HÜET attempted a more academical subject, *Hercules and Omphale*, on a large scale, but it was not appreciated by critics or public, and if the artist were less of a favourite he must have succumbed to the ridicule it excited. He took the lesson in good part, and France did not lose the best animalier of that time.

The paintings in oil which he exhibited in the Salon were only a part of his productions. The representation of life gave him pleasure, and he was glad to employ any process that was facile. He produced drawings in chalk or in washes with marvellous expedition. Many people who could not afford to purchase his oil-paintings were glad to obtain his designs. The sketches were also useful for engravers to copy. In course of time he found that amateurs were glad to obtain his etched studies of animals

some of his designs for wall-papers: one series related to the history of PSYCHE, another to the legend of GENEVIÈVE of Brabant. He drew several friezes which were intended for the decoration of furniture. Quite recently pieces were sold at a high price which were described in the catalogue as *Sujets Hüet*, and he was one of the artists who were most successful in that classical style which seemed to be a consequence of the sacrifices that were offered by the first Revolutionists.

Between 1787 and 1800 it appears HÜET did not exhibit at one of the Salon exhibitions. When his work reappeared in 1800 it had to be subjected to criticism that was inspired by new canons. His animals and country scenes did not give satisfaction to visitors, who believed they were resuscitated Romans, and wished to have their heroic emotions excited by pictures. He tried to correspond with the desire to have all things French aggrandised by painting two sheep full size. He found his models in the Jardin des Plantes, and used an immense canvas to

represent them. The work has disappeared, but it was considered to be HÜET's masterpiece. It was offered to the Louvre by a son of the artist, but the Director was indifferent to its value, and rejected it. HÜET ceased to exhibit after 1802. The spoils which were derived from BUONAPARTE'S early campaigns required a large area to accommodate them, and the survivors of the artists who occupied parts of the Louvre were ejected to make room for paintings and statues. HÜET was compelled to leave a place where his

If JEAN-BAPTISTE HÜET had been more ambitious his name would be more familiar. His cleverness, however, tempted him into many fields of art. As he was thrown among artists from his childhood he could hardly fail to be an imitator of the ablest of them, and, his ability aiding, he became versatile. Several of the French artists of our time resemble him. They are not content with painting large pictures; circumstances often compel them to execute work of less importance, and which is not always acknow-



A FRIEZE. By J. B. Hüet.



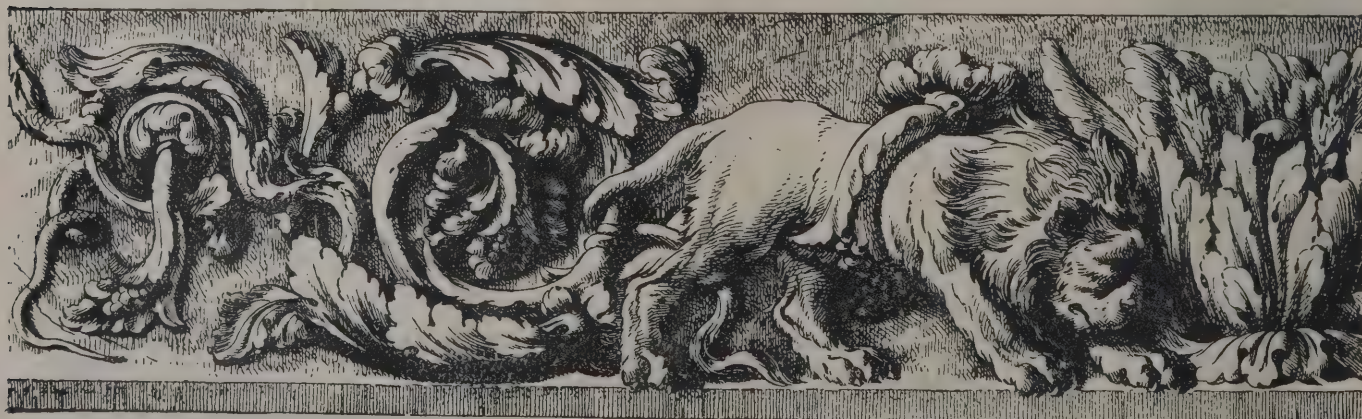
A FRIEZE. By J. B. Hüet.



VIGNETTE TITLE. By J. B. Hüet.

life had been spent, but some annual allowance was made to him in compensation, for in the Catalogue of 1802 he is described as member of the former Academy of Painting and pensioner of the State. He was, moreover, able to purchase a property near Longjumeau, and he had also a suburban house at Sèvres. His productiveness was therefore advantageous to himself. But through some unrevealed cause he was obliged to dispose of parts of his estate in 1807—that is, four years before his death.

HÜET's name ought, therefore, to be held in respect by French artists, for he was a type of many among them. In all countries where art obtains attention he deserves remembrance for his cleverness. In England little could be known about HÜET, but henceforth—thanks to M. GABILLOT and the director of the series—we are in the position of Frenchmen, and can study numerous reproductions of the best works of a man who was not inferior to any of his contemporaries.

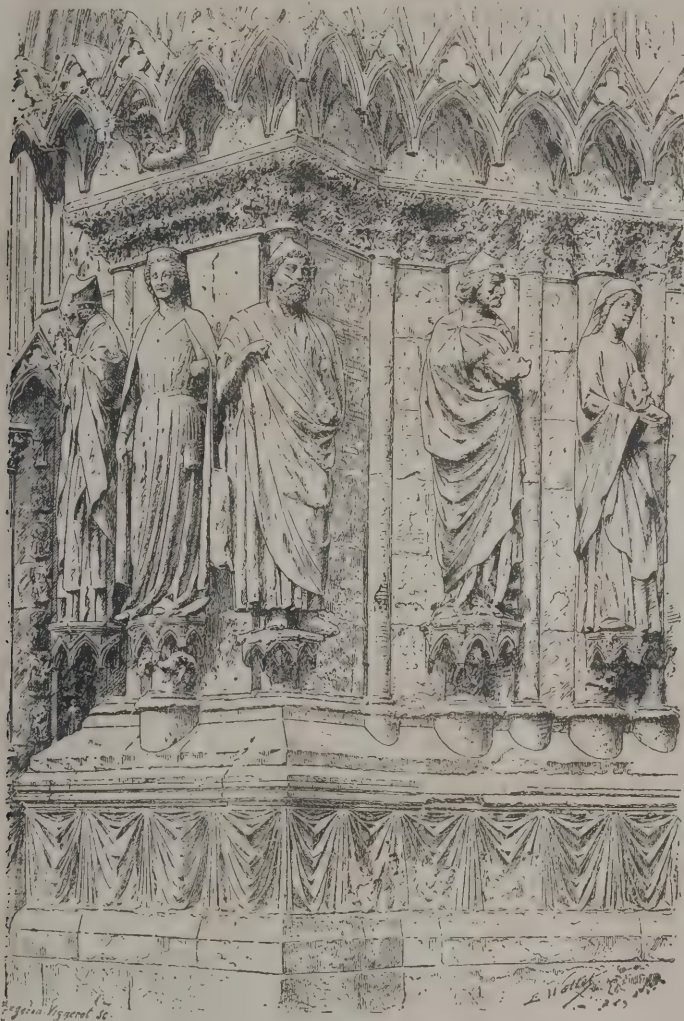


A FRIEZE. By J. B. Hüet.

FRENCH GOTHIC.*

THE history of Gothic architecture covers so wide a field as to be almost more than any one individual could attempt, and hence some writers wisely restrict themselves to a part of the history which relates to one country or one period. M. CORROYER, who is accepted by his countrymen as an authority on the subject, is therefore content to treat of Gothic as it was manifested in France. Mr. ARMSTRONG, who has edited the translation that Messrs. SEELEY has published, appears to consider that the author ought to have disregarded boundaries, and that he shows a want of "catholicity of grasp." In that opinion the *litterateur* is betrayed. Any one to whom architectural

know also that not one of the Mediæval builders called that style Gothic, or considered himself to be a Goth. But patriotism is allowed to overcome reason. Although, prior to the fourteenth century, Gothic was known in Germany as *opus francigenum*, it is granted that the claim of the Germans about their creation of the style is well founded, and in consequence of the prejudice buildings which a few years ago were accepted as so many glories for France are now as scorned as if they had been set up as trophies of an invasion. When feelings are so much disturbed it is an advantage not only for Frenchmen but for all admirers of Gothic art to have a book on Gothic by a writer about whose nationality there can be no doubt, and whose conclusions



STATUES, WEST PORCH, RHEIMS CATHEDRAL.



STATUE FROM DOORWAY, RHEIMS CATHEDRAL.

styles are more than topics for treatment in a book or journal will be always gratified to learn that a historian of architecture prescribes limits to himself and keeps to them. A *litterateur* finds it easier to take an extended view of the art from China to Peru than to describe the peculiarities of the buildings of a village; and this is seen by the number of histories of architecture for popular use which are to be found in most languages. But excellent as those compilations may be for all who need possess no more than an amateur's acquaintance with the art, they are not of much value for those who study because they are desirous to build. In no art is "viewiness" more pernicious than in architecture.

There is another advantage in M. CORROYER'S method of which Mr. ARMSTRONG could not be aware. During the last twenty years many French architects have been endeavouring to prove the importance of JULIET'S question to herself, "What's in a name?" They know that the progress of the style in which the Pointed arch is an element is more easily traced from southern to northern districts in France than in the reverse direction. They

are drawn from a thorough knowledge of French buildings. The relation between English and French Gothic is so close that whatever affects one must affect the other, and doubts about the origin of the style can no more be ignored in London than in Paris. Hence, it is that a writer like M. CORROYER becomes more generally useful when he adopts "a thoroughly French standpoint" than if he tried to look at Gothic buildings from a balloon in mid-air, where there were no national questions to disturb him.

It is evident that M. CORROYER was aware of the strength of the new notion, for he commences his book with a statement which is really a remonstrance with his brother architects, who are disposed to undervalue Gothic because of its supposed German origin. It is so important as coming from him that we think it right to print it:—

The term Gothic as applied to the architectural period dating from the middle of the twelfth to the end of the fifteenth century is purely conventional. The expression is clearly misleading, as indicating the architecture of the Goths or Visigoths; for these tribes were vanquished by Clovis in the sixth century, and left no monumental trace of their invasion. Hence their influence upon art was *nil*. The term is radically false, both from the historical and the archaeological point of view, and originates in an error which demands the strenuous opposition due to persistent fallacies. By a strange irony of fate the term *Gothic*, used in the last century merely as the opprobrious synonym of barbaric, has been specialised within the last sixty years in

* *Gothic Architecture.* By Edouard Corroyer, Architect to the French Government, and Inspector of Diocesan Edifices. Edited by Walter Armstrong. (London: Seeley & Co., Limited.)

connection with that polished epoch of the Middle Ages which sheds most lustre upon our national art. And this in spite of its Germanic origin.

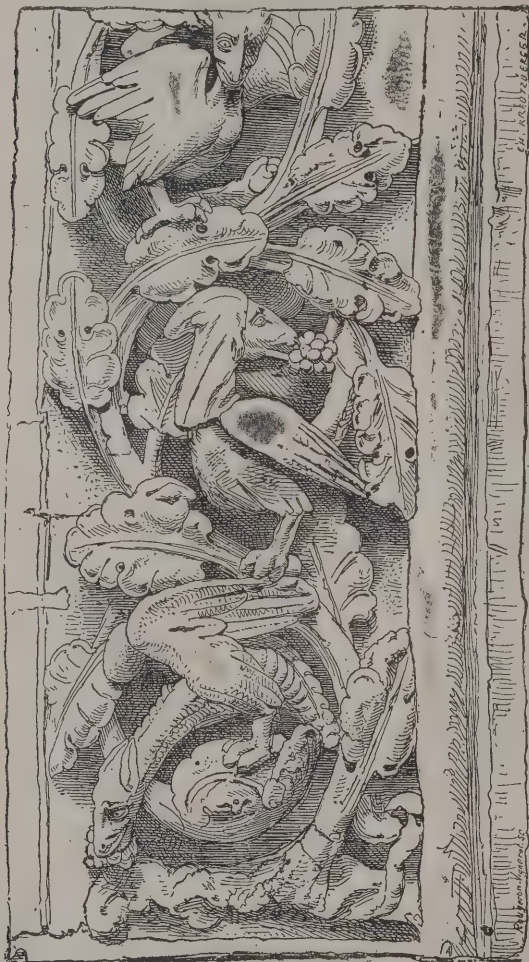
Romanesque architecture, or to be exact, that architecture which by virtue of the archæologic convention of 1825 we agree to label Romanesque, undoubtedly borrowed its essential elements from the Romans and Byzantines, modifying and perfecting them by the genius of Western Europe; but the architectural period which began in the middle of the twelfth century, and is so unjustly dubbed Gothic, was of purely French birth; its cradle was the nucleus of modern France. Aquitaine, Anjou and Maine were the provinces in which it first took root. The royal domain, and notably the Ile-de-France, witnessed its most marvellous developments, and it was from the very heart of France that its splendour radiated throughout Europe. But the tyranny of usage leaves us no choice as to the title of this volume. We are compelled to style it Gothic architecture, though we would gladly have registered our protest by naming it French Mediæval architecture.

When it is remembered that M. CORROYER was appealing for a renewal of interest in Gothic, the claims he makes for the style are only reasonable. But Mr. ARMSTRONG detects in the words the spirit of chauvinism. And then he goes on to inform M. CORROYER and the readers of the transla-

writers throughout the year in a form which involves no responsibility. Fortunately for all parties the Editor does his note-making gently; the first specimen of it is almost the last, and therefore we need no longer delay the consideration of M. CORROYER's book.

It is rare to find a volume of the size—that is, containing about four hundred pages, of which many are occupied with illustrations (two hundred and thirty-six in all)—which contains not only so much information, but such an exposition of principles. M. CORROYER never forgets that he is an architect, and that his business is to write for fellow-students, young and old, about their Mediæval predecessors. He does not stray into legends or emotional subjects; he is not satisfied with applying epithets to a building and calling it grand, glorious, refined, well-proportioned, &c.; his aim is to discover why it is worthy of being so qualified. What he says is always expressed plainly and in few words.

M. CORROYER divides his book into four parts, viz. Religious Architecture, Monastic Architecture, Military Architecture (including gates and bridges), and Civil Archi-



SCULPTURE, DOORWAY, NOTRE DAME, PARIS.



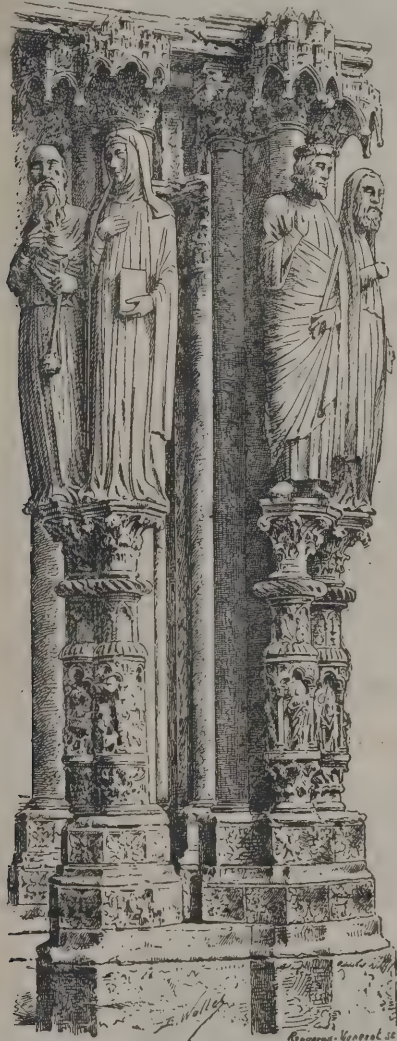
SCULPTURE OF ARCHIVOLT, NOTRE DAME, PARIS.

tion that "art activities in the Middle Ages were as instinctive and unconscious as speech; the forms of architecture were invented and elaborated much in the same way as language." We wonder, would Mr. ARMSTRONG also conclude that the types used for his note were set up unconsciously and instinctively by the compositors? Yet type-setting is more allied to speech than the setting of stones in a wall. But what are we to say to the setting of stones in vaulting? If Mr. ARMSTRONG will try to discover what a vault really is—it will not be an easy work for him—we have hopes that he will see the folly of his unconscious and instinctive theory. As regards his assumption of a resemblance between word-making and building, it reveals that he is no more of an expert in philology than in architecture. If we assume certain differences in the construction of the ear and of the lips of races of men, we can understand how bhu became phuo, baula, bau, be and build; but what physical or mental organisation compelled men to substitute ogival arches for semicircular arches? There is no use in blaming Mr. ARMSTRONG; he simply puts his name to statements which resemble those which come from other

texture. The majority of the examples are French, and rightly so; but there are also examples from Belgium, Italy, Germany and England. The author is not a believer in architectural compartments or periods; time flows continuously, and styles, like all things else, move with it; accordingly the only divisions introduced are those of centuries. Gothic, to M. CORROYER, appears as "the continuous logical development of the Romanesque movement, just as the latter in its time had been the outcome of the gradual adaptation of old traditions to new-born exigencies."

The importance attached to St. Front in the evolution of Gothic has been questioned. M. CORROYER continues to hold the old opinion, for he says that in the pendentives of that church the embryo of the groined vault is to be traced. The architects of the Ile-de-France developed the vault, and as a result the flying buttress became a necessity, then it became a snare. There is evil compensation as well as good, and the constructive science that was seen in making masonry in one form outside a building resist a different form within, led to a defiance of risks by setting, as it were, disproportionate masses to fight out problems in statics.

As RENAN says, the passion for lightness grew to be madness. On one of VILLARD DE HONNECOURT'S sketches he represents himself as competing with another architect in the production of novel and bizarre forms. In such struggles stability was jeopardised. The chances of defective materials and workmanship were disregarded. Science was expected to prevail over all forces, and yet, owing to the backward state of the mathematical sciences, it is not likely that the principles of the builders could be formulated with precision. It may appear to be heresy to say so, but there must have been much empiricism employed in the proportioning of the parts of the best Mediæval churches. M. CORROYER'S love of French buildings does not hinder him from expressing the truth about their defects; he is no idolater of weakness because it is old. The buildings are, he says, "monuments to the ingenuity of the architects, but no less are they beacons warning against the perils of a



STATUES, NORTH PORCH, CHARTRES CATHEDRAL.

rationalism—more apparent than real—which their authors carried to its extreme limits, casting to the winds all traditional principles, and consequently all authority." It is novel to find a writer with the courage to dwell on the defects of a style with which his name is identified. As a contrast, M. CORROYER points to the massive solidity of English building.

A consideration of construction alone would leave an inadequate idea of Mediæval churches. Catholicity seems to admit all moods, and to allow them scope for expression. There are dimly-lighted Romanesque buildings, which suggest that they were erected by men who were severe to themselves and to all around them. The development of Gothic was marked not only by more daring construction, but by an expression of more joyousness, as a characteristic of life and more tolerance. The clergy did not excommunicate sculptors when they were humourists in their work, or became satirical of ecclesiastical organisations. It was remarkable also that the sculptors were compelled, as it were, to keep pace with the builder. As M. CORROYER writes:—"The history of sculpture is that of architecture, for the diverse influences which marked their origin and modifications were common to both. Each reached its

apogee in the brilliant manifestations of the thirteenth century, and each followed the same path to decadence." A question naturally arises whether it was meet, just and reasonable that the two arts should have a common fate. As the architect was the controller of all the subsidiary arts, he was able to compel any one of them to a course that must end in decay. At first the sculptors employed could only carve rude figures, but as time went on there was improvement. Sculpture and painting can travel faster towards perfection than architecture, but the Mediæval architects took care to impede that swiftness; the arts were forced to keep abreast, or rather architecture insisted on going ahead. But when the mother of the arts stumbled and fell, it seemed an excess of loyalty to expect that the subsidiaries must cast themselves to earth in order that she might not be abashed. Take the figures of the west porch of Rheims. We suppose every one will agree with M. CORROYER that they show Roman influence, or a direct imitation of Roman work. There is apparent in them no element of decay arising from the overgrowth of a quality. When French sculptors were able to execute such admirable figures, it was reasonable to expect successors of still more competence. We might suppose, however, that the figures at Rheims were considered to be too sculptural, for during the Gothic period there was no effort to surpass them. Figures like those to be seen at Chartres were probably considered to be far more suitable from their rigidity. The Rheims sculptors accepted nature as a standard, and the graceful attitudes of the figures, with the flowing lines of the drapery, reveal a search after beauty which could only be possible in cases where liberty was allowed. The sculptors were not afraid to provoke a contrast between their lines and those of the building. At Chartres there is limitation. The figures are stony, as if they were men and women metamorphosed into piers. The draperies are cut out on economical principles. The sculptors went beyond nature, and imagined a race of people in whom there was no longer guile. In the ornament from Notre Dame, Paris, as in much of the sculpture in that cathedral, we see efforts to be creative; but the hybrid beings, beyond their novelty, have no qualities that would not be secured by fidelity to nature. The peculiarities may, however, be attributed to foreign influences which controlled French sculptors. M. CORROYER describes some of them:—

The influence of Roman art upon French Mediæval sculpture is unquestionable. Its course may be traced through the relations existing between North and South long before the Crusades, principally by means of the great religious communities, and even more manifestly in the countless monuments raised in Gaul on Roman models, or in those constructed by Gallo-Romans for several centuries. Many of these survived the incursions of the barbarians. The origin of ornamental sculpture is no less venerable. Superficially, it would seem to have drawn its inspiration mainly from the Romanesque epoch; but, according to modern *savants*, its source must be looked for in much more remote periods. Oriental art, imported into Scandinavia and there barbarised, was introduced into Ireland in the early centuries of our era. The Irish monks, whose power was very great, and who seem to have been the principal agents in the Renaissance of the days of Charlemagne, created or, at any rate, greatly influenced, Carolingian art by their manuscripts and miniatures. From Carolingian art that of the so-called Romanesque period was born, and this was in its turn the parent of the ornamental sculpture of the thirteenth century. In the admirably decorative character of this art we recognise the influence of an ancient tradition handed on from generation to generation, to be finally rejuvenated, invigorated, and transformed as to detail by a close study of nature, precisely as had happened in the allied development of statuary. The architects of the Ile de France, like those of Rheims, assimilated the principles of the new art with the supple skill which characterised them, such assimilation bearing rich fruit at Notre Dame de Paris in the sculptured figures of the west porch, and no less in their accessory ornaments. A most instructive comparative study is furnished by the north and south porches of Chartres Cathedral. Here we find in one building examples of sculpture inspired by the hieratic tradition of Byzantium and of those which had been transformed and naturalised by a return to antique ideals.

M. CORROYER has also a chapter on Mediæval painting, including stained-glass, which contains a summary of what is known on the subject. The second, third and fourth parts of the volume we shall notice in our next number, but we take this opportunity to recommend the book to our readers. M. CORROYER has very decided opinions, but they are founded on the widest and most exact knowledge of French buildings. English architects who have not forgotten their studies in France cannot fail, after perusing the pages, to be thankful for so much information.

JAPANESE STENCILS.*

THE Japanese have rendered us a service in England for which we cannot be too grateful. They delivered us from the plague of South Kensington ornament, which was not only ruining our manufactures but was driving designers to despair. As long as it was put forth

change in the system, and for that we must be grateful to the Japanese. One class of work has hitherto contrived to be conservative and to retain the old forms which once were orthodox—we mean stencils. Wherever there is artistic control it is seen in the simplest stencil border, which of course should show a special design. We are now referring to the stencils which are prepared



CHRYSANTHEMUMS.

under Government authority that all forms of decoration were incorrect in which there was any trace of imaginativeness, true artists could have no chance, and it is no wonder so many have turned to the painting of pictures. But the mechanical geometrising and diagrammising of the

for the use of builders and decorators, and are to be obtained at "artists' warehouses" and other shops where painters' materials are sold. The majority of the patterns are as geometric and lifeless as any inspector-general, inspector or examiner in the old days of Brompton



CHRYSANTHEMUMS AND BUTTERFLIES.

Department was not able to hold its own against the simplest strokes of the Japanese decorators. The humblest servant-girl could perceive the difference between the Eastern and Western systems when they were applied to the adornment of cotton and other dress fabrics. South

could desire. There is not much choice for a buyer, and whether he selects Classic or Gothic patterns he is sure to obtain stereotyped forms.

A stencil cutter who turned his thoughts to the work that is done in Japan would discover possibilities of



CARP AND WAVES.

Kensington was defeated ignominiously, but as the salaries continued to be paid as promptly as of yore the loss of reputation was accepted philosophically. There was a

usefulness which are unknown among us. As in all times it was necessary to turn out ornamented work quickly, the Japanese were too wise to neglect the use of stencils. Collectors will maintain that every inch of surface decoration on their examples of pottery, panels or textiles is hand-work, although from a comparison of "pairs" it is not difficult to discover where the artist worked over a ground that was stencilled. In fact, the uniformity of style which is common in the works of various districts could not be

* *The Book of Delightful and Strange Designs.* Being One Hundred Facsimile Illustrations of the Art of the Japanese Stencil Cutter, to which the Gentle Reader is introduced by one Andrew W. Tuer, F.S.A., who knows nothing at all about it. (London: The Leadenhall Press, Limited.)

kept up unless there were means available to suggest the character the decoration was to assume, and which were to insure that it would not assume another character. It will be said that the principles of their art are enough to inspire as well as to limit the efforts of the ornamentists; but the Japanese are shrewd, and they take care to secure themselves against losses through freakish efforts by various sorts of arrangements, of which stencilling of certain parts is one. With delicate lines laid down for him the artist can at once recognise where he can exercise his imagination and powers, and with what forms he is to be consistent.

The remarkable collection brought out by Mr. TUER of impressions from their 'stencil-plates' will demonstrate the

The cutting of the stencils is not a mechanical operation only, for the vigour of the lines in the design has to be preserved. Whether it would be possible for an English workman to attain so much dexterousness may be doubted, but it would be beyond the power of most of the existing stencil cutters. What is of as much importance at present is that the value of the Japanese examples as sources of inspiration should be accepted. The hundred plates which Mr. TUER has collected should open out new vistas of delightful and attainable subjects, which would give more pleasure to the designers and to the people who have to pay for stencilling than miles of such patterns as are now in use. In this class of work, as in others, the Japanese are not afraid



BAMBOOS.

elaborateness which the Japanese can obtain. Their fingers are strong and delicate; and as SALADIN was able by his dexterity to cut a piece of lace that was placed on his scimitar, it might be said that the Japanese could rival the lace-maker in cutting out the most delicate patterns from a sheet of paper or from several sheets placed together. The process employed is described by Mr. TUER:—

The artist-workman takes some half-dozen sheets of tough paper, made of mulberry fibre (*Broussonetia papyrifera*) prepared with the juice of persimmon and waterproofed with a hard drying oil. On the top he places the artist's design drawn with ink. The sheets firmly secured, he begins cutting with a long thin knife, which he pushes before him in the same way as a copperplate engraver at home uses the burin. Slowly and accurately the keen blade cuts through the little pile of paper, following the curves of the design. Where there are punctured holes or dots the knife is superseded by a fine punch, for if pins were used a burr would be formed and the design would not print clear and sharp. When the cutting-out is finished two of the sheets are damped so that they may expand, and, what is of equal importance, contract equally in drying. One is laid down flat and covered with adhesive material. The threads are then one by one put in position, the ends sticking on to the margins. The second stencil is accurately laid over the first by means of upright pins placed in the "register" holes already mentioned, the two paper plates are brought exactly together and the threads securely imprisoned. The joining of the two

to utilise an abundance of the forms that nature produces. Mr. AITCHISON, A.R.A., who is now, fortunately, accepted as a friend, philosopher and guide by the Science and Art Department, has told students "that the flora of the world is not confined to the lotus, the honeysuckle and the acanthus, and that there are thousands of beauties still to be culled from plants and flowers that now remain outside the domain of art." The Japanese artists would hardly agree with the latter part of the advice, for what plant or flower is there which they have seen and neglected to utilise? But Mr. AITCHISON's words have special significance, for every man who designs, makes, sells or uses a stencil in this country. In ornamentation that is so manifestly mechanical, and which cannot deceive anybody, surely it is not imperative that only the most severe forms should be employed. "The Book of Delightful and Strange Designs" thus merits the attention of all who are in any way engaged with decoration. The blocks which we give are reductions to one-third the scale of the plates, and therefore can hardly express all the vigour and fitness of the originals.

Mr. TUER has already enriched the public with many ingenious books. In this case he has again hit upon a subject that may well be called fascinating. To many it will



HARE AND WAVES.

plates enclosing the threads is so absolutely perfect that a strong glass fails to disclose any sign of overlapping or unevenness. That anyone but a Japanese could execute such difficult work as this is simply impossible. When the stencil cutter has got through his first pile he puts a stencilled impression on the top of the next as a guide, in lieu of the original drawing, which now has no independent existence, and he will continue cutting out the same design until he has a number sufficient for his purpose. From its nature, especially when the design is delicate and finely cut, a paper stencil-plate cannot last very long. Many of the examples in our collection have seen so much service that they cannot again be used.

be a new revelation of Japanese art, and the hundred examples which are given will afford a truer notion of the decorative power that is found in the Flowery Land than is obtainable from more costly works. For the "Book of Delight" would be considered cheap by students of art. There is an introduction which will horrify pedants by its pleasant style, and as it is translated into German and French, a lesson in languages is thrown in with the bargain

SOME RENAISSANCE TOWERS, AND THEIR ANCESTRY.

THE world is not quite so fond of originality as it fancies. It is always wishing to see and hear some new thing, and yet, to please it much, the thing must not be wholly new. This is true in all the arts, but in none more than in architecture. There, if anywhere, novelty, to be borne with, must show itself by degrees. It may come as a fresh idea, transforming, bit by bit, the whole system into which it has penetrated. This was what happened at the rise of the Gothic styles in the twelfth century. But it may also come as a fresh fashion, not so much altering the old as reclothing and disguising it; and this is rather what took place during the earlier and middle Renaissance. In either case, it is interesting to trace back the resulting types to their origins; and in doing so we may get useful hints for our own attempts at the original. We shall find that the types which have succeeded are usually the types that have been developed, and that an architecture without ancestry is likely to be an architecture without posterity.

The City churches, rebuilt after the Fire of London, belong, of course, to the later Renaissance. It is not so obvious with them as with analogous buildings a century older that they are only Gothic in disguise. Their detail, for the most part, is severely Classic, and it is mainly in the planning of the churches and in the general composition of the towers that we find traces of their true character. Let us begin with one of the most familiar—the tower of St. Magnus, London Bridge. Its lower stage, above the pediment from which it springs, is plain and square. The next storey is also square, but relieved by coupled pilasters on each face next the corners. Then comes a cornice and balustrade, and above this a tall octagonal lantern, with pilasters at its eight angles. The balustrade does not run round without a break. On the contrary, it is stopped at each corner by projecting pedestals, carrying large vases. These, on the angular view, fill up the sudden break from the square to the octagonal plan, and round off the outline gracefully. The lantern is covered by an octagonal dome of pointed section; and from the top of this springs a slender *fleche* or spirelet, which terminates the composition. Altogether it is a satisfactory piece of design, and it was probably considered when built to be as novel as satisfactory. In a certain sense it was so; in a certain sense there is freshness about it still, and it rather increases than lessens our admiration for the great architect who designed it to know that he produced this effect of freshness and originality with what we may fairly term “old materials.”

Like all WREN's best towers, that of St. Magnus has what is known as a “lantern.” Where did the idea of a lantern-tower first come from? We may trace it back from our own seventeenth-century examples to earlier Renaissance ones abroad; from these to the almost innumerable Gothic ones, and from these again to Romanesque and primitive Romanesque specimens, as old in some cases as A.D. 1060. That, perhaps, is about as far as we can go in Western Europe. But, as it has happened with so many ideas, the germ seems to have come first of all from the East. The lantern-tower was originally what its name denotes, a tower pierced for light. It was in the first instance a structure meant to surmount the “crossing” of a church, as in many cases it still does. Its square base was originally low and insignificant—an unavoidable necessity because of the four arches which carried it, but a necessity which those who first used it would gladly perhaps have got rid of. So we find it at the Theotocos, Constantinople, and at the Metropolitan church, and the church of St. Taxiarchus, Athens. The Theotocos lantern springs from the square with “broaches” or weatherings of low pitch. It is circular on plan, but is surrounded with an arcade of twelve bays, pierced with windows. It is attributed to the ninth or tenth century. At St. Taxiarchus the lantern is octagonal likewise, on a short square base. The Romanesque lanterns of Italy, though later in date, seem closely allied to these. Such, for instance, are those at Parma Cathedral, at the cathedral of Caserta Vecchia, at Pavia, and at San Ciriaco, Ancona. The German Romanesque ones make no great advance on the early Italian. We find them at Laach, at Spire, at Worms, and elsewhere. But when we come to France new lines of pro-

gress at once show themselves, and the type, which was nearly at a standstill elsewhere for three or four hundred years, is seen to be rapidly transforming itself into the perfect lantern-tower. It is now that we begin to find it on a high, square base. It is no longer confined to the point for which it was first intended—the centre of a church, the intersection of the principal and lateral avenues. It takes possession of the bell-tower, and shows us how beautiful that feature may be made.

That is the ancestry of the lantern-tower idea. There is no need to follow it through the Gothic period, or to chronicle its endless group of relations there. The early Renaissance architects continued to use it, and very often they crowned it, as it is crowned at St. Magnus, with a dome. Was this a new idea of their own, this junction of what we are accustomed to think was a Classic covering with a Gothic type of tower? Probably not. It may have been suggested by the Byzantine lanterns of the ninth or tenth century. These were covered by domes visible outside as well as within. Internally they were hemispherical, or nearly so; externally they were segmental, or sometimes of ogee form. In this latter case the convex part of the curve is the upper one; the concave part is only a narrow piece next the outside cornice. But it is not necessary to look as far as Athens for pre-Renaissance examples of the external dome in combination with the polygonal lantern. We can find Romanesque specimens of the arrangement, both in Italy, in France and in Spain. The cathedral of Caserta Vecchia, before named, has a segmental dome of early date surmounting its octagonal lantern. The church of Notre Dame at Les Aliscamps, near Arles, has a still older tower of the same form. And even pointed domes exist as the outer coverings to Romanesque lantern-towers. In Mr. STREET's work on Spain the drawings of two very interesting ones may be found, the first at Zamora, and the second at Salamanca. The latter lantern is really circular on plan, though Mr. STREET's woodcut shows it as a polygon of sixteen sides. The campanile of St. Front, Périgueux, also terminates in a pointed dome, probably anterior by a couple of centuries to these Spanish ones.

If it were not for one or two buildings like the Baptistery of Pisa, where we find an external dome in connection with Gothic detail of the Early and Middle periods, we might be inclined to say that this feature was quite abandoned for nearly two centuries. In the later Gothic it reappeared, generally of ogee section with the concave curve uppermost. What was it that suggested these so-called “pepper-box” domes, with which everyone is familiar at King's College Chapel and in other Perpendicular works? Were they a modified revival of the Classic dome or of the Romanesque dome, or were they entirely a new invention of the fifteenth century? They may have been, as they are commonly supposed to be, the first-fruits in England of the Renaissance which had already begun in Italy. But their character and expression rather suggest that they were a fresh importation from the East, not, as in Romanesque periods, from the Christian East, but this time from the Mahomedan. The later towers of Holland and Belgium have, in many cases, a character and expression wonderfully like that of the Eastern minarets. The resemblance, of course, is not in style or detail; it is a resemblance in proportions and general composition. For example, there is a characteristic type of minaret which begins as a tall, slender, square tower. At a great height a kind of balcony, polygonal on plan and much larger than the square on which it rests, is elaborately corbelled out so as to overhang it all round. Above this balcony the tower goes on again, of a circular or polygonal plan, still more slender than the square shaft beneath. It is a picturesque arrangement, found at the mosque of Beybars, at the mosque of Mahommed el Nagor, Cairo, and elsewhere. But it is an arrangement quite unknown to European architecture down to the late Gothic period, when we suddenly come upon it in the tower of the Hôtel de Ville at Alost. So it is with other types which have the same affinities. It may have been through the extension of commerce with the Mediterranean, it may have been from the growth of a Moorish element derived from Spain; but, however we account for it, there does seem to have been a distinct Oriental influence at work, during the fifteenth and sixteenth centuries, in the towers of the Low Countries, and to some slight extent even in those of England.

The vases which fill in the four spandrels between the octagonal lantern and the square tower of St. Magnus are obviously derived from the great angle-turrets which the Mediæval builders, especially on the Continent, were accustomed to use in this position. These, like most successful devices of the architect, served two purposes—a structural and an artistic one. The structural purposes, indeed, are sometimes not one, but two. When an octagonal lantern surmounts a square tower, the oblique sides of the octagon are usually carried by corbellings or oversailing courses, running out one beyond another. Unless there is a heavy weight upon the ends of the corbel stones, where they tail into the wall of the lower tower, the weight of the oblique side would of course overbalance them. This heavy weight can be obtained in various ways, one of which is to carry the octagon low down into the interior of the square. But a more artistic way was to carry up a very large pinnacle or turret in the triangular space between the oblique side and the square angle. Its weight holds down the backs of the corbel stones, and it fills out and rounds the outline of the steeple on an angular view. Again, when the lantern-tower stands over the crossing of a church, or is in any way supported by arches, these heavy angle-turrets add greatly to its stability. Their pressure turns the line of thrust downwards, and so makes the arches beneath comparatively independent of their abutments. We have not many of these great angle-turrets in England. The western tower at Ely is perhaps our most important example. The Mediæval builders, with us, relied on other modes of construction, and inserted only a slender pinnacle to round off the contour of their lantern-towers. In this respect the vases at St. Magnus follow the English rather than the Continental tradition. They are there for ornament only, not also for use.

The ancestry of the minor details in this composition is pretty obvious. The pilasters flanking each corner of the square tower in its upper stage represent the Gothic buttresses, and so likewise do the angle pilasters on the octagon. The balustrade of course replaces the traceried or embattled parapet. The *flèche* which surmounts the dome, and which by its concave outline contrasts with it so effectively, giving an aspiring character to the whole design, is the most unprecedented thing about it. It is a bold variation on the familiar cupola, but its effect justifies its boldness.

A great deal might be written about the origin of different features in the towers of St. Mary-le-Bow and St. Bride. But there are three of WREN's smaller towers which have been less studied, and which, in their ancestry, are equally interesting. These belong to St. Stephen's, Walbrook, St. James's, Garlick Hill, and St. Michael's, College Hill. They are lantern-towers of a different type from St. Magnus, a type in which the lantern is much less in diameter than the tower beneath it. The first-named may be described as a square tower with a square lantern. This is not a very common form anywhere. There is a Romanesque example of it at Murano, near Venice, and another at Bari, in Lower Italy. The well-known tower of the Palazzo della Signoria, at Siena, also belongs to the class, but it is disguised by the great projecting gallery from the centre of which the lantern rises. The Giralda at Seville is, however, the chief example of the kind. It is too well known to require much description. For nearly three-fourths of its height it rises square and unbroken. There are in this part no buttresses and no pilasters. Till near the top of it the work is Moorish, but Moorish of a more delicate and refined sort than that of the Torre Nueva, otherwise called the leaning tower at Saragossa, now demolished or in process of demolition. The square ends with a Renaissance belfry stage and a balustrade. Inside this comes the lantern. It is square, like the work below, but not quite half as wide, and it is finished by two circular stages, each less in diameter than the stage below it. The Giralda is a very large tower, and that of St. Stephen's quite a small one. Yet the general description of the one would almost serve for the other. Both have the same tall, unbroken square as a base. Both have balustrades spaced, as regards the pedestals, in much the same way. In both cases the corner pedestals carry scrolls or vases. Both have square lanterns of small diameter, pierced by a large opening on each of the four faces, and both lanterns have pedestals and

vases to finish them at the corners. Here the resemblance ends. St. Stephen's tower is not a reduced copy of the Giralda, but it bears strong marks of being amongst its descendants. And the descent may have been direct and immediate, for so celebrated a tower as the Giralda was probably familiar to WREN from drawings, though not from observation.

St. James's 'Tower, Garlick Hill, is much like St. Stephen's. Built two or three years later (in 1683), it shows the sort of difference which one would expect from an inventive architect who had the opportunity of repeating, with improvements, some previous work. But St. Michael's, College Hill, the third of the group, has a lantern of another kind—the most successful of all. There is the same tall, bare tower to begin with, and the same balustrade at top of it. But the lantern is now an octagonal one. It is small in diameter, standing far within the outline of the square which supports it; and thus it differs materially from the wider lanterns of St. Magnus and St. Mary-le-Bow. Even in the Middle Ages, these octagons of reduced diameter, surmounting a square tower, were the exception rather than the rule. There is a fine late Gothic example at Toledo Cathedral, another at Segovia, and others scattered here and there in Italy. The great difficulty in designing them seems to be the effect on an angular view. Seen from a point facing any side of the square, they are pleasing and graceful. But when the eye is opposite the diagonal, the corners stand out too far, the octagon looks too small. There is a violent break in the contour, and the upper part of the design hardly seems to belong to the lower part. So it is to some extent at St. Michael's; and so, indeed, in a much less degree, it is at Bow. The former lantern consists of three stages, all either circular or octagonal, and each more slender than the one below it. We may suppose this to be a variation on the Giralda theme, by substituting round or polygonal stages for rectangular ones. But it is worth remarking that we have in England a curious Perpendicular tower—and one which WREN was probably acquainted with—similarly consisting of a small octagonal lantern rising out of a larger one, and that out of a square. This is at Sutton, a few miles from Ely, on the road to Huntingdon. There are few examples of the kind, and this one, different as it is in detail, may yet have had some share in suggesting the graceful steeple at College Hill.

THE BRESSA PRIZE.

THE Royal Academy of Sciences of Turin, in accordance with the last will and testament of Dr. Cesare Alessandro Bressa, and in conformity with the programme published December 7, 1876, announces that the term for competition for scientific work and discoveries made in the four previous years 1889-92, to which only Italian authors and inventors were entitled, was closed on December 31, 1892. The Academy now gives notice that from January 1, 1891, the new term for competition for the ninth Bressa Prize has begun, to which, according to the testator's will, scientific men and inventors of all nations will be admitted. A prize will therefore be given to the scientific author or inventor, whatever be his nationality, who during the years 1891-94, "according to the judgment of the Royal Academy of Sciences of Turin, shall have made the most important and useful discovery, or published the most valuable work on physical and experimental science, natural history, mathematics, chemistry, physiology, and pathology, as well as geology, history, geography, and statistic." The term will be closed at the end of December 1894. The sum fixed for the prize, deducting the income-tax, will be 10,416 francs (ten thousand four hundred and sixteen francs).

The person who intends to concur at the competition must declare it within the time above mentioned, by means of a letter addressed to the President of the Academy, and send the work with which he concurs. The work must be printed; manuscripts are considered as nothing. The works of the concurrences which do not obtain the prize will be returned to them, when asked for within six months from the adjudication of the prize. None of the national members, resident or not resident, of the Turin Academy can obtain the prize. The Academy gives the prize to the scientific man considered most worthy of it, even if he has not presented himself at the concourse.

The Contract for the restoration of Toddington Church has been secured by Mr. L. Giddings, of the Marble, Granite and Stone Works, Luton. Mr. R. W. Edis, F.S.A., is the architect.

NOTES AND COMMENTS.

A FRENCH gentleman who had survived the first French Revolution, although he dwelt in Paris, was asked what he had done at so important a time. He replied that he had lived; and no doubt he considered that was a triumph. A trade journal which contrives to exist during fifty years may also claim to have a triumph, and especially when it has had to create a *clientèle*. Our contemporary, *The Builder*, to-day celebrates a jubilee which deserves recognition on the part of journalists, and we offer our congratulations to the conductors. It should not be forgotten that it was necessary to convince builders and workmen about the advantage of having a journal to represent them; and there is no doubt our contemporary has, in return for their support, rendered them and the community many services.

THE Chapelle Expiatoire, which was erected in Paris about 1826 as a memorial of LOUIS XVI. and MARIE-ANTOINETTE, is severely monumental in character, and makes its site in the Rue d'Anjou appear as part of a cemetery. It was designed by PERCIER and FONTAINE, and as a shrine for cenotaphs it must be considered a successful work. Although a memorial of an act that at the time was considered righteous, the chapel has become obnoxious to advanced Republicans, and its demolition was agreed to last week in the Municipal Council. If the site were required for some public building, there might be some excuse for the proposal, but the chapel is to be superseded by a bust of LEPELETIER DE SAINT FARGEAU, "enfant de Paris," who was killed in the neighbourhood. As an example of architecture the building deserves preservation. Fortunately the sanction of the Prefect of the Seine has to be obtained, and probably he will consider that the taxes could be expended more wisely than on demolition of monuments.

It is desirable that the superior Courts should give a decision on the liability of builders to pay "grinding money." The magistrates of the metropolitan police courts are evidently divided in opinion on the subject. If an employer belongs to the Central Association of Master Builders and accepts the rules about the payment of an hour's wages on account of "grinding money" it is a tacit agreement, and he must expect that a magistrate will be against him in case of non-payment. But supposing a member does not read the rules on the subject, is he to be compelled to pay the money? A decision given on Monday by Mr. DENMAN would sustain an answer in the affirmative. Several carpenters claimed 9½d. each from Mr. STONE, of Wandsworth. He declared that when he engaged the men there was no reference to the rule, and that he was not acquainted with the practice. The magistrate, however, concluded that the rule as to the payment of an hour's wage in lieu of notice was adopted by the defendant with a full knowledge of the terms of the association. He therefore made an order for the payment of the amounts claimed. It may be reasonable, as Mr. DENMAN said, that carpenters should have an hour to put their tools in order, although the practice does not prevail in other trades, but it would be well to have a judge's assurance to that effect. We hope, therefore, that arrangements will be made to have a test case brought before the High Court.

A THIRD edition of the "Handbook of Regulations and General Information" has been issued by the Royal Commission for the Chicago Exhibition. It contains useful information about all departments for exhibitors and visitors. Many traders with America will also be glad to have the careful abstract of the MCKINLEY tariff, which has caused much inconvenience in this country. The report on the progress of the British section is brought up to the end of the year. According to it the space to be occupied by Great Britain and the Colonies in the buildings and grounds will probably amount to more than 500,000 square feet, of which about three-fifths will be occupied by Great Britain. This is the largest area ever occupied by the British section at any foreign international exhibition. At Vienna, 1874, the space occupied was

169,827 square feet; at Philadelphia, 1876, 194,381; at Paris, 1878, 363,018; at Paris, 1889, 232,845. It is considered that the most important part of the British section will be found in the Transportation Building, in which railways, shipbuilding, &c., will be represented. In the Fine Art Department, the collection will probably be as good as has ever been sent out of the country. It is gratifying to learn that "all the arrangements for the British section are thoroughly well advanced. The allotments to nearly all the exhibitors have long since been made, in order to give them ample time for their preparations, and these preparations are in most instances well in hand. There is, therefore, no reason to fear but that the section will be, as British sections always have been, ready on the day of opening. It may be remembered that in Paris in 1889 the only foreign section which was complete was the British; it was very far advanced of nearly all the French courts. The only catalogue in the building on the opening day was the catalogue of the British section." In face of the prejudice against international exhibitions on account of their unprofitableness, which has increased of late years, the Commission have succeeded beyond anticipation, and if it were not for the efforts of the members and secretary very few British manufacturers would have sent goods to Chicago.

THERE was a famous fount in Athens known as Kallirhoe. In the beginning of the century it was a subject that was very useful for contests among archaeologists and scholars. There was also mention of a fountain called Enneakrounos, and of another as Dodekakrounos. Were they different sources of supply, or did the three names designate one fount? Over those questions there has been war. PLINY supposes there were two fountains; but, from what THUCYDIDES says, it is inferred there was only one, which used to be known as Kallirhoe, and which had nine mouths. STATIUS also refers to the nine mouths, while PAUSANIAS describes Athens as having only one spring, called Enneakrounos, although there were several wells. A spot below the Olympieion was supposed to be the site, and about a mile to the west, in the direction of the Piræus, was a fountain which was considered as derived from the underground waters of the spring. According to a telegram from the correspondent of the *Standard*, Dr. DÖRPFELD announces confidently that he has discovered the spring on the road on the south-west of the Acropolis, facing the Propylæa, and leading to the Agora, or market-place. No inscription has yet been found, corroborating Dr. DÖRPFELD'S view, but he bases it on certain objects, including pipes soldered with lead, fragments of marble, and other indications, which he attributes to the age of PISISTRATUS, in the sixth century B.C. According to some old scholiasts the famous "tyrant" erected an ornamental structure over the spring.

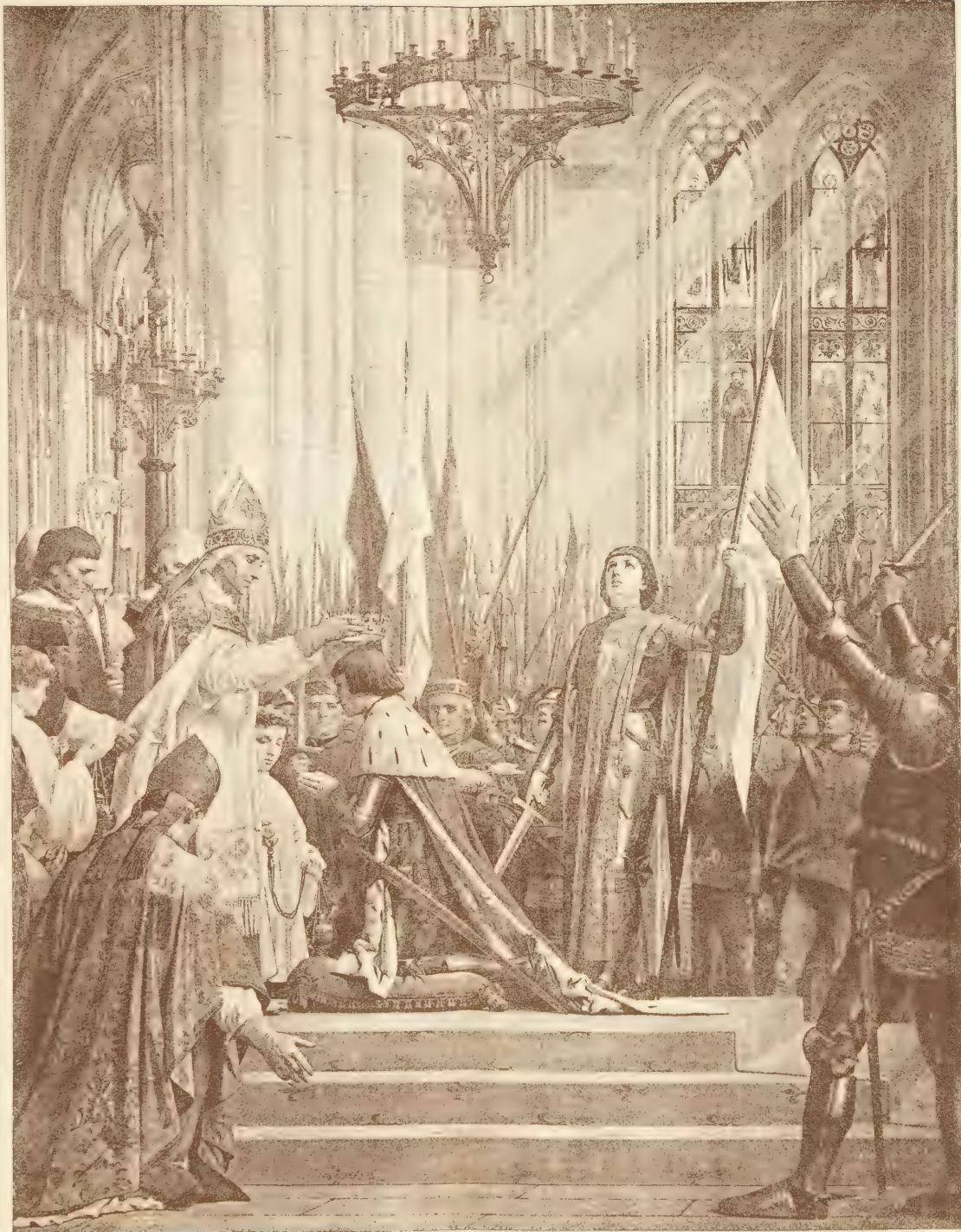
THERE are many people in France who believe that there should be only one great exhibition of works of art in the year, and that all rivals of the Salon merit suppression by the Government. As long as the Committee of the Société des Artistes Français endeavour to become more exclusive and privileged, it is not likely that any Minister dare give his countenance to their ambition. The latest effort was to abolish the right which every artist who had exhibited a work in the Salon possessed, and by which he was allowed to vote in the elections for the committees. It was considered that the aims of the gentlemen who wish to rule with strong hands would be advanced if only those artists who have exhibited during five years or who have received rewards were allowed to have the privilege of voting. The members of the Société have of late so meekly complied with all demands of the committee, it was of course anticipated that the proposal would be accepted. But for once there was resistance, and by a majority of a hundred the right to vote was preserved to the majority of the members. It must be said they are hardly worthy of the suffrage. They have permitted the committee to become absolute and to act as masters, and if there is an endeavour to restrict the voting to one *clique*, it is only the natural consequence of the exercise of unrestrained power.



ROUEN

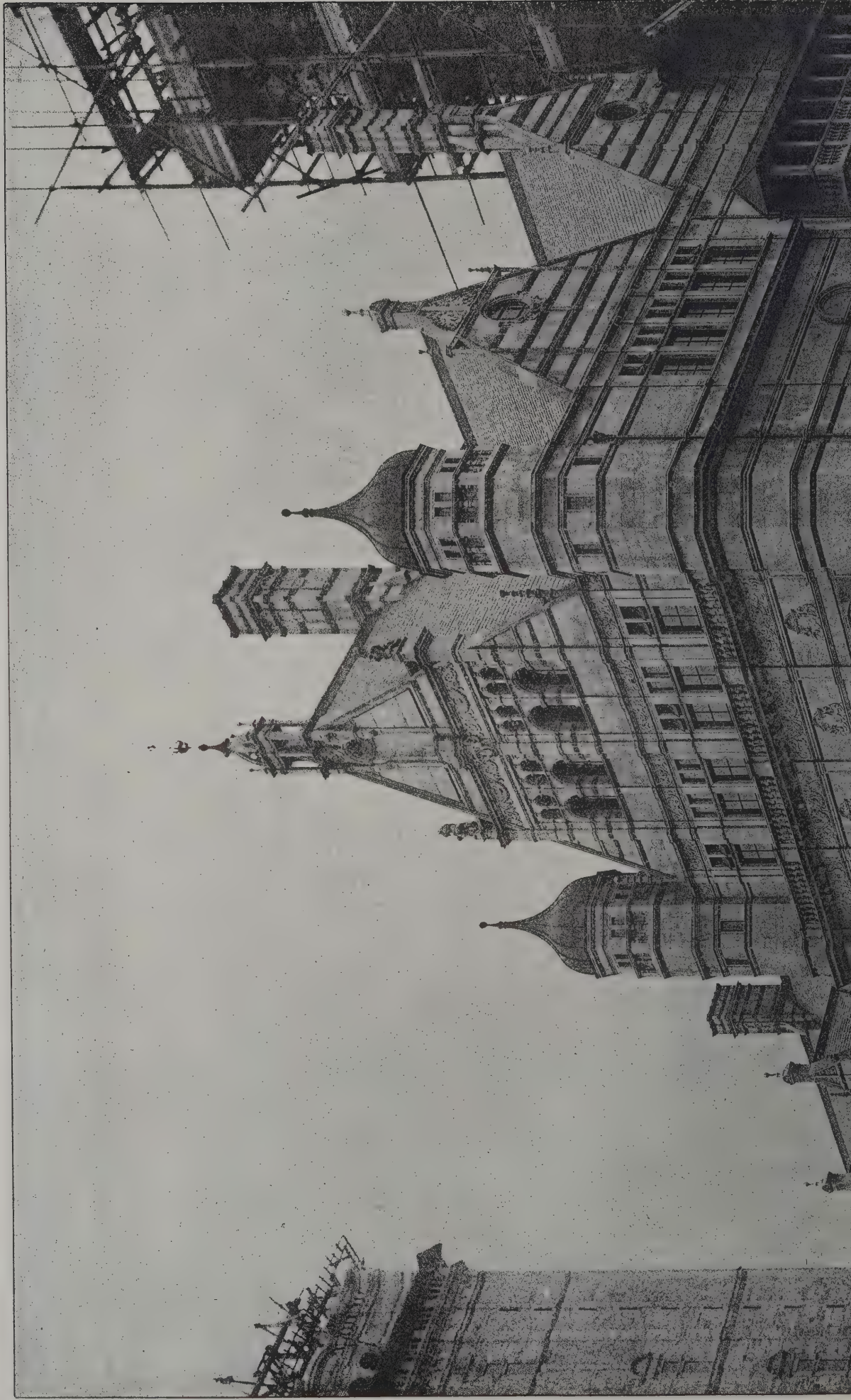
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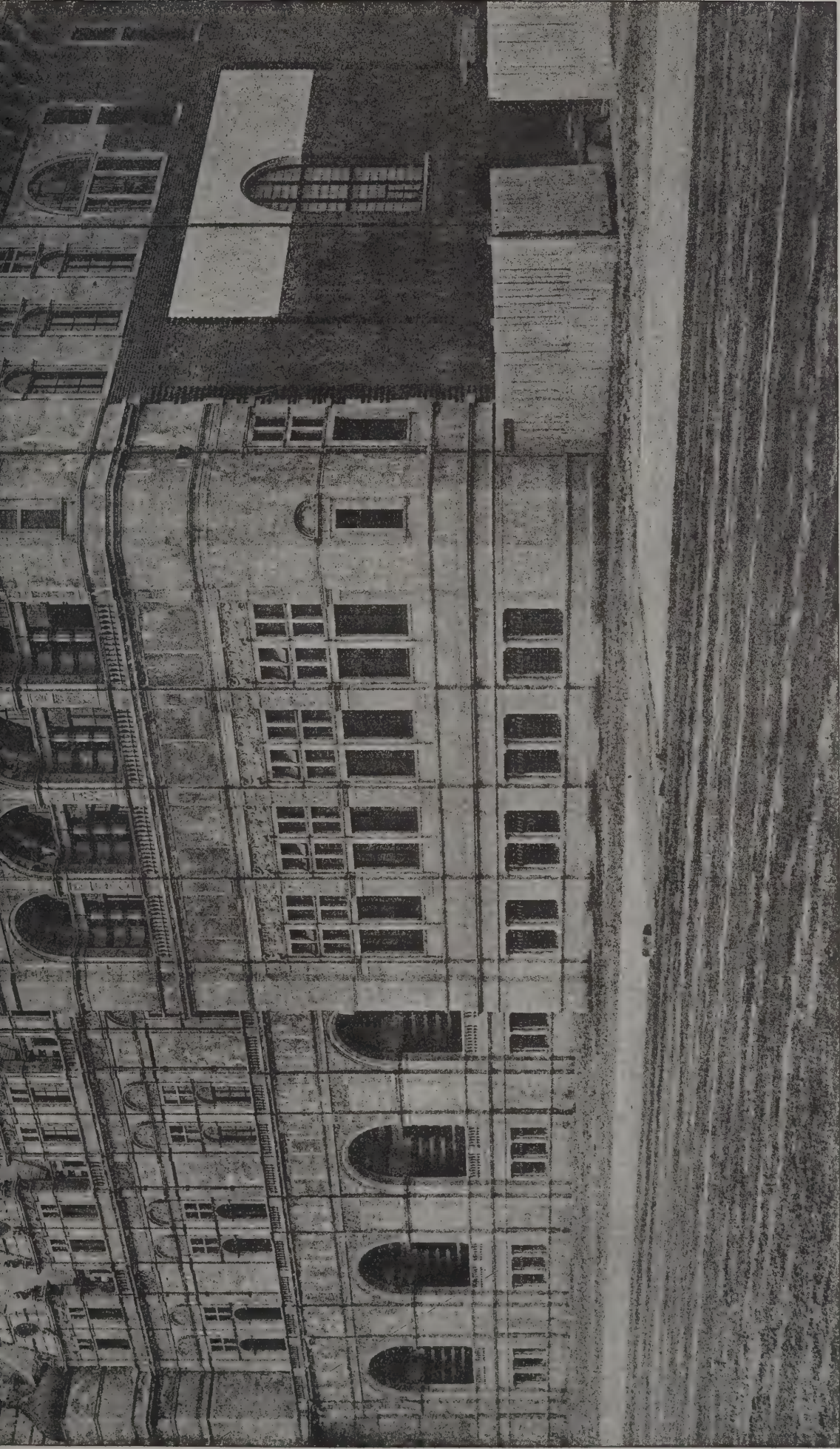
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STORY OF JOAN OF ARC.
Painting by Monsr. Jules Eugene Lenepveu

The Architect, Jan. 6th 1893.

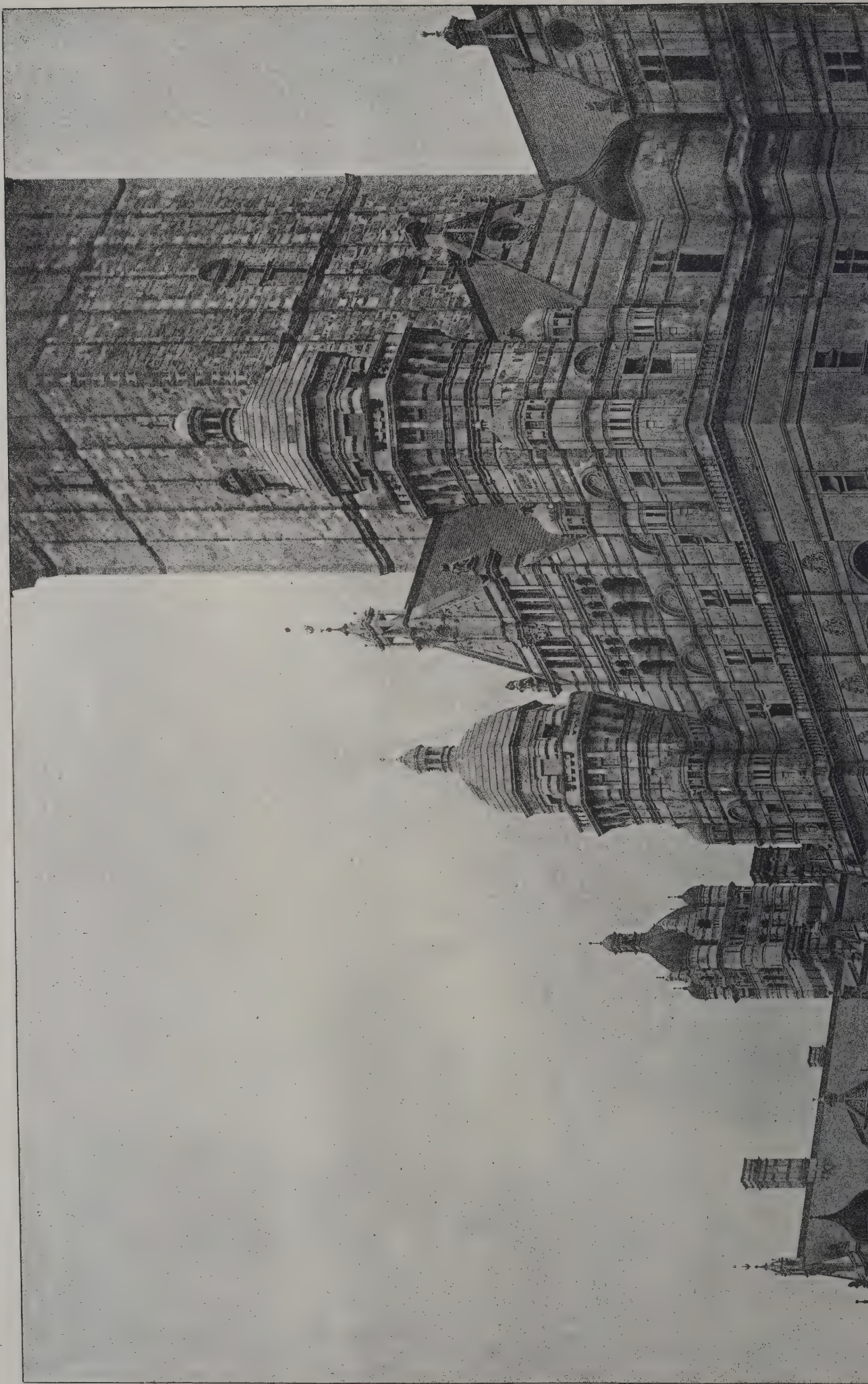




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THE IMPERIAL INSTITUTE, SOUTH KENSINGTON.
T. E. COLLCUTT, Architect.

The Architect, Jan. 6th 1893.





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ILLUSTRATIONS.

THE IMPERIAL INSTITUTE, SOUTH KENSINGTON.

WE published a view on a large scale of Mr. COLLICUTT's design for the Imperial Institute after the competition. It will be interesting to compare it with the photographic views of the parts of the building which we publish to-day. For it will be seen that the architect has made alterations in detail, and the pains which have been taken suggest one of the causes of Mr. COLLICUTT's success. The sculpture, which was an element of the design, has yet to be introduced, but, in spite of its absence, the building may be pointed to as a sign that architecture still is a living art in England.

THE HISTORY OF JOAN OF ARC.

WHEN it was decided to have the walls of the Panthéon in Paris painted by the foremost artists in France, the intention was to illustrate the history or legends of St. GENEVIÈVE, to whom the building was dedicated at the time. Soon afterwards the painters were allowed to have more scope in the selection of the subjects. If M. PUVIS DE CHAVANNES and M. JEAN PAUL LAURENS kept to the traditions of the patroness of Paris, who lived in the fifth century, M. LEVY selected CHARLEMAGNE, the restorer of order in the eighth century, as his subject, while M. CABANEL depicted scenes in the life of St. LOUIS, the representative king of the thirteenth century. The illustration we publish this week shows that M. LENEVEU has taken events of a later period, that is, the tragedy of JEANNE D'ARC, of which the final scene was gone through in 1431. Far apart as were the transactions which are represented in the Panthéon, most of them unite in revealing the power which faith in the unseen exercised at different times among the French people. GENEVIÈVE, CHARLEMAGNE, LOUIS and JEANNE were alike confident that they were inspired to undertake most difficult duties, and were to have more than human help to support them against their opponents.

M. LENEVEU in his paintings is careful to suggest a condition of mind in JOAN which may be called ecstatic, and is exhibited in three states. The pained expression which denotes her great fear when the mysterious voices were heard ("et primâ vice habuit magnum timorem") is contrasted with the satisfaction which was felt when CHARLES was crowned, and with the hope that afterwards was able to overcome the terrors of the martyrdom. It must be said that of late years French artists are rather indifferent to the portrayal of emotions, and many of them would have painted a similar series of scenes without troubling themselves about the manner in which JOAN's features were moved by her feelings. M. LENEVEU is so thorough in his method he could not pass lightly over any detail, and as he has spared no pains to be exact in costume and accessories, he has likewise endeavoured to reveal to his countrymen not only the appearance of the peasant girl in the periods of inspiration, struggle, triumph and martyrdom, but also the enthusiasm by which deeds were accomplished which were a puzzle to her contemporaries and are incomprehensible to people of a later time.

Political events have of late years surrounded the memory of JOAN OF ARC with a novel interest. As she was born in Domremy, which is in the valley of the Meuse in Lorraine, JOAN has been accepted as representing the grief which has made many Alsatian women wear black, and the desire to revenge the losses of the last war which prevails among Frenchmen. Accordingly an equestrian figure of JOAN has been set up in Nancy, and she is represented as if leading her countrymen towards the captured provinces. If the morals of the heroine of Orleans were no better than those of Mdle. THÉROIGNE, who led the women of Paris to Versailles and captured the cannon of LOUIS XVI. (she also had her martyrdom, for she was driven mad through a fustigation by her countrywomen), JOAN would still be accepted as the genius of militant patriotism. Many of the people who lay wreaths on the figures of JOAN in Paris and Nancy may be as sceptical about her virtues as was the Bishop of Beauvais or MONSTRELET or VOLTAIRE, or the author of the first part of "King Henry VI." Are they to be blamed? In a case where so much is doubtful we must tolerate many interpretations. The more the circumstances

are investigated, the more difficult is it to draw a conclusion.

With the evidence relating to the astonishing events which occurred in France before him, a man is likely to judge of the character of JOAN OF ARC according to his own idiosyncrasy, and make the history serve any theory he may wish to set up. Thus it is that M. MARIN, after an exhaustive study of the contests, concludes that JOAN was possessed of military genius. Herr MAHRENHOLZ, on the other hand, maintains that all she performed was dictated by an inferior officer. M. LESIGNE concludes, after his researches, that JOAN was not consumed in Rouen, but married a noble and brought up a large family in happiness. M. SIMÉON LUCE believes she was an agent of the Franciscans, while M. CHAPOTIN asserts that she was controlled by the rival order, the Dominicans. If the history related to an earlier time and a different country, it would be called mythic. It would be well if the darkness were more generally accepted by the French. It now suits them to utilise the fame of JOAN OF ARC as if she were an Alsatian in revolt. At another time she may be turned to account against the English, who are supposed to have been her executioners. Yet, if there is any truth in the records, her most bitter enemies were Frenchmen.

It would be out of place to attempt here any new theory on the subject, but a few notes may be given from the records of JOAN'S trial (they have been reprinted in five volumes, with notes by M. JULES QUICHERAT) and other sources, which will help to explain M. LENEVEU'S series of paintings.

JOAN was born on the festival of the Epiphany in 1412, and was the child of JACQUES D'ARC and ISABELLE ROMMÉE, who were peasants. According to MICHELET, her Christian name was really JEAN, after the Evangelist, and because a descendant of her brother in 1612 called himself DARC, some assume that was the surname. The Dukes of LORRAINE, including the little village of Domremy, were generally found among the allies of the French kings when they were at war, but at other times the Dukes fought against France. In the beginning of the fifteenth century, Lorraine, although surrounded by English and Burgundian troops, was faithful to the House of Valois, that then was nearly overthrown. The battle of Agincourt was fought in 1415, that is, when JOAN was three years old. CHARLES VI., who was driven mad by his calamities, died in 1422. His successor, the Dauphin, was not the kind of ruler that could rescue France from the English troops. The reality was terrible. Intelligence of the defeats, we suppose, reached Domremy in an exaggerated form, and could hardly fail to excite an impressionable girl like JEANNE D'ARC. Her parents' cottage was near the village church, as is seen in the painting. The sounds of the bells gave her extreme pleasure. There was also a remarkable beech tree beside her home, which was supposed to be in some way connected with the fairies, and it was referred to at her trial as a scene of superstitious acts on her part. JOAN occasionally kept her father's sheep, but most of her time was spent inside the house. M. LENEVEU represents her as holding a distaff, for, when describing her youth, she declared before her judges that she was not afraid of competing in spinning and sewing with any of the women of Rouen ("nec timebat mulierem Rothomagensem de nendo et suendo").

It was in her thirteenth year that JOAN appears to have had the first of her mysterious manifestations. On her right side a light arose, and a voice advised her to be good, and to frequent the church, and also announced that she was at a future time to visit France. Subsequently St. MICHAEL appeared, as is represented in the painting, and informed JOAN that St. CATHERINE and St. MARGARET, who are shown above, were to be her guides. These visions continued for four years, and she was silent concerning them. It was testified that in no way was she made vain by them. In 1429 she was told the time for the delivery of France had arrived, that she was to visit the Dauphin at Chinon, and ask for troops to raise the siege of Orleans. When she expressed fear, it was said that if Sir ROBERT DE BAUDRICOURT were applied to, he would give her an escort to bring her to CHARLES.

Accompanied by her uncle, she went to BAUDRICOURT, who had JOAN exorcised. Then she was sent to Nancy, to the Duke of LORRAINE. Eventually, she found.

her way to the Court at Chinon. The story about her recognition of CHARLES amidst a crowd is well known. DE QUINCEY considers the whole affair was a mere trick of legerdemain, such as may be seen any day for a shilling, and he says he was surprised to hear SOUTHEY owning a secret bias in favour of JOAN, founded on the detection of the Prince. Prejudiced as was the writer of "Henry VI.," he took a more worthy view of the transaction, and it would appear from the evidence at the trial that there was no collusion at Chinon. Besides, JOAN was sent to Poitiers, and there for three weeks was subjected to all the examinations which were supposed to be efficacious in detecting impostors. The reports of the inquiry at Poitiers are lost; but as JOAN at her trial repeatedly referred to them, they must have been in her favour. The ecclesiastics decided that the Dauphin might lawfully employ her services. CHARLES gave her a suit of armour; from the Duke of ALENÇON she obtained a black war-horse. For the sword she ordered a search to be made in the church of St. Catherine at Fierbois. The banner was made according to instructions given by the voices. It was of white linen, on which images of CHRIST and the Blessed VIRGIN were painted, with the crown and lilies of France. M. LENEVEU follows these details. The banner seemed to exalt her spirit; with it in her hand she rode about the camp at Chinon. In "Henry VI." JOAN professes to be changed in appearance after one of her visions:—

And whereas I was black and swart before,
With those clear rays which she infused on me
That beauty I am bless'd with which you see.

The lines express the tradition as it was known after a couple of centuries; but according to the evidence JOAN was swart, short and active—"erat brevis quidem staturâ, rusticanâ facie et nigro capillo, et toto corpore prævalida"—the sort of girl that was to be seen in many peasants' cottages. She was not, however, unfeminine, for, like CORDELIA, her voice was soft, gentle and low—"vocem mulieris habet ad instar gracilem"—and to the youths in the army she seemed to be something divine.

JOAN appeared before Orleans on April 12, 1429. LINGARD, who believes she was the victim of a delusion which, however, nerved and elevated her mind, says that care was taken by the French to communicate her history with due exaggeration to the English who were besieging the city. The men concluded she was either an impostor or a sorceress, and became as afraid of one as of the other. There were two tasks before the French. The first was to throw supplies into Orleans, where there was famine, an operation that was successful, apparently without loss of life, owing to the terror which JOAN's name inspired. The second was to compel the English to depart. JOAN's tactics, as described by herself at her trial, were very simple. "I told the soldiers," she said, "to boldly enter among the English troops, and I also entered boldly." About sixty temporary fortifications had to be conquered, and there were ten days of fighting before the siege was raised. TALBOT and SUFFOLK invited a renewal of the contest outside the walls, but JOAN would not allow the French troops to leave Orleans. The victory was completed on Sunday, and she said, "En nom Dieu, laissez-les partir, et allons rendre grâces à Dieu." How much the presence of JOAN contributed to the triumph is seen from the letter of the Duke of BEDFORD, who was the English regent. "The courage of the soldiers," he wrote, "was shaken by lack of belief and the unlawful doubt of a disciple and limb of the fiend, called the PUCELLE, who used false enchantments and sorcery."

The rescue of Orleans was the flood in the tide which, rightly taken, would lead to fortune. JOAN OF ARC, whose mission was to see the Dauphin crowned at Rheims, was eager to follow up the victory, but for a time CHARLES was dilatory. At length JOAN's advice was followed. Jargeau, Mehun, Eaugeny and Patay were attacked and taken. On July 14, 1429, Rheims was entered.

On the next day, which was Sunday, CHARLES was consecrated in the cathedral. Most historians relate that, as soon as the ceremony was over, she threw herself on her knees before the king, embraced his feet, declared her mission accomplished, and with tears solicited his leave to return to her former station. But the evidence at the trial does not recall a scene of that kind. Nor is SCHILLER'S

treatment more warranted, for, according to CARLYLE'S abstract, "Amid the tumult and magnificence of this royal pageant she sinks into a reverie; her small native dale of Arc, between its quiet hills, rises on her mind's eye, with its straw-roofed huts and its clear green sward, where the sun is even then shining so brightly, and the sky is so blue and all is so calm and motherly and safe. She sighs for the peace of that sequestered home; then shudders to think that she shall never see it more." M. LENEVEU is more true to the depositions when he represents JOAN as standing firmly while she offers her thanksgiving for what is past, and resolute to meet the future. She is not exhausted, and appears to feel that her task is not accomplished while an English soldier remains in France. That in the course of the day she talked about death with the Archbishop was only natural with a girl whose visions did not reveal her own fate.

Enthusiasm is rarely of long duration among soldiers, and it is not surprising that the officers soon after the coronation began to treat poor JOAN as one of the worst amateurs. She was not consulted about movements, but when failure occurred she bore the blame. At last at Compiègne, in May 1430, she was deserted, and taken prisoner by JOHN OF LUXEMBOURG, who was a Burgundian. Then came the turn of the men of peace. Whether inspired by heaven or hell, she was an exceptional subject, and it was the business of science to endeavour to discover the complicated movements which produced such remarkable effects. Theologians, metaphysicians, moral philosophers, devil's advocates, were all eager to take part in the analysis of the heroic girl's mind. The University of Paris, that claimed a sort of monopoly of the most interesting victims, lost no time in applying for the possession of JOAN. But the operators were not trusted by the Burgundians and their allies, for JOAN in Paris might obtain the benefit of a doubt. The English, too, were anxious that their defeat might be explained by the influence of infernal powers, and for that end it was only necessary to make JOAN out a sorceress. There was no difficulty in finding an agent. When Beauvais fell into the hands of the new king whom JOAN helped to create, PIERRE CAUCHON, who favoured the Burgundians, was deprived of his bishopric. He fled to England and became an adherent of the House of Lancaster. The archbishopric of Rouen was promised to him. It happened that the spot where JOAN was captured was near the boundary of the diocese of Beauvais. CAUCHON accordingly claimed jurisdiction over her; HENRY VI. of England also set up a claim on the prisoner. Eventually she was delivered and brought in chains to Rouen. The trial went on during four months. The Bishop of Beauvais presided, and he had the help of forty-two assessors, who represented moral theology, canon law, and civil law. JOAN was examined during five days in court and six days in prison. In a contest with dialecticians she could hardly expect to succeed, but her inconsistencies are not of account. The answers were analysed, and twelve propositions made out of them were submitted to the University of Paris. The assessors, we suppose, were associated with that learned body. At any rate, no time was lost by the University in condemning the propositions as blasphemous and heretical. On Whit Monday, in 1431, JOAN was doomed to death for apostasy and sorcery.

SAVONAROLA lost his prophet's strength under torture and signed a confession of guilt. Is it surprising that JOAN OF ARC should also reveal a human weakness, and when she thought of the fire that awaited her should lose confidence in her inspiration? She signed a retraction, and her punishment was changed to imprisonment for life. For some reason that remains unexplained she ceased to be a prisoner of the Church, and was handed over to the English authorities. Then came a revulsion of feeling. Once more the memory of the spirit voices overcame her, and she was filled with remorse at her disloyalty to her guides. JOAN spoke about her divine inspiration, and as all her words were noted, information of the change was brought to her judge. The words might easily have been interpreted as the result of delirium brought about by her sufferings, but State policy made it necessary that JOAN should pass from life as a being that was less than human.

The last scene of all has been depicted by M. LENEVEU.

with rigorous exactness. The judges were present, but their formalities on such an occasion were observed with impatience by the soldiers, who asked if they were to be kept waiting until dinner-time. The employment of a soldier to carry faggots and the raised arms of others suggest that there was a stain on the army which could only be removed by a fire like that which was about to be lighted. No cross was allowed to be borne by JOAN, but a soldier, out of pity, broke a staff in two, tied the parts together, and gave them to her. She held it, but begged for a crucifix. The scaffold was made higher than usual, in order that all might see whether the executioner was merciful and allowed the culprit to be smothered. In JOAN's case there was to be no abridgment of the torture. It is satisfactory to learn that the consolation of believing in heavenly guidance came back in that supreme hour with stronger power. She could be considerate for the monk who brought her the crucifix, and implored him to descend before he suffered through his humanity. It must be admitted that not much was gained by her execution. The power of England was not made more enduring by her absence from France. But it must be admitted that throughout the proceedings there was a regularity which was not always witnessed in State trials. The judges acted according to their lights, and for many a year afterwards in Europe and America unhappy women were burnt whose guilt appeared less manifest than that of the peasant girl of Domremy. If M. LENEPVEU's paintings will teach all who look on them to be tolerant to genuine enthusiasm in every form, the Panthéon may still be taken as a place of wise counsel.

A FLORENTINE NECROPOLIS.

THE early history of Florence will have to be rewritten says a correspondent of the *Scotsman*. When such a master of ancient Italian geography as Mr. E. H. Bunbury can tell us that "no trace of its existence is found in Etruscan times," and when the excavator's pick is constantly turning up fresh treasure-trove of the pre-Roman epoch, the historian of the city, it is obvious, must go behind his old starting point, and even then be in doubt as to whether he may not have to recede yet another step into "the dark backward and abysm of time."

In the centre of Florence stands the new Piazza Vittorio Emanuele, and in that ample square are being constructed the premises of the Simonelli firm. Sinking a cellar in this establishment, at a point near the Via degli Anselmi, the excavators had reached a depth of 4 m. 75 cm., when they came on a Roman pavement. This they removed, and found it to rest on a layer of virgin sand, in which they lighted on a vase, almost entire—in height 0.33 cm., in its greatest circumference 0.89. Its form was the usual one, conical with truncated top and bottom; its material the black, or rather blackish (*nerastra*), clay, rudely sun-dried, proper to vases of the kind. It was without ornamentation, and furnished with a handle horizontal to the top. Its mouth was almost entirely broken, but the fracture was not recent, dating (such is the conjecture) from the time of the construction of the Roman pavement under which it was found—a time, to judge from two coins picked up on the said pavement, certainly not later than that of the Emperor Marcus Aurelius. Inside the vase itself was earth mixed with ashes, and among this some fragments of bronze. Such was the precious object that presented itself to the astonished and exultant eyes of Professor Milani, who was not long in concluding that it was an "ossuario tipico e rituale delle antichissime necropoli Italiche, pre-Etrusche e Palæo-Etrusche" (a characteristic ritual bone-urn of the most ancient Italian, pre-Etruscan and Palæo-Etruscan cemeteries.)

That the "ossuario" was as little damaged as it turned out to be is due to the care of the superintendent of the excavations, Signor Montagnoli; possibly also to the expectation of the workmen that it might contain coin. As it was, the utmost caution was exercised in lifting it from its bed and in removing from its interior the earth which had become mingled with the bone-dust. In this latter process two pieces of bronze were taken out by Signor Montagnoli, which were afterwards supplemented by other two in the more careful scrutiny of Professor Milani. These were found to be parts of a *fibula* or clasp, with an undulated arch, and twisted like a rope. The presence of such a *fibula*, and the absence of the half-moon shaped razor which is an almost invariable accompaniment of the "ossuari" of men, led Professor Milani to conclude that the tomb to which the "ossuari" belonged was that of a woman. Tombs of this kind, moreover, are never isolated. Hence it is reasonable to suppose, with Professor Milani, that "la prima tomba

Italica" (the first old-Italian tomb) found in central Florence is the prelude to the discovery of a veritable "sepulcretum" or burial-place. Whether this "sepulcretum," exposed to the light of day after thirty centuries, is to be regarded as "Old-Italian," "Etruscan," or "pre-Etruscan," will put local archaeology to the test for some time to come.

Meanwhile the care imposed on the excavators in the Piazza Vittorio Emanuele must be extreme. Their task is to follow up this primary nucleus of an old Italian life-centre, and it is to be hoped that the municipality and the Legislature itself will see that no impediment is put in their way. Fiesole herself, 1,000 feet above the Val d' Arno, from which, according to tradition, Florence had her origin, can show nothing equal, in point of antiquity or interest, to this newly-found "ossuario." Should this fact be further confirmed, the history of Florence, as I have said, will indeed have to be rewritten. Treasure-trove of a scarcely less significant character had lately rewarded Professor Milani's investigations. Walled in behind the Church of San Tommaso, at the corner of the Via de' Cardinali, he came upon a bit of sculpture, carved out of indurated sand. At first it was thought to represent the armorial bearings or insignia of some ancient Florentine family, because on its exposed surface appeared a griffin rampant, of apparently mediæval workmanship. When detached from its setting, however, it was seen to be an Etruscan "cippus" (small truncated column), on which was wrought the effigy of the chief Etrurian divinity—Vertumnus, the god of the changing year, of the seasons and their productions, associated with a griffin and two lions, his solar emblems. Such a monument, very rare by itself, reflecting the style of the second half of the sixth century before Christ—a monument which, in point of art, is allied to the Etruscan cippi of the Florentine territory—might be held to have come from the neighbouring Fiesole. But an Apollo-like idol, on a *bijou* scale, of bronze, dating from about the same period, and of the same "cippiform" character, found last year in the excavations in front of the Church of San Tommaso, put it beyond a doubt that the above-mentioned "cippus" formed part of an Etruscan cemetery existing hard by. And now to-day the "tomba Italica," unearthed at the opposite angle of the Piazza Vittorio Emanuele, reinforces the conclusions already set forth. Professor Milani's report on this last "find" supplies the details just given, and, addressed to the President of the "Historico-Artistic Commission" of the Commune, will shortly be published in the "Notizie degli Scavi" (Notes of the Excavations).

ARBROATH OLD CHURCH.

THE Town Council of Arbroath have considered the opinion of the Lord Advocate and the Dean of Faculty respecting the questions submitted to them as to the restoration of the old parish church, which was destroyed by fire on November 14 last. Counsel, holding that the parish is burghal, as decided by Lord McLaren in the Glebe case, and assuming that the church could be restored without rebuilding, which would raise different considerations, were of opinion that the primary obligation to restore rests on the magistrates and Town Council, and not on the heritors. But the history of the church showed that for more than a century the upkeep and repairs had been defrayed by apportioning the expense among the proprietors of the pews and galleries, including the Town Council as owners of a gallery, and counsel were disposed to think that this rule would be followed. They were of opinion that the proprietors of pews would be entitled to have the area of the restored church allocated as nearly as possible in the same way as before, and to that extent they were entitled to be consulted in the arrangement for restoration. In this question those who held land in the parish were not in any different position from those who did not. Counsel were of opinion that the Incorporated Trades could be compelled by their trust constituents to restore their galleries so far as they were injured, but if they did not restore them they would have no right in the restored church. The new allocation of the church should be in accordance with pre-existing rights. As the state of matters which had come about was very exceptional, and the law regarding it was not well cleared up by decision, counsel strongly recommended all parties to settle the matter by agreement. In particular, while they thought the legal aspect of the case pointed to the restoration of the old state of things within the old fabric, it might well be that all interests would be better served by rebuilding. This, however, could only be attained by the harmonious action of all concerned. After discussion in the Town Council, it was resolved "that the magistrates and Town Council agree to take upon themselves the duty of proceeding with the restoration or rebuilding of the old church in accordance with the opinion of counsel to the extent that the insurance money which may be received will enable them to do so, and that a committee be appointed to confer with the kirk-session and the pew proprietors and any others having interest as to the steps to be taken for that purpose, and to report." A committee was appointed to carry the resolution into effect.

WESTMINSTER CLOISTERS AND NATIONAL MEMORIALS.



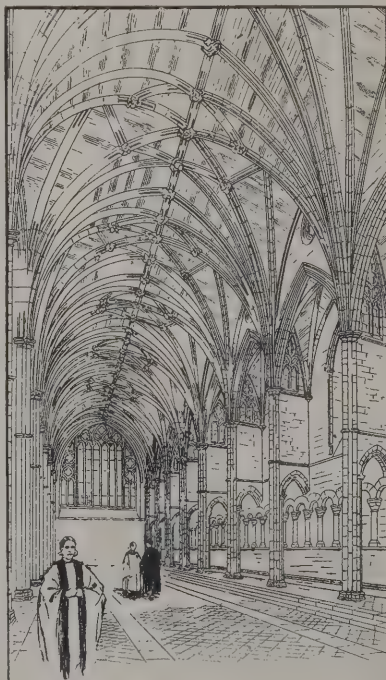
THE dead, by a simple euphemism, in Greece and Rome, were often called "the greater number," and ever since the description became a true one, the disparity between the forces of the dead and of the living has gone on increasing, until now the number of the great alone among the dead becomes too great for us to find them fit resting-place. The continuity of the national life for long centuries is one of the glories of Englishmen, and by nothing is this shown in a manner more impres-

sive upon the senses than by the splendid collection, or rather accretion, of memorials which leave a lasting memory on all who have but hastily glanced over them, and even form the principal part of the picture in the minds of such as have never had the opportunity of actually seeing Westminster Abbey.

Magnificent, however, as Westminster Abbey is, it falls short in magnitude of many buildings that cover memorials far fewer and even of less interest, and spacious as it is it has long been overcrowded. Considering the high esteem in which the building has for so many centuries been held as a burial-place of the great, it seems marvellous that its limited space should have been so squandered, as at some time it has, on memorials of men of inconsiderable importance who have thus excluded worthier successors. Such has, however, been the case, and now it is practically impossible to find place of burial here for our great men, high as is the standard of worth before we now admit that a man has a claim to so great an honour—scarcely, indeed, can the room be found for so much as a tablet of memorial.

The possibility of memorial within those parts beyond which the custom has not hitherto spread has reached its practical limits. Unless the number admitted to the honour of memorial within the Home of National Memorials is to be so restricted that the line of historical monuments, unbroken for some eight centuries, is for this and coming generations to be unduly thinned, additional space must be found, or the present limits extended.

When the matter was lately before a Royal Commission it seemed, indeed, to be thought unnecessary to discuss any possibility of being satisfied with any existing accommodation, and their attention was addressed



The Interior of Mr. Pearson's Chapel on the site of the Refectory.

almost entirely to the question of the best way of providing additional room by a new building. Where, however, should this new building be put? Several positions were suggested, each having some peculiar advantage, and between two of them the Commissioners came to no ultimate decision of recommendation.

The suggested sites (for the adaptation of some alternative plans were put forward) which principally occupied the attention of the Commissioners were as follows:—Omitting the suggested cloister of Sir GILBERT SCOTT and the transept of Mr. FERGUSSON, which in point of time came first, the earliest suggestion with which the Commissioners were concerned was that of Mr. PEARSON (based in a measure on that of Mr. FERGUSSON) for a monumental chapel, consisting of a broad central and two narrower side aisles, and connected by a low cloister with the Abbey by an entrance from Poets' Corner, a plan which would involve the demolition of several houses in Abingdon Street, and which for this reason was afterwards somewhat modified. Later Mr. PEARSON gave evidence on his suggestion for a building



on the north side of the nave, taking the form either of an additional north aisle to the Abbey, communicating with it by the west end of the nave and the north transept, or of a double cloister, enclosing a garth, and communicating in the same way. Mr. PEARSON'S preference was for the form of a new north aisle.

Next Mr. SOMERS CLARKE brought forward a plan which had been adopted by Mr. SHAW-LEFEVRE for a chapel on a site east of the chapter-house, with frontage to Old Palace Yard and entrance through the existing door in Poets' Corner.

A much larger scheme was put before the Commission by Messrs. SEDDON and LAWRENCE HARVEY for a monumental chapel facing Abingdon Street, which would be connected with the Abbey by a broad cloister, which could be built as need should arise and could be almost indefinitely extended, running along Old Palace Yard and under the buttresses of the chapter-house, to be entered from the Abbey by the doorway at Poets' Corner.

Another suggestion, in illustration of which again Mr. PEARSON produced sketches, was to build upon the ancient site of the refectory, the north wall of the new building being the south wall of the great cloisters, and the entrance

to the new chapel being through the west walk of the cloisters.

Such are some of the various suggested positions for a

the new chapel, if one were to be built, should be so closely connected with the Abbey as to form a part, an integral part of it, as much so as do the present chapels around the



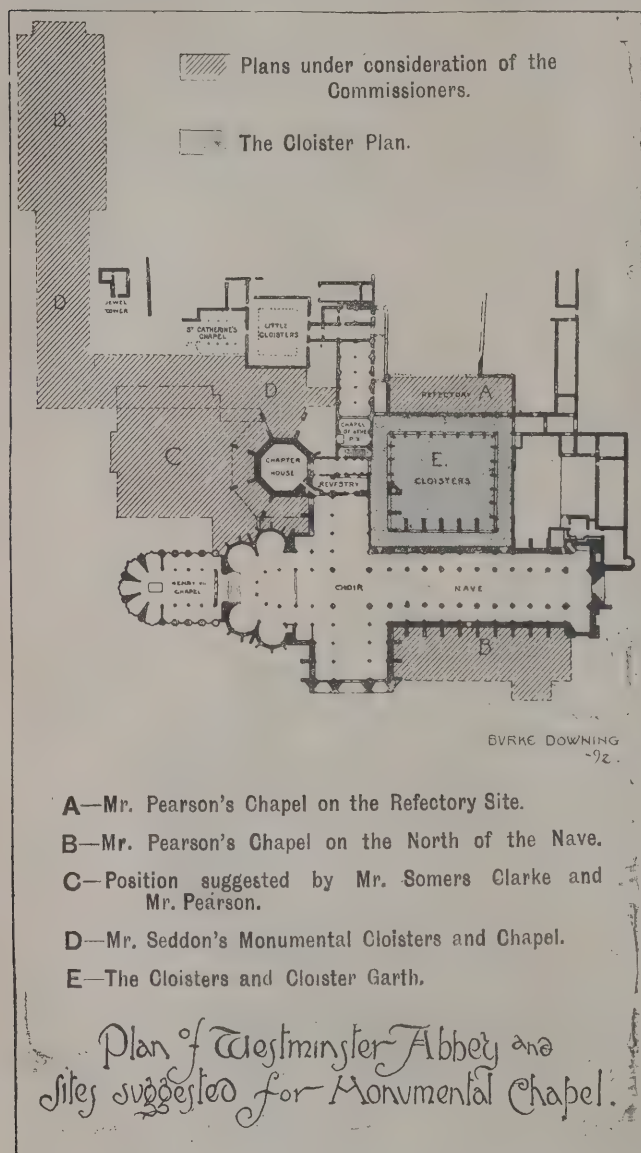
Within
the Cloister Garth
Westminster.

BYRKE DOWNING.

new monumental chapel, but to every one there seems considerable objection. The witnesses examined by the Commission seemed generally agreed, and rightly so, that

Abbey. Indeed, if this view be not taken, there seems to be no reason why the monumental chapel, if we are to have one, should necessarily be located at Westminster or close to

the Abbey. Can it, however, be said that the suggested positions would give to the new building this peculiarly close association? In most cases probably not. In two of the cases the actual monumental chapel would be at some distance from the Abbey—in the one case, in which a very imposing scheme was proposed, a very considerable distance—and the connection would be a newly-built cloister. The passage from the one to the other, it is true, would be under cover, but it would be hard to deceive oneself into the belief that one had not left the Abbey, and the difficulty would most likely be increased by the name that the cloister would certainly run the risk of acquiring—the “new addition,” or some similar phrase—and we all know



how such names live even after they have become absolutely false as descriptions.

This objection is not so strong in the case of the suggested chapel on the site of the ancient refectory. Here the site has an enduring sentiment attached to it, and it is approached by the west walk of the cloisters, between which and the Abbey itself most people, certainly, hardly make distinction in point of veneration. But the proposal for an additional north aisle is the one of all these that certainly best satisfies the requirement of close association and incorporation with the Abbey. It would undoubtedly be an integral part of the Abbey, but the interference with the structure that such a plan would involve would appear, and ought to appear, to most persons too serious to permit of its adoption.

It is clear, therefore, that to find a site for the new building would be most difficult, and this fact is attested by the inconclusiveness of the Commissioners' report. Indeed, it seems that wherever a new building is to be placed it must still be a new building; and for that reason alone for generations to come, as well as for many other reasons, a distinct building.

It is difficult to say how deeply the element of time enters into the estimation of the honour of burial in Westminster Abbey; but it is pretty certain that if this element were removed, the esteem would be in danger of going also. It is as impossible in the present day to create such a sentiment as to create a custom, and we may well fear that the sentiment that has grown up around the Abbey by time would not extend itself to any new building.

It seems, however, that the previous history of the Abbey guides us in the present case to the action that we should take. For memorial in the Abbey at first the eastern part was taken up; but gradually, as the necessity arose, the memorials and graves were taken further westward, and to the various chapels—parts less traditionally sacred being of necessity gradually occupied—until practically the whole church has been covered, and the sentiment which first attached itself to the eastern part of the church has equally extended to all parts. Should we not continue this process of gradual extension now at this stage also if we can? We have covered all the parts of the Abbey traditionally most prized, but there certainly yet remains room for a very long time for memorials (a suggestion put forward first by Mr. KNOWLES) in the cloisters. The wall-space is indeed ample for monuments for much longer than we need be at pains to provide for. Already there are in them certain monuments of much antiquity, and if we say that these are mainly to persons of minor interest, we must remember that the Abbey itself contains many monuments to persons certainly of no greater eminence or importance. From the point of view of architecture the cloisters were once among the most beautiful parts of the Abbey, and might again be restored to much beauty, greatly as they have fallen.

But principally to the cloisters are attached all the venerable associations and reverential feelings with which the Abbey is regarded, and which enter so largely into the causes of the esteem in which burial in the Abbey is held. Who, having the right of choice, would not prefer a grave under the green turf of the cloister garth, hallowed by the memories of centuries, to an interment in some new monumental chapel, however magnificent or however ingeniously fitted on to the old Abbey?

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

GRAY'S JOURNEY TO ITALY.

A SCHOLAR'S life is supposed by many people to be one of luxury. The world and its cares do not trouble him, for he hears of them as if they were abstractions. All things human appear to him not as they are in reality, but as literary subjects that are prepared in a way that may afford him a refined pleasure. Like one of the Olympian gods, he can

Smile in secret, looking over wasted lands,
Blight and famine, plague and earthquake, roaring deeps and fiery
sands,
Clanging fights and flaming towns, and sinking ships and praying
hands.

The necessity to provide food and raiment and a shelter checks many from indulging in the luxury of treating life as an affair of books; but there are men who, without being wealthy, are enabled by the agency of the founders of colleges and communities to enjoy themselves throughout their lives in that way. The author of the "Elegy written in a Country Churchyard" was one of those lucky men who are able to regard the world as a spectacle that was arranged for their entertainment. He was the son of an indolent father, who according to one account was a merchant, while others say he was a sort of money-lender. In the son the indolence assumed the form of an elegant epicureanism. Thomas Gray was placed under the care of a relative, who was a master at Eton. In that school he made friends of Horace Walpole, who was a kindred spirit, and Richard West, who might have gained distinction as a lawyer if he cared for the drudgery. The three boys seem to have had one quality in common—a fastidiousness which kept them from mingling with the rest of the scholars.

From Eton Gray passed to Cambridge, which was to be his home for life. It was characteristic of him that he considered he was superior to the dons and students of Peterhouse. "I do not know one of the people all around me," he wrote, "who inspires me with any ambition of being-like him." That sort of feeling compelled him to isolation, which had the advantage of enabling him to study his books more closely. Apparently he cared only for the classics, and was indifferent to mathematics. His friend Horace Walpole obtained the appointment of Inspector-General of the Exports and Imports, which he soon changed for the Ushership of the Exchequer. Those mysterious offices were not bars to reposing on a bench in the House of Commons, and Sir Robert Walpole considered his son could vote on a division as well as an older place-holder. But Horace did not care for Parliamentary toil. He prevailed on his father to allow him to make the Grand Tour, and Gray was invited to be his companion. In that way Gray's travels were undertaken. At the time (1739) he was about twenty-three. Horace Walpole was a few months younger.

We suppose the pair might be accepted as types of the highest class of young amateurs of that age. Horace Walpole subsequently devoted himself, as Macaulay says, "to decorate a grotesque house with piecrust battlements, to procure rare engravings and antique chimney-boards, to match old gauntlets, to lay out a maze of walks within five acres of ground" as the grave employments of his life. Gray was accepted as an authority on "painting, prints, architecture and gardening," a phrase that may have been in the late Mr. Ayrton's mind when he declared his indifference to architects and market gardeners. The "Elegy," which is accepted as his best work, suggests the character which scholarship had imparted to his mind. It has been described by critics as a piece of mosaic, but it would be more exact to say it was a mosaic that was made up with a great many which, if small, were complete. There never was a poem of the length which presents so many complete pictorial suggestions. It might be "cut out in little stars," as Juliet would have Romeo, and each would be perfect. This quality of mind is found in Gray's account of what he sees. He was not able to grasp a whole either in nature or art, and prefers to dwell upon details. That kind of vision has its use; but Gray was, like many of his contemporaries, of a supercilious turn, or, as he was described by an admirer, was curious, pensive and philosophical, and it was difficult to find any building that satisfied him.

Following the usual route from Calais to Paris, in April, 1739, he soon reached Amiens. The cathedral appeared to him as "a huge Gothic building beset on the outside with thousands of small statues, and within adorned with beautiful painted windows, and a vast number of chapels dressed out in all their finery of altar-pieces, embroidery, gilding and marble." There is not much which is characteristic of Amiens Cathedral in the description, but more remarkable is the failure of the building with the exception of the painted windows to make much impression on him. In a letter to a friend he sums up his experience of Amiens by saying, "At Amiens we saw the fine cathedral and eat *paté de perdrix*," which any unpoetic Englishman could do as well. The next place which detained him was St. Denis. It would be interesting to have a description of the church as it appeared fifty years before the devastation by the Revolutionists, but Gray's peculiarities hindered him from seeing more than the treasures which used to captivate the least instructed tourists:—

"At St. Denis, saw all the beautiful monuments of the kings of France and the vast treasures of the abbey, rubies and emeralds as big as small eggs, crucifixes and vows [votive offerings], crowns and reliquaries of inestimable value; but of all their curiosities the thing the most to our tastes, and which they, indeed, do the justice to esteem the glory of their collection, was a vase of an entire onyx, measuring at least 5 inches over, 3 inches deep, and of great thickness. It is at least two thousand years old; the beauty of the stone and sculpture upon it (representing the mysteries of Bacchus) beyond expression admirable. We have dreamed of it ever since.

It may be said in excuse that Gray, from his devotion to the classics, found a difficulty in understanding the Gothic principle, and that he could hardly help following the precedents of many fine gentlemen, who believed that Mediæval churches

were signs of the barbarism of the builders. But what is to be said about his manner of appreciating Versailles? In 1739 the palace was unlike what it is now, with masonry that is crumbling. Not more than twenty-four years had elapsed since Louis XIV. had departed from it and France, and the place must have preserved its original character as a pleasure-house. Yet Gray could discover few things in the palace or gardens to satisfy him. In writing an account of his visit to his friend West he said:—

Well! and is this the great front of Versailles? What a huge heap of littleness! It is composed, as it were, of three courts, all open to the eye at once, and gradually diminishing till you come to the royal apartments, which on this side present but half a dozen windows and a balcony. This last is all that can be called a front, for the rest is only great wings. The hue of all this mass is black, dirty red and yellow; the first proceeding from stone, changed by age, the second from a mixture of brick, and the last from a profusion of tarnished gilding. You cannot see a more disagreeable *tout ensemble*; and, to finish the matter, it is all stuck over in many places with small busts of a tawny hue between every two windows. We pass through this to go into the garden, and here the case is indeed altered: nothing can be vaster and more magnificent than the back front; before it a very spacious terrace spreads itself adorned with two large basins; these are bordered and lined (as most of the others) with white marble, with handsome statues of bronze reclined on their edges. From hence you descend a huge flight of steps into a large semicircle formed by woods that are cut all round into niches, which are filled with beautiful copies of all the famous antique statues in white marble. Just in the midst is the basin of Latona; she and her children are standing on the top of a rock in the middle, on the sides of which are the peasants, some half, some totally changed into frogs, all which throw out water at her in great plenty. From this place runs on the great alley, which brings you into a complete round, where is the basin of Apollo, the biggest in the gardens. He is rising in his car out of the water, surrounded by nymphs and tritons, all of bronze and finely executed; and these, as they play, raise a perfect storm about him. Beyond this is the great canal, a prodigious, long piece of water, that terminates the whole; all this you have at one *coup d'œil* on entering the garden, which is truly great. I cannot say as much of the general taste of the place. Everything you behold savours too much of art; all is forced, all is constrained about you; statues and vases sowed everywhere without distinction; sugar-loaves and minced-pies of yew, scrawl-work of box, and little squirting jets-d'eau; besides, a great sameness in the walks cannot help striking one at first sight, not to mention the silliest of labyrinths, and all Æsop's fables in water.

Having exhausted Paris, Gray and Walpole turned towards Italy. Gray's description of the cathedral of Rheims nearly corresponds with what he said about Amiens:—"A vast Gothic building of a surprising beauty and lightness, all covered over with a profusion of little statues and other ornaments." Lyons he considered to be "the dimmest place in the world;" Geneva appeared to him as "very small, neat, prettily built and extremely populous." The Palace of Turin he described as "the very quintessence of gilding and looking-glass; inlaid floors, carved panels, and paintings wherever they could stick a brush." He expressed disappointment that after his six months' search on the Continent he had not "anywhere met with those grand and simple works of art that are to amaze one, and whose sight one is the better for." Genoa was the first place in which he realised the charm which Italy can exert on susceptible strangers, and a week's stay appeared to him as far too short. He gave the following account of the Palazzo Doria:—

I should make you sick of marble if I told you how it was lavished here upon the porticoes, the balustrades, the terraces, the lowest of which extends quite to the sea. The inside is by no means answerable to the outward magnificence; the furniture seems to be as old as the founder of the family [Andre Doria]. The great embossed silver tables tell you, in bas-relief, his victories at sea; how he entertained the Emperor Charles, and how he refused the sovereignty of the Commonwealth when it was offered him; the rest is old-fashioned velvet chairs and Gothic tapestry. The rest of the day has been spent, much to our hearts' content, in cursing French music and architecture, and in singing the praises of Italy.

Rome was reached by the travellers a year after their departure from London. They were not disappointed in their anticipations. In a letter to his mother Gray explains the effect which a sight of the city produced within him:—

The first entrance of Rome is prodigiously striking. It is by a noble gate, designed by Michel Angelo, and adorned with statues; this brings you into a large square, in the midst of which is a vast obelisk of granite, and in front you have at one view two churches of a handsome architecture, and so much alike that they are called the twins; with three streets, the middlemost of which is one of the longest in Rome. As high as my expectation was raised, I confess the magnificence of this city infinitely surpasses it. You cannot pass along a street but you have views of some palace, or church, or square, or fountain, the most picturesque and noble one can imagine. We have not yet set about considering its beauties, ancient and modern, with attention, but have already taken a slight transient view of some of the most remarkable. St. Peter's I saw the day after we arrived, and was struck dumb with wonder. I have hardly philosophy enough to see the infinity of fine things that are here daily in the power of anybody that has money, without regretting the want of it; but custom has the power of making things easy to one.

Among the most interesting of Gray's letters is one to his friend West, in which he writes partly as an antique Roman and partly as Thomas Gray. He was growing happier, for he was on ground which had become familiar through books. Writing in May 1740, he says:—

Rome: May 1740.

I am to-day just returned from Alba, a good deal fatigued, for you know the Appian is somewhat tiresome. We dined at Pompey's; he, indeed, was gone for a few days to his Tusculan, but by the care of his Villicus we made an admirable meal. We had the dugs of a pregnant sow, a peacock, a dish of thrushes, a noble scarus just fresh from the Tyrrhene, and some conchyliæ of the lake with garum sauce. For my part I never eat better at Lucullus's table. We drank half a dozen cyathi a-piece of ancient Alban, to Pholœ's health, and after bathing and playing an hour at ball, we mounted our essedum again and proceeded up the mount to the temple. The priests there entertained us with an account of a wonderful shower of birds' eggs that had fallen two days before, which had no sooner touched the ground but they were converted into gudgeons; as also that the night past a dreadful voice had been heard out of the Adytum, which spoke Greek during a full half-hour, but nobody understood it. But quitting my Romanities, to your great joy and mine, let me tell you in plain English that we come from Albano. The present town lies within the enclosure of Pompey's Villa in ruins. The Appian Way runs through it, by the side of which, a little further, is a large old tomb, with five pyramids upon it, which the learned suppose to be the burying-place of the family, because they do not know whose it can be else. But the vulgar assure you it is the sepulchre of the Curiatii, and by that name (such is their power) it goes. One drives to Castel Gandolfo, a house of the Pope's, situated on the top of one of the Collinette, that forms a brim to the basin commonly called the Alban Lake. It is seven miles round, and directly opposite to you, on the other side, rises the Mons Albanus, much taller than the rest, along whose side are still discoverable (not to common eyes) certain little ruins of the old Alba Longa. They had need be very little, as having been nothing but ruins ever since the days of Tullus Hostilius. On its top is a house of the Constable Colonna's, where stood the temple of Jupiter Latiaris. At the foot of the hill Gandolfo are the famous outlets of the lake, built with hewn stone, a mile and a quarter underground. Livy, you know, amply informs us of the foolish occasion of this expense, and gives me this opportunity of displaying all my erudition, that I may appear considerable in your eyes. This is the prospect from one window of the palace. From another you have the whole Campagna, the city, Antium and the Tyrrhene Sea (twelve miles distant), so distinguishable that you may see the vessels sailing upon it. All this is charming. Mr. Walpole says *our memory sees more than our eyes in this country*, which is extremely true, since for realities Windsor or Richmond Hill is infinitely preferable to Albano or Frascati. I am now at home and going to the window to tell you it is the most beautiful of Italian nights, which, in truth, are but just begun, so backward has the spring been here and everywhere else, they say. There is a moon; there are stars for you! Do not you hear the fountain? Do not you smell the orange-flowers? That building yonder is the convent of St. Isidore, and that eminence with the cypress trees and pines upon it the top of Mount Quirinal. This is all true, and yet my prospect is not 200 yards in length.

The systematic excavation of Pompeii was not commenced until several years afterwards. But in 1738 an attempt was made to explore the other buried city, Herculaneum. Gray was in Naples in June 1740, and he was permitted to witness the operations. His account of the ruins is probably the first that was printed in English:—

About a year ago, as they were digging, they discovered

some parts of ancient buildings above 30 feet deep in the ground; curiosity led them on, and they have been digging ever since. The passage they have made, with all its turnings and windings, is now more than a mile long. As you walk, you see parts of an amphitheatre, many houses adorned with marble columns and encrusted with the same, the front of a temple, and several arched vaults of rooms painted in fresco. Some pieces of painting have been taken out from hence, finer than anything of the kind before discovered, and with these the king has adorned his palace; also a number of statues, medals and gems; and more are dug out every day. This is known to be a Roman town that in the Emperor Titus's time was overwhelmed by a furious eruption of Mount Vesuvius, which is hard by. The wood and beams remain so perfect that you may see the grain, but burnt to a coal, and dropping into dust upon the least touch. We were to-day at the foot of that mountain, which at present only smokes a little, where we saw the materials that fed the stream of fire which about four years since ran down its side.

Gray remained in Italy until the summer of 1741. He was disappointed with his progress in Italian and other linguistic subjects. Walpole also had disappointments. Disagreements arose, and they separated at Reggio. Four years afterwards there was a reconciliation, but they never proposed a renewal of their travels in classic lands. Gray subsequently endeavoured to study the remains of Mediæval architecture in England, and it was no easy task, for there were no trustworthy books to help him. His friends and admirers believed he had mastered the subject, and he was at least competent to rebuke another poet, who declared that the ruins of Persepolis were in the Gothic manner; but one doubts Gray's judgment when he declared that Walpole's Strawberry Hill had a purity of Gothicism in it not to be seen elsewhere. Gray's few contributions to literature have, however, merit enough to compel critics to forgive his want of judgment in archæology.

STOCK PRIZE, 1893.

THE Council or the Society of Arts are prepared to offer, under the terms of the Stock Trust, a gold medal, or a prize of 20*l.*, for competition amongst the students of the Schools of Art of the United Kingdom, at the annual competition held in 1893. The prize is offered for the best original designs for an architectural decoration, to be carried out in any or all of the following processes, *e.g.*, painting, stucco, carving, mosaic, or any other process. This architectural decoration is to be either for the side of a room or a hall, a ceiling, or the apse or side of the chancel of a church, or any suitable part of the interior of a building.

The designs must be on imperial sheets. Each set must consist at least of a coloured drawing to scale of the whole design of decoration, and two coloured drawings of details on separate imperial sheets. Mere patterns or sketches of details, without the mouldings or borders necessary to make up a complete decorative scheme, will not be taken into consideration. The designs must have been made during the previous school year.

The designs are to be submitted, with other school work, in the usual manner, to the Department of Science and Art, in April, 1893. Each of the imperial sheets forming a set of competing designs must be marked "In competition for the Stock Prize," in addition to being labelled or staged according to the regulations of the Department of Science and Art.

MULREADY PRIZE, 1893.

THE Council of the Society of Arts are prepared to offer, under the terms of the Mulready Trust, a gold medal, or a prize of 20*l.*, for competition amongst students of the Schools of Art of the United Kingdom, at the annual national competition held in 1893. The prize is offered to the student who obtains the highest awards in the following subjects:—(a) A finished drawing of imperial size from the nude living model. (b) A set of time studies from the nude living model (mounted on imperial size mounts). (c) A set of studies of hands and feet from the living model (mounted on imperial size mounts). (d) Drawing from the life done at the examination on May 11, 1893.

No student will be eligible for the award who does not pass in the examination (d) in drawing from the life, and who does not obtain an award for (a) the finished drawing of imperial size from the nude living model. The other two subjects are optional. The works must be those of the previous school year.

The drawings, &c., are to be submitted, with other school works, in the usual manner, to the Department of Science and Art, in April, 1893. Each competing drawing must be marked "In competition for the Mulready Prize," in addition to being labelled according to the regulations of the Department of Science and Art.

PRESENTATION TO AN ARCHITECT.

THE new baths in Stafford have been erected from designs by Mr. George Wormal. As that gentleman is a member of the Baths Committee of the Corporation, he could not receive any fee for his services. A testimonial was therefore subscribed, and was presented to Mr. Wormal on Thursday in last week. It may be stated, says the *Staffordshire Advertiser*, that the committee who have had the matter in hand were the deputation who, as delegates from a town's meeting, waited upon the Baths Committee with suggestions for the improvement of the exterior designs of the baths from the picturesque and ornamental point of view. The testimonial consisted of a solid silver tea and coffee service, of Queen Anne pattern. The Mayor said their object in meeting together was to show their appreciation of a gentleman who had given a considerable amount of time and trouble, besides exercising his skill and ability, upon a work for which he was not under the circumstances able to send in a bill. The work had been done for the benefit of Stafford and neighbourhood, and it would have been most ungrateful if his services had not been in any way recognised. He was pleased to say that they had been recognised to some extent, and he was sure they would all heartily agree with him that Mr. Wormal was fully entitled to such recognition. Mr. Matthews, the chairman of the Baths Committee, made the presentation. He recalled the circumstances under which Mr. Wormal, who was a member of the committee, came to their assistance for the improvement of the elevation, both with respect to the street and the river front. He said he heard almost daily, both from townspeople and from strangers, some expression of appreciation of the value of the work done by the borough surveyor in connection with the interior, and of the beauty of Mr. Wormal's elevation, and he congratulated Mr. Wormal on the spontaneity of the movement for the recognition by his fellow-townsmen of the handsome manner in which he came to the front and placed his professional skill at the service of the committee. He also congratulated Mr. Wormal on the fact that the baths were not the only specimen of his skill, but that throughout the whole length of their grand old street there were monuments of his creation in the form of brick and mortar which would long remain to bear witness to his professional ability. He concluded by formally asking Mr. Wormal's acceptance of the tea and coffee service, with a parchment roll containing the names of the subscribers. Mr. Wormal, in reply, expressed his warmest thanks for the kindness shown to him by the presentation. He explained that he did not in any way offer his services, but was asked by the deputation who waited upon the Baths Committee for the improvement of the site if he would assist the borough surveyor in preparing a sketch of the exterior. He eventually undertook the sketch himself, but he did not anticipate at that time that he should be called upon to provide the working drawings and other things as well while the work went on. That, however, he found to be necessary in order to convey his ideas properly with respect to the work. His only regret was that the whole of his plan had not been carried out, comprising, as it did, a design for the fire station. The consequence was that the building had been left rather bald from that aspect, but he trusted that some time the Fire Brigade would be provided with a better station and the design completed. That would greatly improve the entrance to the Backwalls, which might possibly some day develop into a good street, as there was a lot of property in the Backwalls belonging to the Corporation, the lease of which had not many years to run. The proceedings terminated with a vote of thanks to the Mayor for presiding.

ST. GEORGE'S HALL, LIVERPOOL.

IN 1836, before their tastes found expression in the Philharmonic Society (says the *Liverpool Post*), the good people of Liverpool were ardent in the support of the Liverpool triennial musical festival, which was held—these being the best conditions then obtainable—in St. Peter's Church. Since, however, the festival was a success, there was a general feeling that it should take place for the future in a building appropriate to, and built for the purpose, and so pronounced was the desire that when a public subscription was opened with this object some £23,350 was subscribed within a limited period. For a great town Liverpool was then somewhat remarkable in having no important place of public assembly. The Town Hall, un-

like other and more modern Town Halls, was, in point of fact, a mansion house, admirable and elegant in its appointments, reflecting, as it still reflects, the commercial opulence of the port, but for holding great public meetings and musical festivals wholly unsuitable. But the Town Hall was at that date the only public building of importance, for whilst Liverpool had greatly prospered, and its merchants had built themselves many fine houses, there was still about the city a certain *publique egestas*, due, doubtless, for the most part to the rapid and; it must be confessed, unforeseen growth of the place. Under these circumstances, it is not surprising that the feeling in favour of a further adornment of the city, especially when that adornment also met a public want, was strong and widespread. The Corporation and townsmen of that date were not unlike, indeed, the *nouveau riche* who, finding himself with his pocket full of cash, has a desire, in its way laudable enough, to express his importance in a permanent form. The project for building a new concert hall was taken up warmly, and a public competition was opened among the architects of the country. For the carrying out of so large a work the competition was naturally keen; the sets of plans sent in numbered seventy-five; and the choice of the committee fell upon Mr. Harvey Lonsdale Elmes, a youthful architect, who had just entered upon his professional career in London.

Mr. Elmes, whose genius at the age of twenty-five thus triumphed so signally over the experience and attainments of so many older compeers, was the son of Mr. James Elmes, surveyor of the port of London. In conjunction with Haydon, the latter had compiled a dictionary of the fine arts, and was known as a man of superior taste and ability. But the son possessed not ability merely. Young as he was, he had mastered Greek and Roman architecture down to their minutest details, and, well knowing, as he himself expressed it, that Greek architecture, to be seen in its true beauty, must be executed in Greek marbles and have a Greek atmosphere and climate, he yet conceived that English architects, by studying nature, and boldly throwing aside the trammels of a false classicism, always tending to degradation, might produce a graceful architecture native to our climate, materials, and national character. It is said that he studied his great designs down to the smallest particulars of ornament, drawing the details over and over again, until the proportions were harmonised and perfectly balanced. The truth of this is evident in his work, for if there is one great merit in the design of St. George's Hall, it is the faultless harmony of the proportions.

The plans for the new concert hall were original and bold, but the Corporation discovered about the same time that they needed new law courts, for Liverpool had recently been made the assize town for South Lancashire, and the old courts on the west side of the Exchange were to the last degree out of date and inconvenient. Again there was a public competition as to designs, and again, among eighty-six competitors, Elmes carried off the award. Just at this juncture, as it would happen, the project for the erection of a concert hall hung fire. The first ardour of the scheme was now over, and the committee wanted more money than they had in hand. Under the circumstances, it was wisely arranged between them and the Corporation that the concert hall and law courts should be combined into one building. With this object, the two sets of Elmes's plans were put into the hands of the Corporation surveyor, to produce from them some kind of composite scheme embodying the idea in view. Naturally Elmes demanded that he ought to do the combining himself. Strange as it may appear, the demand was resisted; but the surveyor, happily, was "the soul of honour," supported his professional brother against the Finance Committee, and carried his point. The Corporation were thus saved from perpetrating a flagitious injustice. These preliminaries adjusted, the youthful architect proceeded with his work, the result of which was St. George's Hall, which, although modified in some particulars during its construction, is in every substantial detail as he designed it. The site for the building, the grounds of the old infirmary in Lime Street, is one of the finest and most commanding that could be desired. In those days, however, it consisted of unsightly rubbish heaps, and the erection of the hall was begun not to adorn an imposing thoroughfare as Lime Street is now, but among mean buildings and vacant plots. It is the result of the work that it has gained in architectural interest with every addition to its surroundings, and there is every probability—nay, almost a certainty—that in the richer and more elegant Liverpool yet to come it will be a still finer "ornament to the municipality" than it is even at the present time.

It is not proposed to enter here into the difficulties and discouragements which Elmes had to face in carrying out his plans. He had for his personal friend as well as coadjutor in the work Mr. Robert Rawlinson, assistant surveyor of the Corporation, an able man, deserving to be remembered as the author of the Bala Lake water scheme, an undertaking strictly analogous to the Vyrnwy, and one which its author saw to be absolutely necessary, although it was rejected in favour of the less far-seeing Rivington enterprise. These difficulties, these

discouragements, these contests with committees and conflicts with rumours that the immense building would not stand, combined with undeserving ridicule, are recorded in the architect's own letters, which Rawlinson afterwards printed for private circulation. One instance will be sufficient. The roof of the great hall is a brick arch, 18 inches thick, and 80 feet in span, built with hollow bricks, which reduce the weight by half. This daring piece of building construction fairly frightened most people. The Press gave currency to rumours that whilst building it had collapsed or would collapse; but the wish was father to the thought, for the designer and his supporters knew its strength and smiled at fears. The building was begun in 1842, Elmes and Rawlinson lunching on the ground on bread and cheese on the first day with the horde of navvies who were employed upon the foundations. The work of construction occupied over twelve years; but on September 12, 1854, the hall was formally opened by Mr. J. B. Lloyd, mayor. In 1851 it was visited by the Queen and Prince Consort, but was still incomplete.

The original estimate for the cost of St. George's Hall was 153,000*l.*, but the building was put up in so solid and durable a manner that the actual cost far exceeded that amount. The architect himself exercised whilst able a lynx-eyed supervision, and anyone who examines the masonry critically will observe that it is put together with great exactness, almost calculated, like the public buildings of the Greeks and Romans, to stand without cement. It is curious to hear the youthful architect complaining four years after the building was undertaken, and when the sub-structure was scarcely finished, of "bad bricks, bad work and bad workmen." These were the reasons he assigned for slow progress, but the more probable truth is that he was himself impatient.

The late Sir James Picton, among others, took serious exception to the design of the hall in some particulars, but chiefly because of the inadequate character of the entrances. The door under the south portico, for example, is apparently of noble proportions, but it is a huge architectural sham. The hall into which it opens is in truth not more than half its height; the great bronze gates are immovable, and the only means of ingress and egress is a "low-browed wicket," which gives access to a dark vestibule, which in turn leads to tortuous passages. Again, the late architect and antiquary thought it a defect that the entrances to the great hall from the east portico passed through a corridor not more than 12 feet high; that the entrance to the hall should not have been from one end, that it might burst at an instant on to the view; and that the doors leading to the north vestibule were no bigger than ordinary house doors. Again, he took exception to the windows in the west front as destroying the monumental character of the building from that side, and objected to the square pillars as heavy-looking. After a little reflection, however, these objections become more apparent than real. The doors under the east portico are in the shadow, and do not form a feature of the façade. Moreover, they are not unimposing or dwarfed, for the doors in buildings of Greek and Roman architecture were never great yawning openings like those in Gothic cathedrals. In this respect Elmes kept to the traditions of ancient art as well as to the necessities of the case, for a high entrance from the east must have wholly spoiled the interior. Beyond this, anyone who studies the west front from a point of view of some vantage, say the plateau in William Brown Street, cannot fail to be struck with the perfect balance of the parts. The front is plain, and the lines, though severe, are chaste and effective. The massive character of the pillars is in keeping with the whole, and the windows decidedly heighten the effect.

Severely critical as he was—perhaps too much so—Sir James Picton could not help admiring the admirable Classic taste of the ornament and details of the building. In truth these recall the best periods of Greek art, and show great knowledge and judgment as well as intellectual force. The recessed galleries in the east front were a novel design, but very striking and effective. It should not be forgotten that St. George's Hall is still incomplete. With two exceptions, the ten panels designed for sculpture are still rough unhewn stone, and the fifteen pedestals for statuary between the square pillars beneath the portico and elsewhere are still, with one exception, empty. Were these adornments but complete, we should have a number of fine and graceful lines, harmonising with the beautiful but severe lines of the architecture, and affording objects of pleasure and attraction to the eye, which would make the St. George's Hall at once a public education in taste and a monument of that love for the liberal arts which is the most permanent honour of a community.

Without reviving a bitter controversy which arose as to the position of the great organ, it is interesting to note that one of the most cherished ideas of the architect was a vista through the hall from one of the law courts into the other. In one of his letters he wrote:—"I suppose you to stand on the judge's platform in one court. Your eye, glancing along the ranges of ruddy columns on either hand, in all the richness and strong colour of a foreground, reposes for an instant on the lofty

arched opening connecting with the hall, whose broad and coloured soffit throws a shade upon the grey columns beneath, and forms the middle distance. It pierces the atmosphere of the great hall, passes the corresponding opening into the other court, and, without distinguishing a particle of the detail, from the great distance, finally rests upon the further judge's throne." This "magnificent distance" left out of account the organ, and remained in consequence but a splendid vision.

It needs but to add that Elmes, breaking in health through his arduous labours, undertook a voyage to the West Indies, accompanied by his young wife and an infant daughter. He died abroad whilst still under thirty, and when St. George's Hall was not nearly complete. Liverpool is to be congratulated upon having the most important example of the work of this distinguished architect.

ST. MARY'S CHURCH, OXFORD.

THE Secretary of the Society for the Protection of Ancient Buildings has replied to Mr. T. G. Jackson, A.R.A. He says:—

Assuming that Mr. Jackson has been correctly informed, the fact that two of the existing statues are modern, and that they are not recognisable as such from below, goes far to confirm the statement in my letter. Whatever may be the case nearer the ground, I did not deny that at such a height spurious antiquities would eventually mislead the public. On the contrary, I affirmed this, and I only differ from Mr. Jackson as to the advantage of such deception. In the matter of classical texts good scholars have determined that conjectural restoration is undesirable, and that it is better to leave a gap in a Greek chorus than to attempt to supply the missing lines. The time is approaching when this principle will be more widely accepted. It will be applied with as little question to decorative features in architecture as it is already applied to paintings and isolated pieces of sculpture. If, after every effort, it should prove impossible to secure the unruly members described by Mr. Jackson, and to brace up all that remains of the ancient figures, two alternatives may be considered. The first is to remove the statues and to leave their places untenanted, which Mr. Jackson declines to do. The second is to carve statues which, being frankly modern, can never be mistaken for the productions of another century than our own. Either course would be more honourable to the University, and to the memory of the master-builders who raised and adorned the spire, than that which Mr. Jackson has advised.

LIBRARY ARCHITECTURE.

THE American Library Association is preparing an exhibit for the World's Columbian Exhibition at Chicago, under the auspices of the United States Bureau of Education. A prominent position in the exhibit is to be assigned to library architecture. The purpose of this department will be twofold. On the popular side it will serve to call public attention to the architectural importance and significance of libraries, and to suggest to communities and to individuals the erection of library buildings. For this purpose large and effective exterior views or models are particularly desired. On the professional and technical side it is intended to show the development and present state of library science as regards the adaptation of the building and its equipment to the practical purposes of a library. In this direction more importance attaches to floor-plans, sections and interior details than to exteriors.

Trustees, librarians and architects are invited to send for exhibition drawings or photographs of existing or proposed library buildings or rooms, whether built for the purpose or altered from premises intended for other use. While it is earnestly desired that the large modern libraries should send full sets of plans, it is equally to be hoped that the older and smaller libraries will contribute, for most of the libraries of the future which will derive benefit from this exhibit will be of moderate size and means. Librarians and trustees are asked to send, with their plans, suggestions as to merits or defects which have been developed in use. Architects who are preparing plans for library buildings, or who have submitted plans in recent competitions, are invited and urged to send them for exhibition, inasmuch as any carefully matured plan, even if not adopted, may contain features of practical interest to librarians.

If plans are prepared expressly for this exhibition, it is recommended that they be made on a scale of one-eighth of an inch to the foot, and rendered with India ink. The largest frames on which the plans are to be displayed will be 28 inches high by 40 inches wide, so that plans should not exceed that size. Many of the frames will be only 22 by 28 inches, and this size of plan is preferred by the Bureau of Education. The plans and models contributed will be arranged and displayed

as effectively as the available space will permit. After the Exhibition they are to form part of a permanent library exhibit. If the contributors are unwilling to part with their drawings for this purpose, it is hoped that photographic copies may be permitted.

The Library Association of the United Kingdom has promised thirty or more representative plans of English and Scotch library buildings, and if the American collection can be made thorough and representative, the combined exhibit will not only be very useful to those interested in library administration, but it may also serve to stimulate and encourage the building of libraries in all parts of the United States. Notification of willingness to send plans should be sent at once, and the plans should be forwarded (flat) as early as possible to C. C. Soule, 15½ Beacon Street, Boston, Mass.

ARCHITECTS' FEES.

AT the last meeting of the Stafford Board of Guardians a letter was received from Mr. G. Wormal, architect for the new hospital at the workhouse, with reference to the resolution passed at the last meeting of the Board offering to pay him 85% for the preliminary plans and 5 per cent. in respect to the adopted plans on the contract amount of 3,900*l.* Mr. Wormal said first, with respect to the work done in the abandoned scheme, his account of 115*l.* was prepared with care, and did not include many small matters which he was fully entitled to charge for. Up to the present moment, although the account had been before the Guardians for more than two months, no single item had been called in question. Their first offer he rejected, but offered in his turn, as a concession to sentiment, to reduce his account by 15*l.*, making it 100*l.*, and this amount he still held to, although it was not accepted. He was therefore compelled to decline 85% as settlement of his account. With regard to the second part of the resolution, in a work of this magnitude, variations of a slight character were bound to occur during the progress of the work which would have to be adjusted at completion, but he could assure the Guardians that no material addition or alteration would be made at his instance without consulting them first. He would suggest, therefore, that the commission be 5 per cent. on the actual cost, and not on 3,900*l.*, the contract amount. The Rev. E. C. Perry thought there was no doubt they would have to pay. Mr. Dodd was of the same opinion, but at the same time considered there had been neglect in not having a proper bargain. He moved that the charges be paid. Mr. Goodall thought it was right Mr. Wormal should be paid his charges, which no one had disputed. The Chairman said he had taken the opinion of several gentlemen whom he could rely upon, and they thought that the charges were somewhat too high, and that under the circumstances the architect should have conceded more than he had done. At the same time, it was pretty sure that they would be beaten if they carried the matter to a reference, and therefore he should support the resolution. Mr. W. Peach said it was the unanimous opinion of the business men who formed the committee that the charges were too high, especially in respect to those plans which were discarded. Major Johnson remarked that if the Guardians thought these charges were more than a country architect ought to make, in future they could dispense with his services. Mr. W. H. Peach asked if the building work was going on satisfactorily. He had heard remarks as to the material that was being used. Mr. Sampson said the Building Committee considered that some of the material was not up to the standard they could wish. The committee had only met once as a body, and he suggested that they should meet again and report to the next meeting of the Board. The Chairman thought it would be necessary to have an understanding that the 5 per cent. should be paid on a sum not exceeding 3,900*l.* In the result, the resolution was carried.

ENBORNE CHURCH, BERKSHIRE.

THERE are very few churches now left in Berkshire which have not been modernised by the hand of the restorer. One of the few so remaining, says a correspondent of the *Reading Mercury*, is Enborne, near Newbury, a long, low, quaint little church with a very small wooden bell turret. Inside it is filled with high deal pews, too narrow and hard to be comfortable. But the church possesses many points of interest for the antiquary. Two years ago I visited and examined it. The chancel had been restored, the whitewash removed, and one fairly discernible fresco (the Annunciation) brought to light; probably one of a series, the rest of which are no longer visible. Open choir-stalls had been added. The piscina is double arched and behind, within the recess, is a hollow in the wall, probably the aumbry. The east window is poor, a later addition. The nave had once two aisles; of these only the southern now remains, with its fine Norman

arches and pillars; the corresponding ones on the opposite side are yet remaining, but are built up in the northern wall. These are, in the proposed restoration, to be uncovered, and an aisle built, but the design contemplated externally is scarcely Norman, nor is it likely to improve the appearance of the church, for it will hide the very high-pitched roof and tend to dwarf the church as seen from the lych gate.

The southern wall had to be rebuilt some years ago: it was being re-pinned, but was in such a bad condition that it fell down, nearly killing the workman engaged upon it. A very perfect fresco was lost upon this wall, but I did not ascertain what subject it represented. The wall had been undermined with vaults, which made it unsafe and caused its destruction. I fear the western portion is also in a bad condition. The timbers supporting the turret are eaten away, and like tinder, and the whitewash peeling off with damp is exposing to view the well-known red-brown colour of another fresco.

There are very few memorial stones within the church, none older than the last century; the oldest is dated 1734, to the memory of the Rev. Mr. Dashwood. Another rector, the Rev. Henry Craven, is commemorated by a very handsome dark marble vault stone, ornamented with the coat-of-arms and crest. There is also a tablet to the Rev. N. Lloyd, 1789, and two others to the Bunbury family, who owned Marlstone House. In the nave is a vault stone to John Richens, of Newbury, 1731; also a large vault stone; but this last is so hidden beneath the pew floor that neither name nor date is visible. The churchyard is very full; but the stones are so neglected and overgrown with orange lichen that many inscriptions have perished and become illegible, though with care they might be discovered and restored. The quaint little grinding organ was probably once considered good. It is by Bevington. This, of course, will be ousted by an organ or harmonium, and the familiar tunes of the old grinder will also disappear, though the change will doubtless not be regretted by anyone.

Enborne is interesting as having been a centre of the warfare between King Charles and his parliament. Near here the troops met in battle, and there probably many of the slain soldiers were buried, although in many instances such burials took place on the parish boundaries nearest to the field of battle. To this day relics of the fight are constantly being found—cannon balls, bullets, or accoutrements. It was in this quiet little parish that two battles of the Civil War took place.

The church plate consists of a tall cup dated 1663, but its plate mark is of the year 1633, when it was made, although not perhaps presented to the parish until after the war. A thin paten, very much worn, has four silver marks; its date letter is 1679. The rest of the plate is of this century, namely, a large paten or plate, 1801, and a modern alms-plate, 1856, the gift of Mr. Valpy. Lysons gives but a brief account of the parish, which, he says, was divided into two manors, East Enborne and West Enborne, the latter known as Chéney. Apparently the two manors were united in the time of King Henry VIII.

The old clerk's notes of the parish registers are still preserved, loose parchment sheets stitched together dating from 1559 and, I think, ending with the Civil War time. These are in fair condition, though in some parts illegible. The later registers have been neatly transcribed by former rectors, and it would be a good thing if the old ones were also neatly transcribed.

LONDON IMPROVEMENTS.

THE Bill which has just been deposited in the Private Bill Office of the House of Commons by the London County Council, dealing exclusively with specific improvements, as distinguished from general improvements (which are embodied in another of their deposited Bills) contains forty-nine clauses, including the "betterment" clause, which after being rejected by Hybrid Committees of the House of Commons for two years is again introduced, but in a form which, in the event of its not receiving the sanction of Parliament, need not necessitate, as in previous years, the withdrawal of the contemplated improvements. As we have already stated, the most costly of the works under the powers of this Bill is the construction of the "New Central Street" from Southampton Row, Holborn, to the north side of the church of St. Mary-le-Strand, which improvement will include the removal of the southern side of Holywell Street, and the laying out of ten new but subsidiary streets running from the new main thoroughfare to points surrounded by the Strand and Holborn. The Bill does not contemplate any interference with either of the churches in the Strand, except the setting back of the railings surrounding St. Clement Danes. The gross cost of this improvement is estimated at 3,869,550*l.* The Bill also seeks power to enable the Council to make a new approach to the Tower Bridge by the widening of Bermondsey New Road and Church Row, and the laying out of a new road between those two thoroughfares. The gross cost of this improvement is estimated at 436,000*l.*

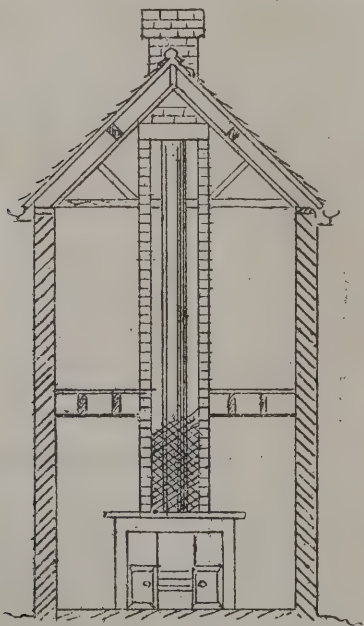
The proposed rebuilding of Vauxhall Bridge and the maintenance of a temporary bridge during the rebuilding, for which powers are also sought in this Bill, are estimated to cost 484,000*l.*; and the proposed new ferry across the Thames between Rotherhithe and Ratcliff, powers for which are also included, is estimated to absorb 443,000*l.* The remaining improvements to which Parliamentary sanction is sought by this Bill is the widening on the south side of the approach road to Woolwich Ferry, estimated to cost 3,000*l.*, and the widening of Wood Lane, Hammersmith, the gross cost of which is put down at 47,215*l.* With reference to this widening, the Bill expressly excludes it from the operation of the "betterment" clause. The rehousing of the working classes who will be displaced by the destruction of the new streets will bring the estimated gross cost of these improvements up to 5,327,765*l.*



Cottage Building.

SIR,—There are two improvements which I think might be made in cottages which would add greatly to the comfort of the inhabitants. First, as to heating. At the present time the upper rooms derive no benefit from the fires below. A medical man said to me some time ago, "People in cottages often say to me, 'Well, doctor, I am quite warm in bed and well wrapped up.'" "Yes," he said, "you may be, but at the same time you are breathing cold air and chilling your lungs at every breath." This is quite true, and a dry warm atmosphere is one of the chief things to be considered in case of illness, and indeed for keeping in good health. In small houses a fire in a bedroom is a great difficulty, as I know full well.

I would propose that the usual chimney-breast should be done away with, and that the chimney should consist of an iron pipe or sanitary earthenware pipe carried up from the lower room through the room above, so that it may radiate heat into both rooms; on either side I would build up a wing of brick-work projecting a brick and a half, and before this might be



placed wirework, as shown in the sketch, in the lower room. The pipe at the top of the bedroom would disappear in an ordinary chimney-stack, as drawn; a clear space would be left between the pipe and the wings for the heat to circulate. By this means the bedroom would always be kept dry over the kitchen, and would at all times be healthier and more comfortable than sleeping in a damp, cold atmosphere. The cost would be absolutely nothing extra in a new building. The fixing, length and material of the pipes are merely matters of detail. The pipe could be coloured stone-colour, like the funnels of steam yachts—or indeed any colour.

Again, why is all the roof-space to be shut up and not utilised? In a room of 10 feet square with an ordinary pitched roof, ceiled in the usual manner, there is a loss of 200 or 300 cubic feet of breathing space. I would propose that the flat ceiling should be given up and the rafters either underdrawn, match-boarded or covered with wire-wove material or linoleum. If there should be a necessity for a tie-beam in such small rooms, then a tie-beam 6 inches square, with a king-post in

the middle, both nicely moulded, would be, not an eyesore, but a pleasant feature in the room. In case of larger rooms, if it was desired to have all the roof-space free from tie-beams, a flat wall-plate 1 foot wide, consisting of two 2-inch planks with a half-inch boiler-plate, the lengths properly rivetted together, all bolted secure, would sustain a great lateral thrust from the rafters of the roof. The roof should have a layer of felt.

These suggestions, of course, are applicable to any house. In a country like this we want all the warmth, pure air and comfort we can get in our houses.

Whorlton Vicarage.

(Rev.) J. C. FOWLER.

Beauvais Cathedral.

SIR,—I observe in one of your "Notes" last week a reference to a work by M. Benouville on the cathedral of Beauvais. We can hardly have too many disquisitions on Mediæval building, but it ought not to be forgotten that M. Benouville is not the first who has attempted to discover the principles by which such a wonderful *tour de force* as we can see at Beauvais was produced. Need I remind your readers that the subject is treated in a masterly way in the "Dictionnaire raisonné de l'Architecture française"? Viollet-le-Duc considered that the cathedral (that is to say, the choir) was the very best exemplification of the building science of the thirteenth century. In it, he says, the architect went as far as he could to display what was feasible with stone. The accident is ascribed by Viollet-le-Duc to two causes—first, the defective workmanship of the men; secondly, the insufficiency of the materials. It might be said that the architect designed a remarkably economical church, and one which gave the fullest scope for processions and other ceremonials; but, as sometimes happens in England, either the clergy or the contractors for the masonry considered that the architect's margin of safety was excessive, and they carried his principles farther than he would attempt. To say, therefore, as is done in the guide-books, that there was a miscalculation on the part of the architect of Beauvais is not warranted. If M. Benouville will only succeed in persuading the compilers of such works to hesitate before they hazard explanations he will be doing a good work. It may be granted, however, as possible that the thirteenth-century designer was not sufficiently acquainted with the qualities of the building stones that were to be used, and, if so, the case would go to prove that the design was not prepared at Beauvais.—Yours truly,

F. S. A.

GENERAL.

The Demolition of the Hippodrome, Paris, is now in progress. The scheme to convert the immense building into a museum of machinery has therefore failed. The site will be used for mansions.

Mr. T. Chatfield Clarke has been appointed a justice of the peace for the Isle of Wight by the Lord Chancellor.

Mr. J. Charlton Parr, the late chairman of Parr's Banking Company, Warrington, has offered the town 5,000*l.* for the erection of a public hall in Warrington.

The Dundee Institute of Architects held their first ordinary meeting of the Institute for the session on Thursday evening, January 5, when a lecture was delivered on "Curiosities of Architecture in Dundee," by Mr. A. H. Millar, F.S.A. Scot., Dundee.

The Partnership formerly existing between Messrs. Keen & Drake has been dissolved. Mr. Keen retains the offices at 41 Bedford Row.

The Glasgow Corporation have accepted tenders for the erection of a new police station in Oxford Street, South Side.

The Manchester City Council have decided to make an application to the Local Government Board for power to borrow a sum of 150,000*l.* for the erection of the new Municipal Technical School and other purposes of the Technical Instruction Acts; 110,000*l.* will probably be the sum required for the building, but in addition there will be a considerable amount required for the equipment and fitting of the new school.

A Sub-Committee of the Glasgow Town Council, after long investigation, have reported against the adoption of overhead electric traction for tramways in that city. They recommend consideration of the cable system.

The Manchester Church Building Society, at the quarterly meeting on the 26th inst., will consider the following applications for grants:—Towards building a parsonage for St. Matthew's, Preston, at an outlay of 1,640*l.*; building a mission-room for the Albert Memorial parish, Manchester, at an outlay of 630*l.*; purchasing a parsonage for the parish of Christ Church, Patricroft, at an outlay of 1,305*l.*; building a mission-room for the parish of St. Peter's, Fleetwood, at an outlay of 1,110*l.*; and rebuilding Royton Church, Oldham, at an outlay of 6,792*l.*

The Architect.

THE WEEK.

It was wisely decided by the Commissioners of Sewers on Tuesday that Mr. H. H. BRIDGMAN's proposition for the improvement at the junction of Cheapside, St. Paul's Churchyard, Paternoster Row, Newgate Street, and St. Martin's-le-Grand should be considered. It appears that Colonel HAYWOOD, the engineer, recommended the scheme twenty-seven years ago. Everyone knows that the highway is far too limited to accommodate the combined traffic from north, south, east and west which meets there. It is calculated that 100,000 pedestrians and 30,000 vehicles pass every day. Mr. BRIDGMAN recommends that on the west side the frontage should be made to follow a curved line from the corner of Panyer Alley to St. Paul's Churchyard. The effect would be an addition of 20 feet to the roadway at PEEL's statue, 30 feet at St. Paul's Churchyard, and 30 feet opposite the Post Office Yard. The cost of the improvement is put down at 100,000*l.*, although very few houses are affected. Whatever is the outlay, something will have to be done to meet the traffic which, after the creation of a widened roadway, will still need severe control by the police. It was suggested that the London County Council and the Government ought to contribute towards the improvement, but it would be foolish to rely on either body. Fortunately, the City funds are not yet exhausted.

THE directors and proprietors of the Manchester Exchange have lately demonstrated that they were willing to undergo a sacrifice, in order to meet the interests of the citizens, by an alteration of the exterior of the building. But the Corporation are not satisfied, and seek for more land. Notices have been served on the directors by which, *apropos* of a scheme for obtaining accommodation, a building line is set down for adoption which is alleged to be an encroachment on their property. The Master of the Exchange has informed the Town Clerk "that the directors of the Manchester Royal Exchange are advised that it is open to grave doubts whether the laying down of the new building line indicated is within the powers of the Corporation, and accordingly the directors do not admit the validity of the notices, and will in case of necessity assert all legal rights and powers to which they may be entitled of erecting or altering their buildings in advance of the new building line mentioned in the notices. While thus protecting the rights of the proprietors, the directors desire, as far as possible, to avoid any course of action which would be opposed to the views of the City Council, and they have therefore resolved to provide additional accommodation for the convenience of their subscribers by means of such alterations inside the building as will not meanwhile necessitate any interference with the external structure." The communication, it must be said, is not a sign of diplomatic skill. If accommodation can be provided without any change of the exterior of the building, there was no use in asking authority for such a change. Again, if the notices are to be obeyed, there is not much visible gain in declaring they are to be resisted. In the contests between directors and City Council it is to be hoped the architect will not have to undergo the misfortune of mutilating his building more seriously than was first proposed.

THE new Archbishop of Westminster is credited with the possession of ability as a financier, a quality which no doubt helped to gain influence for him in Manchester. The sale of the seminary at Hammersmith by his Grace is a transaction which would do credit to any of the Fellows of the Surveyors' Institute. The buildings were erected to contain ecclesiastical students, but financially the college was not a success, and it was decided to have the training conducted elsewhere. Every expert knows that when buildings have to be employed for uses which the architect did not contemplate their value is much diminished in the market. It did not matter whether the seminary was utilised by the Jesuits or some other

religious order, or was vulgarised by the Salvation Army, as was one of the possibilities. In any case costly changes must be undertaken. As we believe the Jesuits offered 25,000*l.* for the premises, that sum may be considered as representing the market value. It was also desirable to lose no time in getting rid of the premises. Through his skill in conducting the negotiations (for his Grace was his own agent), the Archbishop has succeeded in obtaining 37,000*l.* for the property. The purchasers are the nuns of the French order of the *Sacré Cœur*, in whose schools young ladies of the highest and wealthiest classes are trained for society. We believe they acted on the advice of French agents, who are not necessarily the best judges of the value of property in London. As English ladies of all creeds are sent by their parents to the sisters' schools to be polished in French style, it is, we suppose, an advantage to offer equal facilities in England, and hence a liberal price was paid to gain a footing at the West End. It is to be hoped that for the alterations an architect will not be despatched from Paris. The buildings have been neglected by the occupiers, but they are among the best modern examples of collegiate Gothic, and the designer should have the control of any works that may be proposed.

THE sum of 115,000 francs granted by the French Government towards the cost of casts of examples of French sculpture for the Chicago exhibition has been expended. The progress of the art from the eleventh to the nineteenth century in France will be illustrated. There are casts of the portals of cathedrals with figures, each of which have cost about 10,000 francs. Examples of the Mediæval work at Clermont, Bourges, Chartres, Rheims, Beauvais, Amiens, Rouen, Paris, will be comprised in the collection. The sculpture of the Renaissance period will be suggested by casts ranging from the *Tomb of Francis II. and Marguerite de Foix* at Nantes to the JEAN GOUJON's *Fontaine des Innocents* in Paris. The seventeenth and eighteenth centuries have also a share, but the only representatives of the nineteenth century will be a work by RUDE and another by BARYE. If casts of later sculpture are desired they will have to be obtained in other ways.

ANYONE who is acquainted with the records of French life in the eighteenth century knows how very difficult it is to distinguish between facts and falsehoods. There were writers who found pleasure in inventing and printing calumnies, and every man or woman who was distinguished was liable to be traduced without any reason except the production of sport for writers and readers. At a later time there is a risk that the origin of the statements will be forgotten, and they will be accepted as historical facts. French society of the eighteenth century and the beginning of the nineteenth, in consequence, appears to many as corrupted throughout. A writer in the *Illustrated London News*, through this prejudice, has been led to make a statement which has given pain to a French nobleman, who, from the possession of property in England, may almost be accounted as an English gentleman. In describing an engraving of one of the miniatures which are on exhibition in New Bond Street the subject is said to be "Marquise DE NOAILLES, mistress of PRUD'HON, committed suicide 1821." There is no doubt the painter's mistress killed herself in 1821 on May 26, but her name was CONSTANCE MAYER. She was a pupil of PRUD'HON, and for eighteen years had charge of his home. He suffered the extremest remorse for her death. The most credulous believer in ancient scandals could hardly credit that two ladies killed themselves to vex PRUD'HON, therefore the description of the subject of the miniature is inaccurate. But it can be proved to be baseless in another way. At that period there was no Marquise DE NOAILLES. In 1802 a Marquise died very young, leaving a son, who was afterwards Duc and was admitted into the French Academy. But until 1868, when the marriage of his brother, who was then Marquis DE NOAILLES, was celebrated, the aristocracy of France was without a Marquise DE NOAILLES. It is well to put these facts on record, for otherwise we may expect to find that future biographers of PRUD'HON will have much to say about his conquests amongst the nobility, which are as legendary as those of Mr. MANTALINI or DICK SWIVELLER.

FRENCH GOTHIC.—II.*

THE Mediæval abbeys have not secured much attention from students of architecture. If the buildings are still used for habitation, one naturally hesitates to claim admittance in order to examine them. If they have been adapted to uses which the designers did not contemplate, they are sure to be deficient of many interesting parts. Such causes produce general neglect. It would need a lifetime to do justice to the survivals of the French abbeys, and the time would be well spent, although few might care about the information. The study of the abbeys is interesting on account of their character, and also because they may afford aid in working out the histories of the churches, cathedrals, and other Mediæval buildings. If, for instance, the great structures that were outside the limits of an abbey were designed by monks, we might expect to find examples of a similar design among the abbey works. It should be remembered that a monk was expected to be loyal to his order, and if possessed of talent of any kind he was glad to exercise it for the advantage of the house to which he belonged. The abbeys were, therefore, treasuries of the

religious purpose was designed by a monk, canon or ecclesiastic, yet after the twelfth century the architects, with some imperceptible exceptions, were laymen. He cites as examples of the latter ROBERT DE LUZARCHES, THOMAS DE CORMONT, HUGUES LIBERGIER, ROBERT DE COUCY, PIERRE DE MONTEREAU, JEAN DE CHELLES, and ERWIN DE STEINBACH. According to M. VITET, the round-arched or Romanesque buildings are the work of the clerics, while the pointed or ogival arch is a characteristic of a building which was produced by a layman. The intermediate twelfth century was therefore, according to him, a period of struggle between the adherents of the two systems.

A conclusion by M. VITET on any point in the history of Mediæval art calls for respect, but in this case he seems to us to have been too summary in dealing with evidence. If the monks were defeated by laymen in the twelfth century, they would not so easily abandon their own system to introduce one which in their eyes must have appeared as a worldly invention that was intended to delude good people. The pointed arch would be as little respected as physical science is now by many ecclesiastics. We find, however, that the new style was generally employed in abbeys, and that circumstance alone is enough to prove how it appeared as attractive to architects who were monks as to those who were laics. The identification of the style with ecclesiasti-



CELLAR (WITH ALMONRY BEYOND), MONT ST. MICHEL.

works of the community executed at different times. If a monk were employed as an architect, painter or sculptor by the secular clergy or by laymen, it may be assumed that he left some example of his ability as a memorial of himself among his brethren. The history of the Dominican artists by MARCHESE proves to us that the practice of reserving works for the convents was kept up until a comparatively late time. On the other hand, if we could not discover any correspondence between the architecture of some part of an abbey and the buildings of the surrounding district, it would be reasonable to conclude that the designer of the latter was not a monk, but a layman.

It is not possible to ascertain the names of more than a few of the Mediæval designers of France, but an effort has been made to determine whether buildings were designed by laymen or monks. M. VITET affirms as if it were incontestable that, although prior to the twelfth century every building in the north of Europe which was to be used for a



ALMONRY (WITH CELLAR BEYOND), MONT ST. MICHEL.

cism would be an impossibility without the most cheerful co-operation of the monastic orders as well as the clergy.

M. CORROYER recognises the importance of the causes which exercised an influence on French Gothic, and accordingly a division of his book is assigned to "Monastic Architecture." He says nothing about a contest of architects. He quotes M. A. LENOIR'S words:—"From the early centuries of the Christian era down to the thirteenth century architecture was practised only by the clergy, and came to be regarded as a sacred science." M. CORROYER explains how the monastic system arose and under what conditions the practice of architecture was made part of the duties to be observed. The power exercised by the monks of certain abbeys, such as Cluny, which became schools of art, is described, as well as the effect which changes in discipline and reformations in monastic practices produced on the character of churches. It is also shown, as in the following paragraph, that the lay architects derived their knowledge from masters who belonged to the orders:

It is bare historic justice to remember that the Middle Ages derived their chief title to fame, and all their intellectual enlightenment, from the abbeys, and that the great religious houses were in fact

* *Gothic Architecture.* By Edouard Corroyer, Architect to the French Government, and Inspector of Diocesan Edifices. Edited by Walter Armstrong. (London: Seeley & Co., Limited.)

schools, the educational influence of which was immense. It must be borne in mind that if the great cathedrals of the twelfth and thirteenth centuries were not actually constructed by the monks, their architects were nevertheless the pupils of monks, and that it was in the abbey schools, so generously opened to all, that they imbibed the first principles of the art they afterwards turned to such marvellous account. The study of architecture in particular was not merely theoretical. It was demonstrated by the monks in their important monastic buildings, the crowning point of which was the abbey church, a structure often larger and more ornate than contemporary cathedrals.

The disturbed condition of several districts in Europe compelled the monks to fortify their abbeys for the protection of their valuables. As the abbots were often obliged to furnish men and arms to their kings the abbeys were treated as ordinary castles by enemies, and it was therefore



REFECTORY, MONT ST. MICHEL.

necessary to strengthen them against besiegers. Our readers who may not be archæologists cannot fail to remember from SCOTT'S "Monastery" and "Abbot" the dangers which surrounded monasteries at times of disturbance.

One of the most interesting survivals of a fortified monastery is Mont St. Michel, on the French coast. Anyone who has visited the place will recollect that the site possesses those natural advantages which impart security. The buildings can only be approached during a limited number of hours every day, but the Benedictine monks resolved to make security doubly sure, and they constructed works which still excite admiration. M. CORROYER has been long officially connected with Mont St. Michel, and there is no architect living in France who has a more exact knowledge of every part of the buildings. The top of the hill is about 250 feet above the sea, and the architects adapted their buildings to the peculiarities of the site. As M. CORROYER says, they set about their work on the same principle as the Pyramid builders, and a section of the hill and buildings may be said to be pyramidal—an arrangement that is most impressive, from whatever side the group is observed. The church is the nucleus of the group, and around it are erected cloisters, towers, guest-rooms, dormitories, &c. The buildings have been raised in various periods between the eleventh and fifteenth centuries. For example, the Galerie de l'Aquilon, or Gallery of the North Wind, as will be apparent from the woodcut, belongs to the early part of the twelfth century; the vaulting is of a later time. In 1203 a great part of the buildings were destroyed. Under Abbot JOURDAIN and his successors almost the entire monastic buildings were constructed:—

As the peculiarities of the site made it impossible to adhere strictly to the Benedictine system of direct communication between the main

buildings and the church, the *lieux réguliers*, or accommodation reserved for the monks, were disposed above the magnificent building to the north of the church, which from the time of its foundation was known as *La Merveille* (the Marvel). This vast structure fairly takes rank as the grandest example of combined religious and military architecture of the finest Mediæval period. The *Merveille* consists of three storeys, two of which are vaulted. The lowest contains the almonry and cellar; the intermediate storey, the refectory and the knights' hall; the third, the dormitory and cloister. The building consists of two wings running east and west. The apartments are superposed as follows:—In the east wing the almonry (see illustration), the refectory (see illustration), and the dormitory; in the west the cellar (see illustration), the knights' hall (see illustration), and the cloister. This splendid structure is built entirely of granite. It was carried out by one continuous effort, under the inspiration of an incomparably bold and learned design of the Abbot Jourdain, to which his successors religiously adhered. The undertaking was entered upon in 1203 and finished in 1228, the final achievement being the cloister, the architects or sculptors of which are commemorated by an inscription in the spandrel of one of the arcades in the south walk. To fully appreciate this stupendous monument we must realise the extraordinary energy which enabled its architects to complete it in the comparatively short space of twenty-five years. We must take into account the conditions of its growth—its situation on the very summit of a rugged cliff, cut off from the mainland at times by the sea, at other times by an expanse of treacherous quicksand. We must also consider the enormous difficulties of transporting materials, seeing that all the granite used was quarried by the monks from the neighbouring coast. It is true that an unimportant quota of the stone was dug from the base of the rock itself. But though the passage across the sands was by this means avoided, the difficulties of raising great masses of stone to the foot of the *Merveille*, the foundations of which are over 160 feet above the sea level, had still to be met. It seems certain that the east and west buildings of which the *Merveille* consists were built at the same time, for though certain differences are perceptible in the form of the exterior buttresses, they evidently result from the interior formation of the various apartments. A study of the plans, sections and façades of the buildings is convincing on this head, and the general arrangements, notably that of the staircase, all point to the same conclusion.

The character of the work may be inferred from the engravings after M. CORROYER'S drawings; but from Mont St. Michel a great many most valuable illustrations could be derived. It is not only in refectories and cloisters that skill is seen, but there are countless parts within and without which reveal the mind of an artist. It is a treasury for



CHAPTER-HOUSE, OR "HALL OF KNIGHTS," MONT ST. MICHEL.

which the French may well feel grateful. It would be a crime if the conservation of the building were neglected on the score of economy, or in the hope of offending the clerical party.

Another chapter relates to the circumvallation of the towns. The gatehouse of Mont St. Michel prepares the visitor for what he has to see on the summit of the rock, and at Carcassonne, Aigues-Mortes, Avignon, St. Malo, beauty was imparted to the sternest system of defence. The Mediæval

builders were unable to realise that ugliness must be a quality of utility. One reason for the difference between the work of that period and our own is described by M. CORROYER:—

■ The Latin, Roman, Gallo-Roman, Romanesque and Gothic architects were versed in every department of the art they practised. The same architect was called upon to construct the church and the fortress, the abbey and the ramparts, which were often its necessary complement, the donjon and castle, the town hall, the hospital, the rural barn and the urban dwelling. He was responsible not only for the inception of every class and form of building, but for its successful elaboration; on him alone the responsibility of its execution rested; no scientific specialist checked his conclusions and verified his calculations as in our own time. The system by which the architect and the engineer have each their separate functions and responsibilities in the construction of the same building was unknown. The builder, or mason, as some would have him called, was an architect in the fullest sense. He himself traced the diagrams of his conceptions and directed the execution of every detail, careful alike of stability and beauty. It is a curious and disheartening phenomenon that such a direct contravention of the principles of Mediæval art as the modern system of divided responsibility implies should obtain only among the French, the very people to whom Western Europe owes its initiation into those principles. In England, in Belgium, in Holland, Switzerland and Germany the architect is also the engineer; the science and the art of his craft are inseparable. This intimate union of qualities gives an individuality to certain productions of these nations which we might well lay to heart and make the subject of serious comparative study. We must needs admit to begin with that we ourselves have become disciples rather than pioneers in a great movement.

The examples of castles and keeps, gates and bridges, are additional evidence of the relations between all classes of Gothic architecture. However diversified might be the purposes of the structures, and however novel the arrange-



GALERIE DE L'AQUILON, MONT ST. MICHEL.

ments, they all show a recognition of the principles of the art and a capacity to realise them. This skill is further seen in a great many of the civil buildings which M. CORROYER describes. The barns at Perrières and Provins, the granary at Vauclair, the lazaret-house at Tortoir, the hospitals at Angers, Ourscamps and Tonnerre (the last having a great hall measuring 300 feet by 60 feet, with an open timber roof) display remarkable skill in adaptation to necessities. The houses show no lack of variety, and whether stone or wood was employed, picturesqueness was aimed at and secured; even the houses in a long street became picturesque.

It was inevitable that M. CORROYER should be obliged to go out of France for the majority of his examples of town halls. The French Communes did not possess sufficient liberty or wealth to erect buildings of the class. M. CORROYER says that "the greater number of the infant Communes were sunk in poverty, and so overwhelmed with dues and taxes that they had no margin for communal buildings. In the fourteenth century even the Commune of Paris could boast only the most modest of town halls. In 1357 ETIENNE MARCEL, provost of the merchants, bought from the collector of the salt tax a small two-gabled building which adjoined several private dwellings. We may, therefore, conclude that down to this period the town hall was in no wise distinguished from an ordinary habitation."

It is not necessary to consider M. CORROYER's book further, and we arise from a perusal of the pages with an increase of our respect for the author. He must have found a difficulty in observing the limitations of so small a volume; but he has, however, contrived to produce chapters that will be a guide to all classes of French Gothic. The intention of the author was to address architects, but amateurs and tourists in France will find that the book is not beyond their comprehension, and a knowledge of the pages will impart additional interest to the buildings that are visited during excursions.

ST. MARY'S CHURCH, OXFORD.

THE Secretary of the Society for the Protection of Ancient Buildings must have an odd sort of passion to be confessed in public, for he has once more written to the *Times*, saying:—

The Society for the Protection of Ancient Buildings is by no means "annoyed" at having been unprovided with the information which Mr. Jackson himself has "still to verify"; nor will it be led away from the point at issue by his somewhat irrelevant attack. However fragmentary the old statues may be, there is still abundant interest in the genuine portions of them. This Mr. Jackson admits. Will he kindly tell us what interest he expects us to find in the proposed substitutes—confessedly imitations of the old work, used as makeshifts to conceal the gaps which will have taken place in the architecture? In the opinion of this society the manufacture of such things is in itself an injury to that art of sculpture which, as Mr. Jackson perceives, should always bear some serious relation to the buildings upon which it is employed. The Mediæval sculpture was never makeshift, but was produced by imaginative artists, doing their best to convey the ideas of the period in which they worked. Whereas the masons who have been trained to supply modern antiquities, in all styles, are not employed to express their own ideas. It is their business to turn out feeble and lifeless imitations, in which the shortcomings of the old work are parodied, while its merits are necessarily ignored. If any one desires to see what these productions are like, deplorable examples may be instanced throughout the country, and notably in the "restored" north porches of Westminster Abbey. Compare these with any of the mutilated porches which are, unhappily, so numerous in France. That of St. Etienne, at Beauvais, is a good example, through which, though every figure is shattered and headless, the undying beauty of the original conception still shines. Mr. Jackson appears to have misunderstood my use of the words "frankly modern." It is a matter of course that any intelligent sculptor would, so far as possible, put himself under the influence of the architecture of which his work was to form a part. But, if an artist of any character, and free from the trammels already referred to, he would still give us ideas expressive of himself and of the society of to-day, between which and the society of the Middle Ages there is so wide a gulf. This cannot be bridged over by servile imitation, but only by a sympathetic understanding of the discrepancies and *rapprochements* of either epoch. For my part I think that the "pedantry" does not lie with the society, which seeks to discriminate between the real works of an organic period of art and the makeshift diagrams which are too often used to supplant them.

Mr. Jackson in reply writes:—In former letters for which you have been so good as to find space I have explained that the statues round the base of the spire have so far perished that it is not safe even to allow their ruins to remain; and further that, if the niches are left empty after the statues are removed, the outline of the steeple would be spoiled. To this Mr. Thackeray Turner replies in your issue of to-day that new statues would be confessedly "makeshifts" to conceal the gaps that will have taken place in the architecture." This is certainly a humorous way of putting it. If the spire itself should fall in and have to be renewed, I suppose, by the same rule, Mr.

Turner would regard a new spire as a makeshift to conceal the gap which would undoubtedly have taken place in the architecture. And the statues at St. Mary's are in their measure as necessary to the completeness of the design as the spire itself. To his question, what interest I expect him and his friends to take in these proposed makeshifts, I reply that there is no reason why the new statues should not be as interesting as their immediate predecessors, of which the principal parts are only forty years old, but "whose effectiveness," Mr. Turner says, "has often struck members of his committee," until, I suppose, they found out they were admiring what they call spurious antiquities. With the latter part of Mr. Turner's letter I have no quarrel. I have not and never had any sympathy with mock-Medævalism, and as I said in my last letter, I have no intention to put up slavish copies of the old statues. Mr. Turner turns my "slavish" into "servile," and gives me back my own sentiments in no doubt much finer language. The Society for the Protection of Ancient Buildings has an excellent zeal; it is a pity it should not always be according to knowledge. The days and hours I have spent on the scaffolding of St. Mary's trying this stone and that stone in the hope of saving it, and in particular handling every bit of sculpture, and only bringing myself at last to the sad conclusion that preservation was impossible, may, I venture to think, carry as much weight as the protest of this society, written comfortably five doors off from here, without any examination of the building or any reference to the published reports, but simply demanding that the old statues should not be taken down because old sculpture is more interesting than new. We do not need Mr. Thackeray Turner and his society to teach us that. With this letter my share in the correspondence must cease. If Mr. Turner likes the last word he is quite welcome to it.

THE ANTIQUITIES OF APULIA.

THE Rome correspondent of the *Times* writes:—In the multitude of its exhausting demands on the budget the Italian Government finds something always for its artistic and archaeological interests, and some of its latest researches into the mines of art-wealth almost or quite unknown are of great value to students. Signor Boni, inspector of antiquities for Apulia, has been for the last year employed in cataloguing and securing photographs of the monuments of the region under his care, indicating, to the study of the architect and Mediæval archaeologist, basilicas and churches of the eleventh to the thirteenth centuries, with a wealth of material unsuspected hitherto. Amongst these is the discovery of a Norman cathedral at Nardo, entirely covered by *barocco* restorations of a Neapolitan bishop at the beginning of the last century, by the removal of which there appear the columns of the original, with capitals of olive and palm decoration, the motive of which is borrowed from that of the vases of Magna Grecia, with pictures of excellent technique, one of which bears the date of 1249, with an inscription recording that the Benedictine abbot, Goffredo, had caused them to be painted *tempore Divi Friderici* (Frederick II. of Suabia) by the painter Bailardo, with others of the thirteenth century of great value for the accuracy of the vestments of the clergy. The cathedral has three naves, with circular apses, and appears to have been the work of the Norman counts of the end of the eleventh century. The edifice presents singular characteristics in the dissimilarity of the arches, which differ on the two sides of the church, those on the right being of a rude and robust type, as of the first Norman construction, the left of exquisite elegance, with indication of Saracenic influence, the *ensemble* reminding of the façade of the Roman-Pisan church of St. Paolo à Ripa d'Arno, the portico of the abbey of St. Clement at Casauria, St. Ambrose at Milan, and other early structures, in which the composition involves symmetry without repetition in corresponding parts.

DRY ROT IN THE GLASGOW MUNICIPAL BUILDINGS.

AT the monthly meeting of the Glasgow Town Council on the 5th inst. among the business done, according to the *Glasgow Herald*, was the consideration of the minutes of the Municipal Buildings Committee of December 29, which contained a report by the city engineer on the ceilings of the City Chambers. The report stated that:—

The reporter had directed 35 plain-plastered ceilings of apartments, corridors and staircases to be laid bare and replastered. The examination of these ceilings, when they were exposed, showed in every instance the presence of dry rot in a more or less aggravated state of development. In one case the decay was so far advanced that part of a ceiling fell while the workmen were engaged removing an adjacent part. The fungus of dry rot has been more abundant in the ceilings of the corridors than in the apartments, and it now seems probable that

decay may be found in some ceilings which were formerly believed to be sound, although these will not be taken down until a further examination has been made. The incompleteness of the result of partial examination makes it extremely difficult to arrive at a satisfactory determination as to the actual state of the ceiling timbers. This was illustrated very remarkably one day this week, when a piece of timber, which had formed the support of a cornice, was found in a state of absolute decay at either end, the centre of the timber being to all appearances perfectly sound. The ceilings which have been already dealt with include all the rooms and corridors, and the staircase of the Town Clerk's office, the chamber keeper's room, Mr. Lang's office and the rooms adjoining with corridor and lavatory, the staircase giving access to the Master of Works' office, and two of the rooms occupied by his staff. The examination of the public offices of the gas and water departments has not meanwhile disclosed any apparent defect, but, in the opinion of the reporter, the whole matter should be continued for the further consideration of the sub-committee.

The committee remitted the matter back to the sub-committee for further consideration.

Mr. Wallace moved the approval of the minutes. Mr. Holmes seconded the motion.

Mr. Gray moved as an amendment that it be remitted to the committee to have interviews with the architect, inspectors, joiners and plasterers for their explanation as to the condition of the ceilings of the buildings at the present time. After the liberal expenditure in connection with these buildings it was most humiliating to have such a state of things existing as was now contained in the report of the city engineer. The Council should take up the position of having an explanation from the persons who ought to be able to say something about the condition of matters. They paid the joiner 80,000*l.*, the plasterers 18,000*l.*, and to the architects, inspectors and measurers 26,000*l.*, and these persons ought to give some explanation. The committee were previously empowered to get an examination made of the ceilings, and to take other steps as they might consider necessary. He did not know whether the committee had taken any further action, and, therefore, in the interest of the public, these parties should come forward and handsomely donate a sum of money for the erection of the fountains.

Bailie Brechin seconded. No stone should be left unturned to find out the cause of the present condition of matters.

Mr. Mayberry expressed the hope that the Council would remit to a committee to have a thorough investigation from beginning to end.

Mr. John Murray asked if the various tradesmen had been dealt with direct, and if the work had been accepted from them as finished, and the accounts settled? If that was the case, what was to be the result of Mr. Gray's inquiry.

Mr. Battersby asked if the Council or the committee who had charge of the erection of the buildings accepted the contracts from the joiners, plasterers and others, or whether it was one firm that was responsible for all the others?

The chairman (Bailie McLennan) said that in most cases the contracts were entered into direct between the Municipal Buildings Committee and the various contractors.

Mr. Steel suggested that an independent report should be obtained as to the condition of the building, the cause of the defects, and who was to blame.

Bailie Wallace, convener of the committee, said that the architect and the contractors had already been communicated with. He had, however, no objection to go over the same course again, and report to the Council. He might state that all over the country there were cases of buildings in the same position.

The Chairman asked, seeing that the matter had been gone into as the convener explained, if it would not meet Mr. Gray's view if the convener undertook to report the result of these investigations at next meeting.

Preceptor Dickson remarked that they had a committee in charge of the erection of the buildings, they employed inspectors, and they had an architect to whom they paid a very large fee. In these circumstances it was an extraordinary thing that they could not put up a building without the whole thing going to wreck and ruin. The Council should, therefore, have a thorough report on the whole matter.

Mr. Mitchell thought they should have a report from an independent authority. Surely they could saddle the blame on somebody, and perhaps get something back.

Mr. Martin did not think there was any necessity for the motion of Mr. Gray, because the committee had already had interviews with the architect, and had heard his explanation. No fault attached to the joiner, the plasterer, or any of the tradesmen. The matter complained of had arisen through the architect departing from that original plan of plastering in the corridors. For the purpose of deafening the rooms he inserted dooks into the concrete, instead of plastering on it, as originally intended. This was the reason for the dry-rot getting into the building.

Mr. Robert Anderson said the architect stated that the alteration to which Mr. Martin referred was done under the

approval of the Municipal Buildings Committee. No trace could be found of any such authority being given, and if the architect acted without authority of course he was morally responsible. Unless they were prepared to enter on litigation with the view of recovering something from the architect, he thought there was not any use of going further.

Mr. Mitchell proposed, as a further amendment, that it be remitted to the committee to obtain an independent report as to the cause of the dry-rot in the building.

Mr. Walter Wilson seconded this amendment.

Mr. Ure thought an independent report was unnecessary. They had full confidence in the city engineer.

Mr. Dickson thought if the committee put in the minutes all the information they had obtained that would be sufficient.

Mr. J. W. Dick thought that what they had to see to was to get the damage repaired without further expense being incurred.

Mr. Sinclair urged the convener to take the matter back and to bring up a new report.

Mr. Gray said he wished to have a vote, but ultimately, on Mr. Wallace agreeing on behalf of the committee to bring up a report embodying all the information they had received, both amendments were withdrawn and the minute was approved.

TESSERÆ.

The Greek Lesche.

THE Lesche has been represented as an oblong court, the longer sides of which were appropriated to the paintings and the front ornamented with an open portico. From the very general application of the word, frequently to buildings which had been erected for other purposes, it is uncertain whether any edifices were raised with the sole object of being a place for lounging and conversation, and whether such edifices had any distinct peculiar form. Certain it is that no buildings in all Greece are preserved to us of this nature, although we are informed that at one time they were of so extensive an use that in the city of Athens alone there existed no less than 360. But as it is possible that buildings may have been expressly constructed and set apart for such a destination, and as one of the most striking excellences of Grecian architecture was the appropriateness of each building to its specific purpose, and as the descriptions of some of these buildings do appear to correspond together, so we should endeavour to ascertain what form of arrangement will best combine to answer the various requirements of such a building. The first particular we have of the Greek Lesche is that it was a building without doors. A modern building which has much of this character is the Ruhmeshalle, or Hall of Renown, at Munich. It has nine columns at the flanks and seven inside. The columns are 4 feet 1½ inches in diameter, English measure. We have here a building of important dimensions and decorated with paintings, but having neither door nor chamber. From Hesiod we learn that it was warm, and that in winter time any close warm room to which people resorted constituted a Lesche. From this passage Siebelis conjectures that the Lesche was not *ἀθύρωτος*, but closed in on every side. This, however, does by no means follow, for the building might have been of any form, and opened or closed indifferently provided it was warm. The Lesche was, moreover, sunny, and resorted to by old men, who loved its genial warmth and could take their gentle exercise in its porticoes or enjoy quiet and repose on the ample seats. The most general, and indeed as its name denotes, the most apparent destination of these buildings was for the purposes of conversation. From Plutarch it appears to be a place of assembly and conversation. From "Ei apud Delphos" and from Suidas, a place for disputing on scientific and philosophical subjects. From Proclus it seems to have been devoted to any profitable conversation. Poems were recited in them, and even Homer is said to have sung his verses in the Lesche of Cyma. From Eustathius, Proclus and Moschopolus we may gather that they were frequently diverted from these intellectual occupations to idle gossiping and chatting. Pausanias, in his description of this at Delphi, says they were used for idle and serious conversation. Antiphon, again, calls the Lesche a place for lounging; Harpocration, a place for idle people; while Homer, Hesiod and their commentators make it a place of resort for beggars. From these several authorities it would appear that the Lesche was provided with ample seats, which might be placed in recesses, called *exhedræ*. Another feature of the Lesche was probably a long ambulatory or colonnade for the philosophers to exercise and enjoy themselves in. The Lesche appears to have been generally painted, and therefore frequently called *Pœcile*, or enriched with a variety of ornaments such as paintings. The latter building appears to have consisted of a *stoa*, or portico, which would naturally be suitable to the purposes of a Lesche, so that we may conceive that these buildings were frequently identical. Pausanias informs us that the Lesche at Delphi was decorated with pictures, and that the

stoa at Athens and one at Elis were called *Pœcile* because decorated with paintings, and that one of the two Lesche at Sparta was also called *Pœcile* for the same reason. Lastly, the portico in Hadrian's Villa, which has been taken as the type of the Greek Lesche, is called the *Pœcile*, and the *Pœcile* was among the buildings executed at Tivoli by the Emperor Hadrian. Another important circumstance connected with these buildings is that with the exception of the Lesche at Delphi, which had a painting on each side of the wall, all the other instances referred to by Pausanias had but one painting, or one wall decorated with paintings, which, if we may judge from the Long Portico at the Piræus, was executed on the southern or principal side. Thus, although Pausanias describes at length the paintings in the *Pœcile* at Athens, painted by Polygnotus, Micon, &c., in a portico at Athens painted by Euphranor, and in the Long Portico of the Piræus painted by Leochares, he describes only the painting or paintings on one wall in each of these edifices. It is probable that all these buildings were ornamented with statues. The Corcyrean portico had statues on each side of the wall, and Pausanias incidentally notices certain statues in the Royal Portico at Athens, in the *Pœcile* of that city and in the *Pœcile* at Elis. Among other decorations the *Pœcile* at Athens was ornamented with shields and other spoils.

Gibson and Thorvaldsen.

In some instances the works of John Gibson have been compared with those of Thorvaldsen, and a certain identity of career and character may be traced in many points between them. Gibson, however, gains by the comparison. Both sprang from the lowest class of society, and both found their true home and inspiration in Rome; but Thorvaldsen was brought there by no aspiration of his own, and almost against his will. Gibson never rested till he had, as it were, worked out his passage to the great goal of his ambition. Both were either sculptors or nothing; but Thorvaldsen was phlegmatic and laggard in his work. Gibson had a will which never flagged in the fulfilment of his obligations. Both were easily imposed upon, but in Thorvaldsen's case credulity was accompanied by a strong mixture of suspicion. Friends knew all that was in Gibson's mind. No friend ever penetrated into the secrecy of Thorvaldsen's. Both were childlike in indifference to outer appearances, in ignorance of business, and forgetfulness of their dinner engagements; but Thorvaldsen only mistook at which great house he had to dine, or never rightly understood where he had been dining; Gibson forgot that he had to dine anywhere at all. When they are both designated as childlike, and the charm that each possessed in that respect is admitted, it must be remembered that that characteristic includes somewhat that, in a man, is neither pleasant nor convenient. The indulged child is generally ungrateful, the praised child vain. Neither of these great artists was entirely free from the fault or the foible. But, as regards the fault, Gibson must not be included in the same category with one who kept his first patron—him from whom, humanly speaking, all his subsequent success flowed—waiting twenty-six years for the fulfilment of his engagement. Further, neither were tested in their lives and conduct by those family obligations which are entailed by marriage; but Gibson, at all events, did his duty by such as belonged to him, while Thorvaldsen let his own father die in an almshouse, while he supported the faithless wife of another man. Finally, both bequeathed their works and their fortune—Gibson nearly all, and Thorvaldsen nearly half of his—to the academy of their native country; in Thorvaldsen's case to be received with gratitude and augmented with liberality, in Gibson's without any token of adequate recognition.

Assyrian Records.

The public records of the Assyrians were engraved on stone, for which the arrow-headed character, from its simplicity, was peculiarly well adapted, and were usually placed on the walls of temples or palaces, and on rocks. For private as well as in some cases for public purposes, two other materials appear to have been used, baked clay or terra-cotta, and rolls of leather or papyrus, as in Egypt. In the first case the letters were stamped or incised with a sharp instrument upon the moist clay, moulded into the shape of an octagonal or hexagonal cylinder, or into square or oblong tablets, and then baked in the furnace. An immense number of such documents have been discovered in Assyrian and Babylonian ruins, and a large collection is now in the British Museum. The cylinders are historical and are inscribed with the records, in the shape of annals, of various kings of Assyria, by whose orders they appear to have been distributed amongst the different cities of the Empire, to be deposited, it may be conjectured, in the public archives. The smaller tablets are mostly of a more private nature; some are evidently contracts for the sale of land or other property, and have upon them impressions of seals and the names of witnesses; others appear to commemorate dedicatory offerings to the gods; others again have chronological tables and astronomical calculations which will probably prove of great value;

and upon some have been detected alphabets and apparently lessons in grammar or spelling. In fact, there is reason to hope that they form almost a complete Assyrian library, furnishing us with a vast amount of information regarding the history, sciences and customs of the Ninevites. No remains of the scrolls of parchment or papyrus have been as yet discovered; they have probably all been destroyed by time, but seals once appended to such documents have been found in considerable numbers, and in the bas-reliefs officers are continually represented as registering on such scrolls with a pen or stylus the amount of the slain and of the spoil after a battle.

Mediæval Coloured Decoration.

If we take a series of examples of coloured decoration, we find that there are two broad styles, one which we may call the Norman style, reaching down to the time of Henry III., and a second reaching down to late in the fifteenth century. The Norman style seems to have been adapted to the tastes of those who had been accustomed to see colour produced by the use of different constructive materials. An arch, for example, which we should treat as a great banded bow, with concentric lines of colour, is often under the Norman style treated as if it were of different coloured stones, and is painted accordingly, with the alternate voussoirs of different colours; and at Winchester we even find a label moulding divided into spaces to match these voussoirs, and painted of contrasting colours, *e.g.* where two neighbouring voussoirs are red and green, the adjoining spaces of label will be green and red. In the coigns of openings also the same principle obtains, and one stone is painted red, another yellow, and the next green. We also commonly find produced in painting those forms with which we are familiar in sculpture. The usual chevron moulding, for instance, is frequently reproduced in colour. The effect of sculpture is also frequently heightened by tinting it with colour. The capitals of pillars also are sometimes painted. In one instance the groining of the roof is heightened by lines of red, with yellow at the intersections, producing an agreeable relief to the stone colour. In the second style, which obtained in the fourteenth and fifteenth centuries, we find the ground of parchment colour often diapered with roses, fleurs-de-lys, or other patterns. Sometimes those patterns are enclosed in a kind of frame, as if intended to imitate pieces of tapestry work. It is in this style especially that we find historical painting introduced for wall decoration. For the most part subjects are drawn in outline only, with washes of colour in the drapery of flat tints of low tone. These paintings are arranged in various ways on the walls. At Wiston, Suffolk, they are arranged in panels under a painted arcade, which runs round the walls between the windows. At Headington, Oxon, they are placed upon the splays of the windows. In some other churches they are between the clerestory windows, in others in the spandrels of the nave arcades. In a chapel at St. Brelade, Jersey, they are arranged in three lines in the vaulted roof over the windows, and run in a continuous line, like the subjects in the Bayeux tapestry or the sculptures in the Salisbury chapter-house. Still more frequently we find these wall-paintings placed on the walls of different sizes, without any principle of arrangement or any connection of subjects, as in the heterogeneous collection in a modern picture-gallery.

The Chapel of the Nine Altars, Durham.

The Chapel of the Nine Altars is in seven divisions, formed by lofty clustered piers of stone with slender detached shafts of Frosterley marble, all united together under one capital. The piers are banded on a level with the string course at the base of the lower stage of windows, and again midway between that and the capitals. The central division is of the same width as the choir, and has three lancet windows to the east, with slender attached clustered and banded shafts in front of the window jambs and supporting their arches, the architraves of which are enriched with the tooth moulding, and terminate in corbel-heads. Single lancet windows of similar character and decoration occupy the lower stage of all the other compartments on the eastern side. Corresponding windows, of a smaller size, occupy the upper stage of the divisions, excepting the central one, which is entirely filled by the magnificent marigold or Catherine window, which gives character to the eastern termination of the building. Its tracery was restored with tolerable regard to the period to which it belonged, about the year 1795. It consists of an outer circle of twenty-four lights, and an inner one of twelve, radiating from a foliated circle as their common centre. The painted glass with which it was originally filled by the liberality of Richard Pickering, rector of Hemingburgh, between the years 1409 and 1413, has perished, and has been replaced by the fragments of that which once adorned the other windows of this chapel. Previously to the alterations in 1795 these windows were filled with tracery of the Perpendicular period, the work of Prior Wessington, and were adorned with painted glass, representing the legendary history of the saints whose altars stood beneath them. Wessington's tracery was not restored, and the whole range of

the eastern windows of the nine altars now appear in their original Early English character. The Perpendicular tracery of the windows at the south end was sedulously recopied when that part of the building was restored in 1827. The great window of the north end was called Joseph's Window, from the history of that patriarch being therein depicted. It is of Early Decorated work, and is singularly interesting for the beauty and simplicity of its Geometrical tracery. It may be further remarked (to use Mr. Billings's words) that "it is perfectly unique in the repetition internally of the great ribs of the tracery supported on clustered columns, the latter being connected with the mullions by through stones at five different places, which add materially to the strength of the whole. There is an iron bar which appears to be original, acting as a tie, running through this internal tracery and resting upon the capitals." An arcade runs round the whole of the lower part of the interior, consisting of a series of trefoil-headed arches, supported by slender detached single shafts of Frosterley marble. The hood mouldings of the arches terminate in corbel-heads of various device, kings and bishops and cowed monks—most of them, unfortunately, sorely mutilated. The space above, between the arches and the string-course, at the base of the lower windows, is occupied by a range of quatrefoils, sunk into the wall, with bold projecting mouldings. The altars have evidently been an integral part of the original design, as may be seen by the most cursory observation of the manner in which the arcade is made to adapt itself to the places which they occupied.

The Parvis of Peterborough Cathedral.

The construction of this elegant little edifice is extremely scientific, especially in the manner in which the thrust is distributed through the medium of the side turrets so as to fall upon the buttresses in front. These turrets being erected against one side of the triangular columns on the right and the left hand support them in two directions at once, *viz.* from collapsing towards each other and from falling forward. The latter pressure is thrown wholly upon the buttresses in front, which project 7 feet beyond the base of the great pillars. The style of this parvis on the whole is Decorated, and not Perpendicular, as some have thought, judging too exclusively by the lines of the window tracery. The form of the entrance archway (which is not four-centred, but pointed-segmental, just passing into the former by rounding off the inner order of mouldings at the point of contact with the impost), the details of the capitals and groin-ribs, the plan of the vaulting, the panels and canopies of the front, and the later forms of the curvilinear tracery point to about the year 1370 as the date of its erection. Many critics have objected to this parvis as an unsightly incumbrance in its present position, considering that it violates the uniformity of design displayed in the west front. The principal matter of regret perhaps is the concealment of the upper part of the great inner doorway, which probably yet retains some interesting sculptures and enrichments above the central dividing shaft, like the quatrefoil in the great west doorway of Croyland Abbey. It is likely, however, that its insertion was not a question of taste, but of necessity for the safety of the fabric.

Greek Colouring.

The Greeks applied colour with the particular object of clearing out and rendering their detail more distinct; the Saracens covered the entire surface of their buildings with colour, whether in the intricate moulding or the flat surface, but always in strict architectural arrangement; while the Gothic architects frequently employed coloured decoration without reference to the form, as in clustered columns, which are frequently covered with large diaper work. In the Greek temples we admire how the sculptures are brought out by a blue ground, how the horizontal line of the sculpture on the cella wall brings out the perpendicular lines of the columns in front, how the architects endeavoured to "neutralise" the confusion arising from a grove of columns in the pronaos and posticum of their temples, how the indistinct forms of the mouldings and ornaments in the soffits were lightened and picked out, and, to select one instance, how in the Erechtheum the dark confused shade produced by the great projection of the northern portico was remedied by the aid of toreutic art. The walls of Ecbatana were painted white, black, purple, blue, orange—and the last two were silvered and gilt. At Athens were two tribunals, the green and red, clearly showing that these colours were the predominant ones employed in those particular buildings. What constitutes the charm of the houses at Pompeii is the variety of decoration which abounds in them. They did not select any set colour or design which they conceived to be the most beautiful and adhere to that invariably, but they endeavoured to give a different character to each portion of the house. What can be more beautiful than the chaste arabesques on a white ground which decorate the tablinum of the Casa delle Capitelli Colorati, unless it be the more celebrated arabesques on a black ground in the house called, in consequence, Casa della Camera Nera?

ILLUSTRATIONS.

THE STAIRCASE OF FRANCIS I., CHATEAU DE BLOIS.

THE castle of Blois is mainly the work of LOUIS XII., FRANCIS I. and GASTON, of Orleans. The part erected by FRANCIS I. is generally most admired, and among all the staircases not one has been so often drawn as that which we illustrate this week, and which is the central point of one façade. In a country where so much of life is spent out of doors it was an advantage to have free access to the balconies, and Blois is not the only case where the approaches are open. The raking lines, instead of horizontal, were inherited from Gothic rather than from Classic times. The figures under canopies are the work of JEAN GOUJON. He may also have carved some of the salamanders of FRANCIS I., a device that is found throughout the parts which the king had erected. It has not yet been discovered who is the author of this admirable work. Among the scenes of which Blois was the theatre was the murder of the Duke of GUISE. The Vieux Cabinet, where the tragedy took place, was approached by this staircase.

TATE CENTRAL LIBRARY, BRIXTON.

THE new library recently erected at Brixton, and illustrated in this number, is from the architect's drawing, which was exhibited in the last Academy exhibition. The building (with site) was presented to Lambeth by Mr. HENRY TATE, and was carried out from the design and under the superintendence of Mr. SIDNEY R. J. SMITH, F.R.I.B.A. (the architect of the new picture gallery which is being built at Millbank). The cost of the library and site was 15,000*l.* The red bricks are from Elham Valley, the stone in the facings is Portland and Beer, the fittings, news-stands, tables, counters, &c., are all carried out in polished walnut. The dimensions of the main rooms are as follows:—Magazine-room, 35 feet by 27 feet; newspaper-room, 45 feet by 35 feet; lending library, 46 feet by 37 feet; reference library, 85 feet by 28 feet; and book store, 46 feet by 38 feet. In the basement are book-stores, binding-rooms, strong-rooms, &c., and at the side is the librarian's house. The carving was executed by Mr. C. SMITH, the heating and lighting by Messrs. Z. D. BERRY & SONS, and the ironwork construction by Messrs. DENNETT & INGLE, Messrs. WAYGOOD for lift fittings, and Mr. STONE for the iron railings and staircase railing. Messrs. F. & H. F. HIGGS, of Station Works, Loughborough Junction, were the contractors. This is the third library, so generously given by Mr. TATE to South London, that has been carried out by Mr. SMITH.

The Imperial Institute.—We omitted to state last week that our illustrations were reproduced from photographs by Messrs. Bedford Lemère & Co. But it was hardly necessary, for as their plates are superior to all others in this country, copies from them can be easily recognised.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. Macvicar Anderson, president, in the chair.

Medals and Prizes.

The award of prizes was read as follows:—

Silver Medal and Ten Guineas (Drawings)—George S. Hill (Glasgow).

*Soane Medallion and 100*l.**—Arthur T. Bolton, Associate. Medal of Merit and ten guineas: James Scott Stewart. Medal of Merit: Alfred C. Houston, Associate (Ashpitel Prize).

Pugin Studentship—John James Joass. Medal of Merit: Thomas Arthur Sladdin. Hon. Mention: Harold Brakspear.

Owen Jones Studentship—Alfred Hoare Powell.

Godwin Bursary—Banister F. Fletcher, Associate.

Tite Prize—Charles A. Nicholson. Five guineas: R. S. Dods.

Grissell Medal—(Not awarded). Five guineas to Mr. W. Tait Conner, Associate.

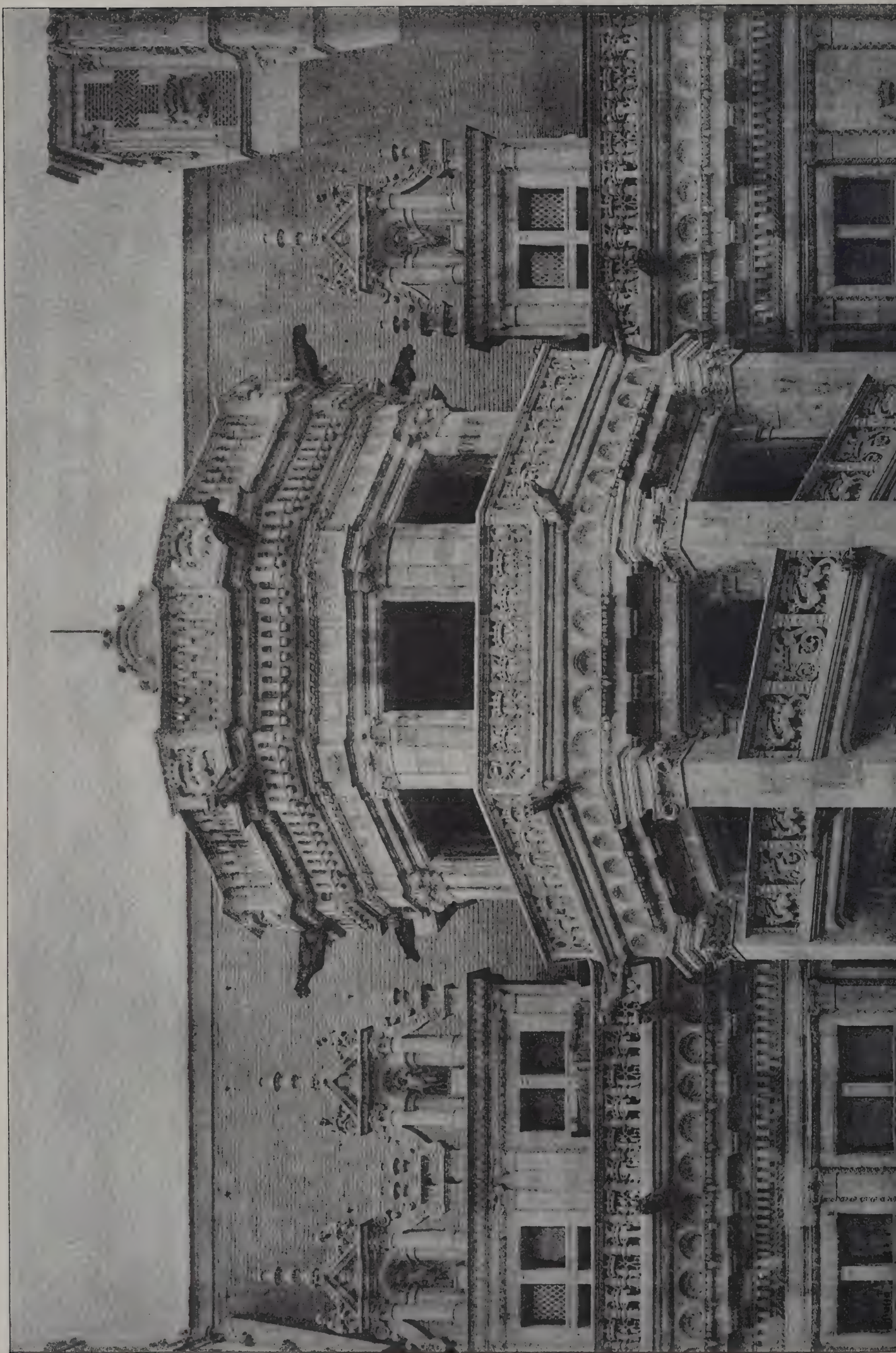
Two Essayists five guineas each: C. Bernard Hutchinson, T. Rowland Hooper.

Mr. ANDREW N. PRENTICE, Soane medallist, then read a paper, of which the following is an extract:—

Tours in Spain and Majorca.

Mr. Prentice, in his introductory remarks, said he considered no country in Europe possessed the same variety of styles as Spain; and Seville was one of the most interesting of its cities—a city in which the hands of the Moor could be traced in the tortuous and narrow streets, the courtyards, the ancient walls and aqueducts, and lastly the famous tower of the Giralda. The original tower was built in 1196 by the Moors, and was of the same height as the campanile of St. Mark's; the Renaissance work was added by the architect, Hernan Ruiz, in 1568, and though considered by some to have spoilt the proportions of the tower, it was to the author's mind a very picturesque object. The sacristy of the cathedral was a spacious apartment in the Renaissance style, while the Sala Capitular was more beautiful and refined. The latter was in the form of an ellipse, the ceiling, pavement and walls being decorated in the most splendid style. Through the instrumentality of the Institute Travelling Card he obtained permission to measure the great screens around the high altar. After the cathedral the Alcazar was the next building of importance, and he had spent several weeks making sections and plans of its beautiful details. It was a large Moorish building somewhat later in date than the Alhambra, and, though smaller, equally fine. The entrance gateway was magnificent, and there were more variety of wall tiles than at Granada, of which he had taken full-size rubbings. Much of the original colouring remained in spite of the cruel whitewashing to which the building was subjected in 1813. Another palace in Seville in a semi-Moorish style was the Casa Pilatos. It had a large courtyard some 50 feet square, the walls of which were covered with tiles to the height of 10 feet. The Casa Ayuntamiento was a very fine specimen of the Plateresque style, and worthy of mention. Although familiar with the appearance of the Alhambra from photographs and books, any one entering its courts for the first time could not but be carried away by the novel surroundings, and interest was at once awakened as a new-found treasure. After Seville he, at first, had the idea that the Alhambra was a blaze of colour; but, with a few exceptions of decoration, the delicate traceries and walls were of a creamy and white colour. If the Alhambra had ceased to charm the architect at home, from the many vulgar attempts at its reproduction, still, any one with a soul for the artistic could not fail to appreciate the wonderful grace of form in the proportion of the arches and openings. A careful study of any of its parts was a useful lesson to the student; the Hall of Ambassadors, for instance, the entire surface of which was a mass of decoration, still it did not appear in the least degree overdone. This effect, he thought, was gained by the variety of the ornament, and the mode of placing a large pattern next to a small and intricate one. The advantage of beginning at the floor level with a delicate arabesque, and increasing in boldness as it ascends, also became apparent. Under Italian influence the still unfinished Renaissance palace of Charles V. had been begun in 1526—a building unique in Spain both for its style and plan. Built in close proximity to the Alhambra, Spaniards seemed to have taken a dislike to its formal style, and had evidently preferred to imitate their own buildings, their sympathies lying more with the Moorish work. Having drawn attention to the many points of similarity between the Moorish and Renaissance work—notably in the increasing boldness of the arabesques the further they receded from the eye, and in the mode of lighting, he considered a careful study of the plans of Moorish buildings of great value and interest. Nothing was haphazard. The doors and halls were arranged on a central axis producing charming vistas, while, no matter what size the houses were, they all had courtyards, varying from 6 feet square, as on the Torre Captiva, to the large Court of the Lions, 116 feet by 66 feet. During a stay at Cordova he made a study of the entrance to the Holy of Holies in the mosque—a most impressive piece of decoration. Besides the mosque, many instructive lessons might be gained by an exploration of the town. His first impressions on arriving at Toledo were disappointing. Coming from the south, where the houses and streets were bright with colour, Toledo looked grey and cold; on returning after a journey in the north his impressions were completely reversed. It contained many specimens of the Early Renaissance work. The popular idea that Spain was the country *par excellence* of the grotesque in Renaissance architecture he was well aware of, and he knew few countries where the spirit of *abandon* was so completely displayed. But when the Renaissance in Spain was analysed it was found that it was divided into three distinct periods—the Plateresque, the Græco-Roman or Estelo de Herrera, and the Rococo or Churrigueresque. The principal buildings in Toledo described were the Hospital of the Holy Cross, the Alcazar, and the cathedral, which contained numerous iron screens of the Renaissance period. The study of such screens he had followed up at the cathedral of Cirenca, where the finest collection in Spain was to be found, and where the interior was a perfect mine of Renaissance detail in stone, wood, iron and rich jasper. Madrid possessed few ancient buildings of note, but

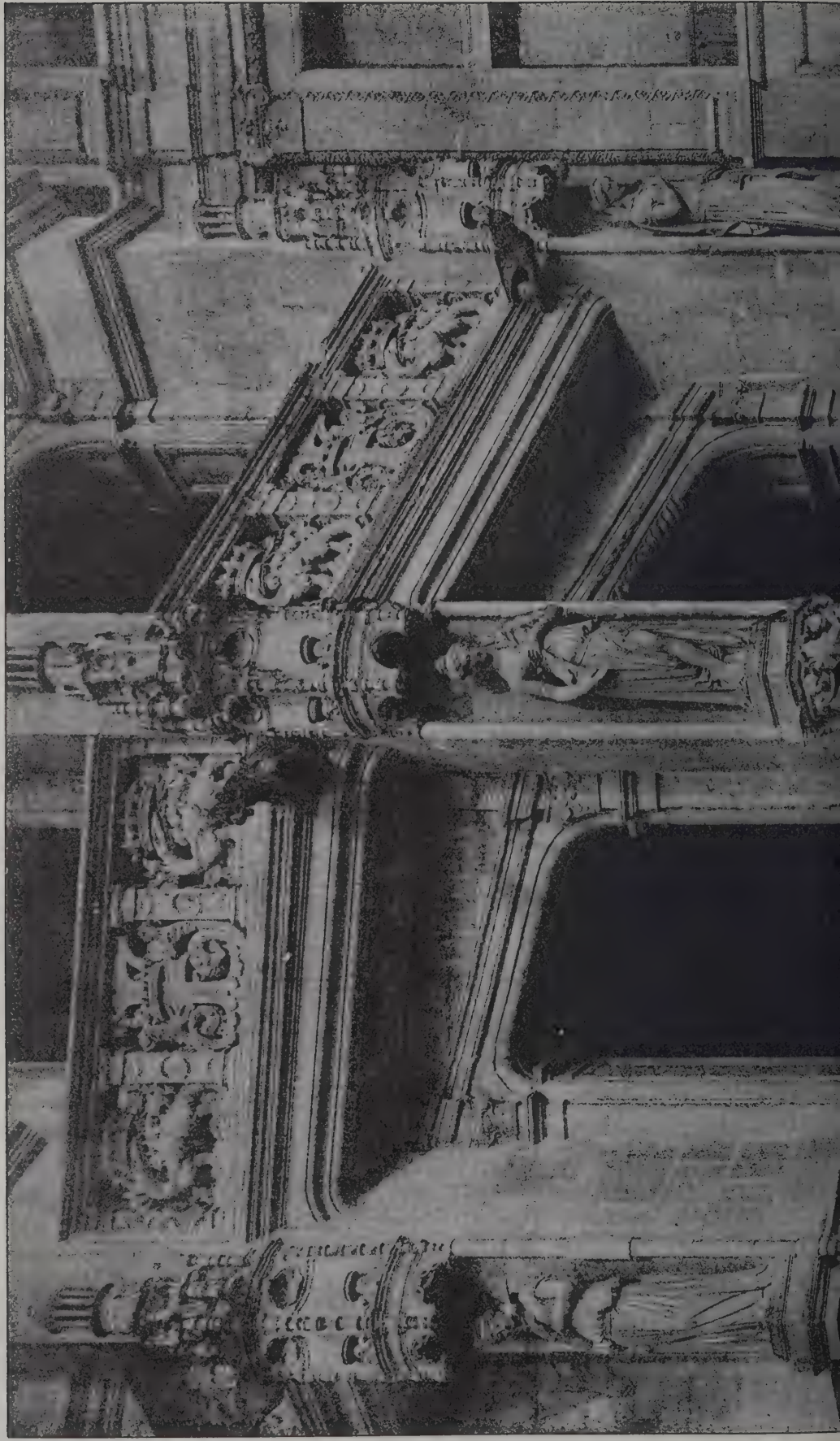
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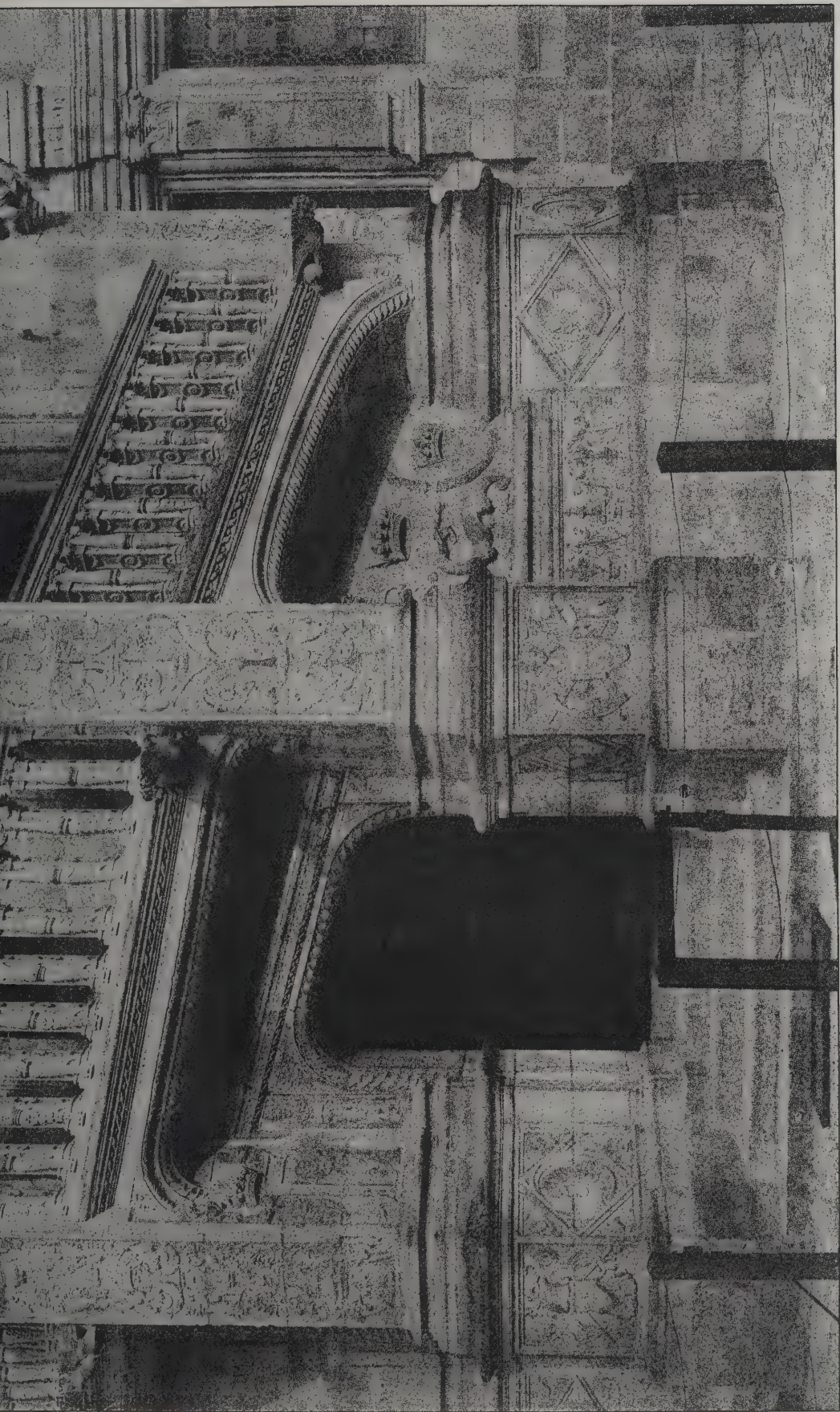




STAIRCASE OF FRANCIS I., CHÂTEAU DE BLOIS.

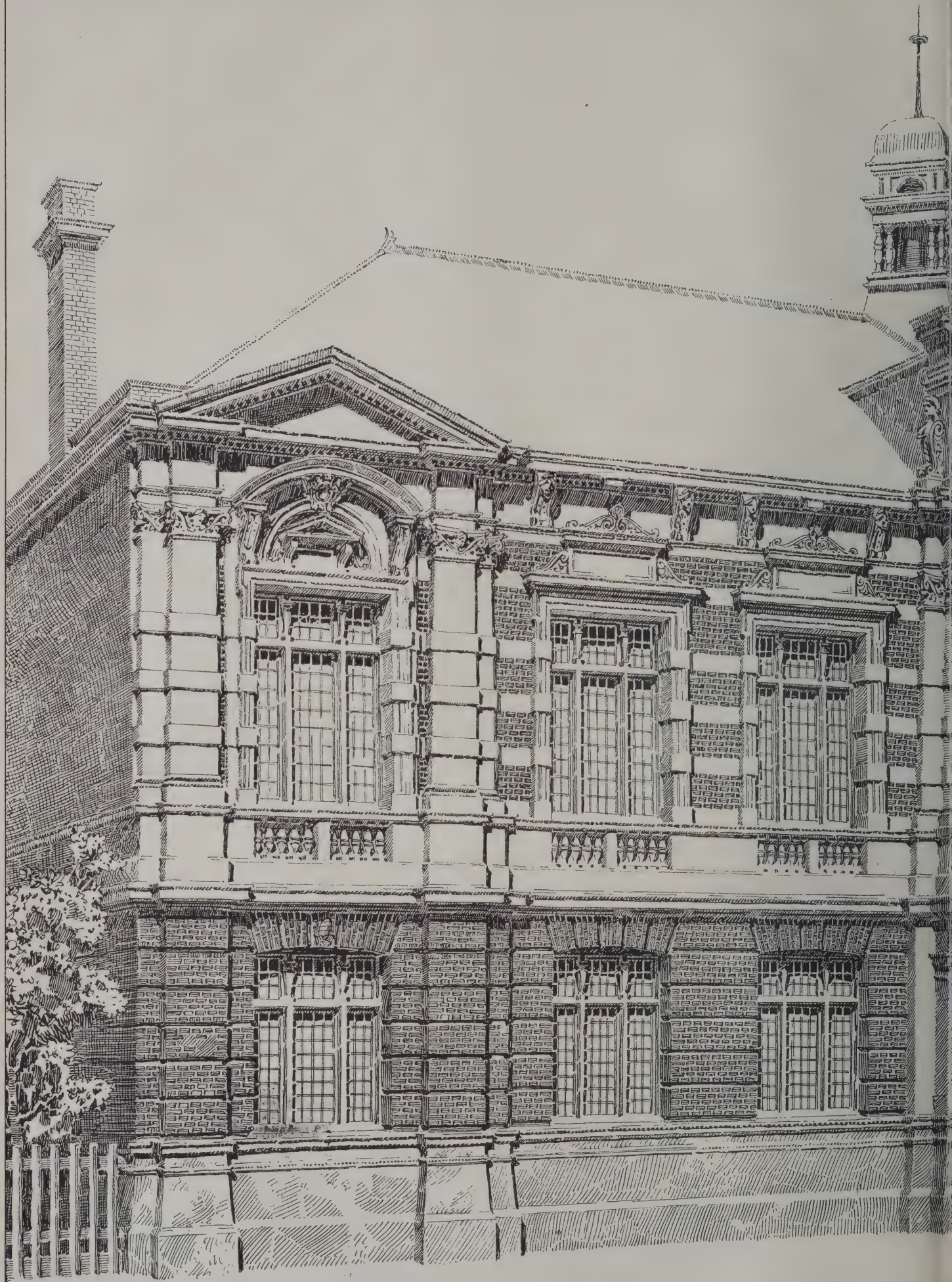
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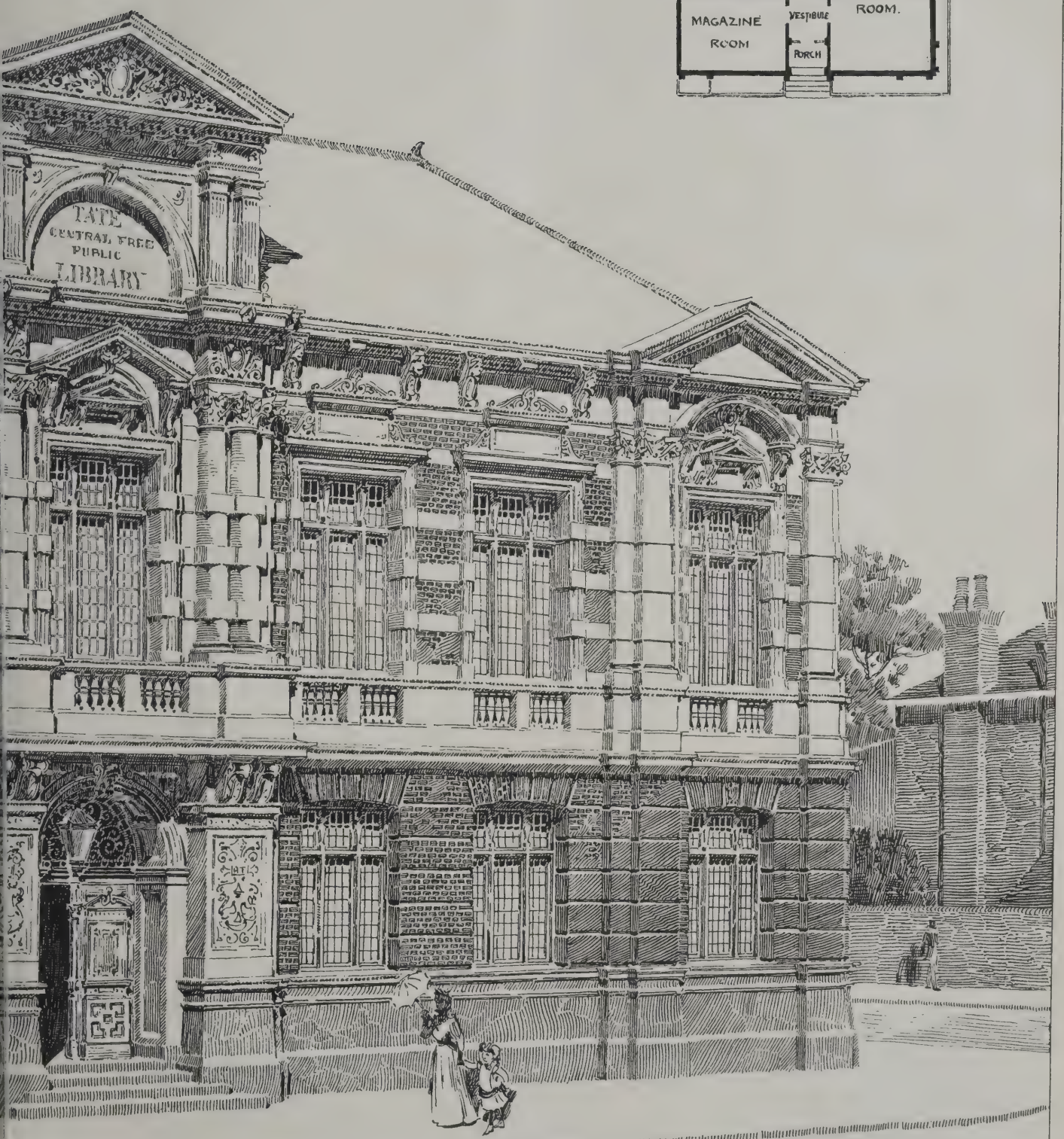
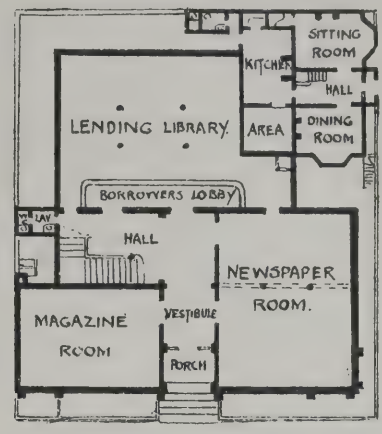


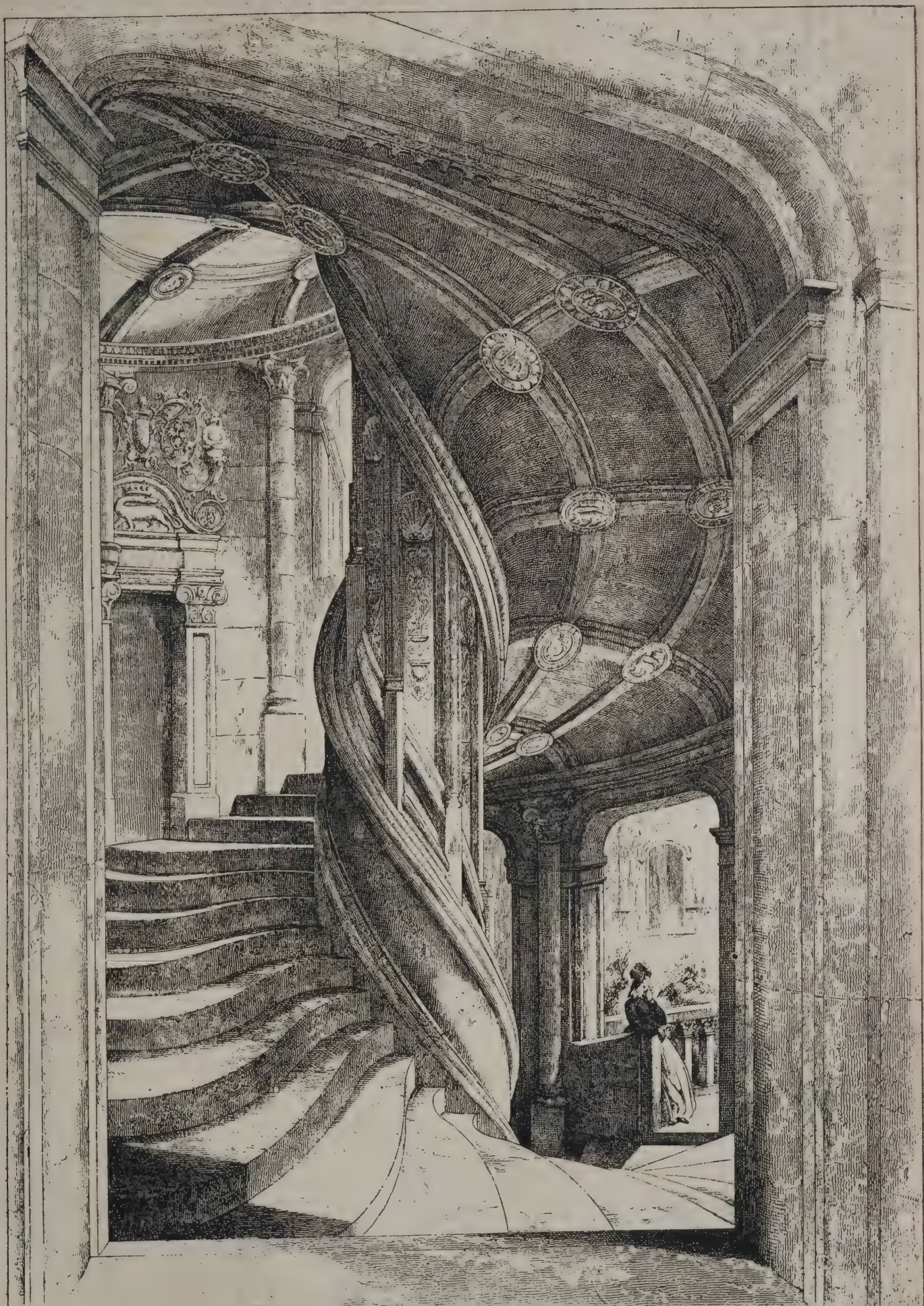


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STAIRCASE OF FRANCIS I., CHÂTEAU DE BLOIS.
LOWER PART.







STAIRCASE OF FRANCIS I., CHÂTEAU DE BLOIS.

(From a Water-Colour Drawing by Mr. Waterhouse, R.A.)

several modern buildings had sprung up of late, constructed on the most approved fireproof principles, such as the Bank of Spain, a large new railway station and buildings connected with the municipality. Salamanca, after Seville, was the most interesting city in Spain, and might justly be called the home of the Renaissance. In the cathedrals of Spain the choir was situated in the nave, but in a number of smaller churches, and especially in conventual buildings, it was placed at the extreme west end. The journey to Leon and Santiago de Compostilla should not be missed; the latter place had a distinct character of its own, nearly all the houses being of granite and the street being lined with arcades. From Burgos he had brought several sketches of the local Renaissance, and the cathedral at Sigüenza, a city not often visited, contained many gems of Plateresque work. Owing to the absence of stone in the locality of Saragossa most of the houses were built of flat bricks crowned with wooden cornices. Of the many monastic buildings in Spain the Benedictine monastery of Poblet, now in ruins, was the most interesting and extensive after the Escorial. From Barcelona Mr. Prentice proceeded to Palma, in Majorca, where subjects for sketching were innumerable, from the large cathedral down to the door-plates of the houses. His object while in Spain had been to study and sketch as much of the architectural remains as time permitted, as he was conscious that the past was being trampled out of the country and many ancient buildings rapidly disappearing.

The paper was illustrated with drawings made by Mr. Prentice and Mr. Heber Rimmer.

A vote of thanks proposed by Mr. R. Phené Spiers and supported by Mr. Dawson, Mr. Blashill and Mr. A. Payne was unanimously accorded to the reader of the paper.

ARCHITECTURE IN DUNDEE.

A MEETING of the Dundee Institute of Architecture, Science and Art was held last week, Mr. W. Mackison, burgh engineer, president, in the chair. Mr. A. H. Millar, F.S.A.Scot., read a paper on "Curiosities of Architecture in Dundee."

Mr. Millar said there was a widely-spread opinion on both sides of the Border that Dundee was a mere burgh of yesterday, a place which had risen into importance during the present century, and which had no ancient history worth speaking of. This delusion had probably arisen from the fact that the increase of Dundee through the development of her commerce and manufactures since this century began had been phenomenal, and almost without a parallel in the kingdom. It could be proved from documents in existence that Dundee was regarded as a centre of commerce when Scottish trade was in its infancy, and that it was considered by the sovereigns of ancient times as one of the most important east coast burghs. From papers still existing in London it could also be proved that a regular trade was carried on between Dundee and that city towards the close of the twelfth century, and it might be remarked that this was an earlier date than had been found in connection with the commerce between England and any other Scottish town. Without dealing with the literary evidences of Dundee's antiquity, Mr. Millar said it was his purpose rather to trace the development of Dundee from early times to the present day by means of existing or recently existing buildings, to contrast the civic life of former times with that of our own day—to give, in short, a brief sketch of the history of Dundee in stone and lime. For that purpose the lecturer then had thrown on the screen a long series of excellent lantern-slides, arranged in chronological order. There was first exhibited a series of views of genuine old buildings, including the Old Steeple, Our Lady Wark; the old Custom House, known as Drummond Castle; Dudhope Castle, the Franciscan Nunnery, the Wishart Arch, and several of the carved stones now preserved as relics in the Old Steeple Museum. These, said the lecturer, brought them from the thirteenth to the close of the sixteenth century. A new era in the architecture of Dundee began with the work of William Adam, a name familiar and renowned in the history of Scottish architecture. The Town House was erected from his design in 1734, and the revolution in style which he then introduced had marvellously affected the architecture of Dundee even up till the present time. Views were then shown of a number of representative buildings which, the lecturer stated, were either confessedly modelled upon Adam's style or were unconscious imitations of it, such as St. Andrew's Church, the Trades Hall and the Union Hall, the two latter having been expressly designed so as to agree with the frontage of his Town Hall, near which they stood. As an example of the far-reaching influence of this architect Mr. Millar referred to the latest church erected in Dundee, the Gilfillan Memorial, in Whitehall Street, in which, he said, some of the most characteristic features of Adam's style were introduced, although probably

without intention. Leaving the public buildings, castles and urban mansions of the olden time, attention was next directed to street architecture. The regenerative activity of modern times had cleared away within the last twenty years very many of these relics of ancient social life, and though there were still some delightfully insalubrious closes and wynds and not a few charmingly picturesque slums in Dundee, the all-powerful Improvement Act of 1871 had cleared many of them away. Nevertheless, it was possible still to show streets and closes as they existed in Dundee in the middle of the sixteenth century and to indicate the forms of the street architecture in the principal thoroughfares of that time. Representative examples were then shown of the inner courts in some of the wynds and closes, the "posterior tenements" of the old charters. After speaking of the changes in the form of the outside staircase, the lecturer dealt with the development of architectural ideas in Dundee during the last fifty years, and views were projected on the screen of many of the modern public buildings. The quasi-Gothic style, as applied to church architecture about 1840, and the florid Gothic style, as illustrated by Sir G. Gilbert Scott's Albert Institute, were taken as examples of two varieties of these phases of architecture. Examples were also shown of the Grecian, Flemish, French Renaissance and Tudor styles, and also of what the lecturer designated that inexplicable abortion, the nineteenth-century atrocity. So enlarged were the ideas in Dundee that Dundonians could tolerate within the compass of one public square specimens of nearly all these widely divergent styles of architecture, each proprietor erecting his dwelling or public building with a supreme contempt for that of his next-door neighbour and making thereby a curious jumble of incongruities. Mr. Millar thereafter, by the aid of the limelight, threw on a screen a large number of sketches of ancient and modern buildings, giving interesting accounts of each, and pointing out the many peculiarities in the architecture of some of them.

THE DUTIES AND RESPONSIBILITIES OF ARCHITECTS.*

THE reading of this paper, and the discussion that will doubtless follow, will, it is to be hoped, bring out a little more clearly than at present exists the duties, liabilities and responsibilities of architects in the exercise of their profession. There have been so many decisions by the Courts affecting the position of architects, that by drawing attention to this subject and some of the principal cases decided, it will give, at any rate to the younger members of this body, some useful information, and be of assistance in our practice. It is proposed to divide the subject into three general heads, and to consider the duty and responsibility of the architect in connection with each as follows, viz.:—1. The design of the structure. 2. The supervision of its erection. 3. The granting of certificates. Other points than those expressly mentioned will be touched upon in the consideration of the matters arising under these heads, such as the authority of the architect to order variations, authority to order bills of quantities to be prepared, and other incidental matters; but the subdivisions adopted are sufficiently defined for the present purpose.

First, then, the responsibility of the architect in the preparation of the design. An architect is responsible for any errors in the preparation of the plans whereby the building owner suffers damage. In other words, an architect in designing a structure is bound to act in a skilful and careful manner, so that, so far as can be foreseen by the exercise of care and skill, the building, if erected, shall carry out the purpose for which it is intended in an efficient manner.

There is not, however, any implied warranty on the architect's part that his work is actually correct, nor can the architect be held liable for errors which might arise, providing he has exercised reasonable care and skill, and has honestly carried out his work to the best of his judgment and ability; but the meaning of this is evidently that if, in designing a building, an architect does that which any prudent and skilful person, exercising care and skill, would have done, and it fails, the architect is not liable for such failure. Of course it must always be a matter of evidence as to what constitutes negligence or ignorance, and unless the work has been carefully designed, and the specification thoughtfully prepared, errors will arise and unpleasant litigation ensue. Too much care cannot therefore be exercised in the preparation of the design, and in seeing that it fully carries out the requirements of the employer, and great pains should be taken to discuss fully all details of the plans and specifications, and to very carefully explain every contingency that can be foreseen in connection with them.

Before the contract drawings are prepared and tenders

* A paper read by Mr. W. J. Jennings, F.S.I., at a meeting of the Society of Architects held at St. James's Hall, Piccadilly, on Tuesday, January 10.

obtained, it should always be made a point to obtain, if possible, an acknowledgment that the sketch-plans—*i.e.* those plans which form the data from which the contract drawings are prepared—are approved by the employer, and these sketch-plans should not be destroyed. It might also be added, in passing, that this is a good opportunity for having a definite understanding, in writing if possible, not only of the remuneration to be paid to the architect, but upon such other matters as the ownership of plans, and travelling and incidental expenses, for although the usual 5 per cent. commission is recognised by custom as the proper remuneration, plus travelling and incidental expenses, this is by no means the invariable practice, and many naturally view with suspicion payment based on the cost of the structure. As to the ownership of drawings, in the absence of any agreement to the contrary, the building owner could claim them.

Another point which cannot be too strongly dwelt upon is the desirability of entering, in as minute and full a manner as possible, all verbal instructions received from the client relative to the proposed work, and to make such entries as soon as possible after the conversation.

Having thoroughly assured himself that the wishes of his client have been embodied in the designs, and that they are prepared in a skilful and reliable manner, the specification must next be drawn, taking care that the interest of the employer is safeguarded in every way, and that the contractor is made responsible for all errors of omission and commission whereby the building owner suffers damage, even if after the granting of the final certificate. Too much care and caution cannot be exercised in the preparation of the specifications and general conditions, as they are, of course, the basis of the agreement, and in the event of any dispute arising either between the building owner and builder, or between the building owner and architect, as to the method of carrying out the works, they are relied upon and interpreted very strictly by the Courts.

Before inviting tenders for the works, it is a good plan to have detail drawings to a sufficiently large scale to illustrate any ornamental portions of the design. It saves any question between the architect and builder as to the amount of work intended by the contract drawings, which, being generally prepared to a small scale, renders it impossible to say, with any degree of certainty, what is really intended, although it should be borne in mind that if details are given which show more work than can reasonably be presumed to be intended by the contract drawings, and the contractor execute these works without demur, he (the contractor) cannot afterwards sustain a claim for extras on the ground that the detail drawings constitute an order for the work.

Assuming, now, that the plans and specifications are prepared, tenders invited, and one accepted, and the contract signed both by the building owner and the builder, and that such contract contains the usual clauses as to the architect's certificate being a condition precedent to the builder's right of action against the building owner, and also provides for the decision of the architect in cases of dispute or difference of opinion, either during the progress of the work or in the settlement of the accounts, the work is commenced, and we arrive at the consideration of the second division of the subject, *viz.* "The duty and responsibility of the architect in the supervision of the work." Before, however, dealing with this head, it may be added that the condition as to the decision of the architect being final and binding in case of dispute in the making up of the final accounts is by no means always inserted in the contract. It is now more usual to have a clause appointing an arbitrator (other than the architect of the building owner) in the event of any dispute arising under the contract, and certainly from the builder's point of view this would seem the most satisfactory course to pursue. But so far as the superintendence of the work is concerned the position of the architect is not materially affected by this clause.

It should be distinctly understood that the position of the architect is materially altered directly a contract is entered into between the building owner and contractor, for the purpose of carrying out the architect's design.

Before any contract is entered into the architect's position is simply that of professional adviser to his client; but after the contract is signed his position is something more than this, for not only has he his duties to perform to the building owner, but he has to exercise his judgment and discretion in construing the specification as between the building owner and builder. Not only has he (the architect) to see that the building owner receives justice at the hands of the builder, but he must see that the builder is not hampered by an exacting and unscrupulous client. Above all things the architect must act in a thoroughly impartial and unbiassed manner, and let him always bear in mind that without express authority to the contrary his duty is to see that the contract is carried out without substantial deviation.

It is often found, however, in practice, that the building owner cannot realise the position in which the architect is placed as between the parties to the contract, and he will often

act—or try to through his architect—in the most exacting manner, and would construe clauses in the specification in such a manner as would render it quite impossible for the builder to carry out the work.

A difference of opinion often arises between the building owner and his architect as to what constitutes superintendence of the works. There are no definite rules laid down upon this point; and, indeed, it would be quite impossible to say how much superintendence is to be given to any work to bring it to a successful issue, so many matters having to be taken into account in each case. Oftentimes the building owner appears to look upon his architect very much as a clerk of works, and expects such a large amount of supervision to be given as would render it impossible for an architect to have more than one contract in hand at a time; but this view of the matter cannot of course be upheld. The actual amount of supervision must of necessity depend upon the architect employed. If he is an exceptionally busy man it is impossible that he can give much time to the superintendence, and a clerk of works is indispensable. As a matter of fact, no question of "amount of supervision" can be entertained; but it should be clearly observed that as the architect is responsible for the work generally, he should give such amount of time to it as will enable him to see whether or not the works are being carried out substantially as specified, and in particular he should make a point of seeing every part of the foundations before any concrete is put in, and all drains before allowing them to be covered in. Architects take upon themselves a great responsibility when they do not—as is too often the case—insist upon a clerk of works. Certainly it ought to be made quite plain to the building owner that in many matters of detail, in themselves most important, there is a great risk of having the building inferior to that specified unless there is constant supervision, such as only a clerk of works can give. If this were always put clearly before the employer, the Courts would attach more responsibility to the building owner and less to the architect, for defective work owing to the lack of minute supervision.

The employment of a clerk of works does not, however, relieve the architect of his responsibility, as the clerk of works is simply the agent, so to speak of the architect, who has the sole control, and is responsible for seeing that the works are carried out substantially as specified.

In the event of a building owner bringing an action against the architect, and alleging want of supervision, whereby he (the building owner) has suffered damage, it would not be sufficient to show that so many inspections had been made during the progress of the works, for it is clear that the actual number of visits an architect pays to the work is no guarantee—in many cases at least—that there has been proper supervision. Of course, if other things are equal, the more frequently works in progress are inspected by the architect, the greater will be the chance of their being well carried out; but there are many architects of great experience who would see more in one visit than others of less experience would in a dozen, and no one could plead with success that because he had made so many inspections during the progress of the works, therefore he had not been negligent; so then it may be said that it is not so much the "amount of supervision" that is the essential as the "quality." So in the case of *Rogers v. James* it came out in evidence that the architect had visited the works daily during the time the foundations were being put in, but this did not prevent his being held liable to the building owner for the damage caused by the omission of concrete foundations in places, and for other defects.

During the construction of the works the architect will often discover that something has been carried out or omitted contrary to the specification. In these days of keen competition on the part of the builders to obtain work, and owing to the very general desire of the building owner to obtain his work at the very lowest cost, irrespective of the character of the builder, the latter often resorts to the substitution of inferior materials and workmanship to make up for a very low price. Such questions then arise as, for example, the quality of the timber. Very possibly the architect has specified that none but balk timber is to be used, but the builder will try and substitute deals and battens, and so save the difference in price. It is quite possible that the architect may not have discovered this substitution until a great deal of the timber is built in, and the question arises as to what is the duty of the architect under these circumstances. It may be that the timber is the very best of its sort, and even it may be a matter of opinion which is the better of the two. The architect, taking everything into consideration, may be inclined to think that, as the taking of the timber out of the building and putting in that which is specified would be a very serious loss to the builder, and as there is not much difference between the two sorts after all, the case would be met by deducting from the contract price the amount of the difference between the two sorts. In that case one might assume that the employer had suffered no damage, but this is hardly the correct way to deal with such a case, neither is the mere difference in the price of the timber the

proper measure of the damage. In a case of this sort, and this view has been upheld in several cases, the duty of the architect is clearly to insist upon the materials as specified being used, no matter at what expense to the contractor. The question of timber is taken only as an instance, and one very commonly met with. There are many other points which might be taken, but the duty of the architect is the same throughout.

This brings us to another point which it is convenient to deal with under this head, and that is the authority of the architect to order deviations from the drawings and specifications.

Upon this point there is much difference of opinion, but, speaking generally, and in the absence of any express condition to the contrary, the architect's relation to the building owner in connection with the superintending of works would come under that class known as general agents, and he would have power to bind his clients to alterations which he may order the builder to carry out in the details of the work; but there must be no radical alterations in the plans, as the architect's duty is to carry out the plans and specifications which form the basis of the contract, and therefore he must be careful before ordering extensive alterations and variations. Of course, where an architect is employed simply to prepare plans he is on a very different footing, and scarcely comes under the head of an agent at all. In this case he has simply to supply something for which he receives a certain sum of money, and the matter ceases, but generally architects are not only employed to design a structure, but to superintend its erection, and then the architect may be considered in the light of a general agent for all purposes for which he is employed to the building owner. The case of *Kimberly v. Dick* clearly shows that this is the position of the architect.

The circumstances of this case were somewhat peculiar, inasmuch as there was a distinct understanding between the architect (White) and the building owner (Dick) that the total cost, including all incidental expenses and architect's commission, was not to exceed 15,000*l.* It was one of the conditions as between the building owner and the builder (Kimberly) that all questions between the parties under the contract should be settled by the award of the architect. The plaintiff was unaware at the time he signed the contract, or for some time after, that there was any undertaking given by the architect to the employer that the house should be erected for a sum of 15,000*l.*, and the contractor claimed to be entitled to be paid by the employer for all quantities executed by him beyond those included in his estimate and for extra work, and it was held that the architect was the agent of the employer, that his undertaking having been concealed from the builder the arbitration clause in the contract could not be enforced, and that the plaintiff was entitled to an account for what was due to him for any works executed by him, under the architect's direction, not included in the contract, and for any works so executed under the contract the price for which was not therein included, and for any variations made under the architect's direction, of work included in the contract.

In the course of his judgment Lord Romilly, Master of the Rolls, said :—

I proceed now to examine the contract itself, and shall then consider what works were then, and have been since executed by the plaintiff under the directions of White; this raises the question of the character in which Mr. White is to be considered in dealing with this case, and in doing so I am of opinion that I must treat Mr. White as the agent of Mr. Dick generally, for all purposes connected with this building, and that without any limitation as to price or anything else.

This case has been upheld repeatedly, but of course it does not prevent the building owner from recovering damages from the architect for exceeding his authority.

During the course of the building it often happens that circumstances which could not be foreseen cause some alteration from the drawings and specifications, such for instance as extra concrete in foundations, and as this is a matter that could not be foreseen, the architect would not be exceeding his authority in ordering it, although it might amount, as it too often does, to a very considerable sum of money.

Speaking generally, if it could be shown that what is done is absolutely necessary for the stability of the building and that without it the works would be defective, then the architect would be held not to have exceeded his authority; but this must not be taken to refer to works ordered by the architect to cover faults in the design which, by the exercise of skill and care, would have been avoided. In all cases, however, by simply advising the building owner what is proposed to be done, a great deal of responsibility would be taken from the architect's shoulders, and this course should invariably be taken in dealing with building committees and public bodies, and all alterations suggested by committees should be embodied in a resolution and entered in the minutes of the committee, and ordered in writing by the architect.

While upon the question of authority it does not seem out of place to say a few words as to the authority of the architect to order quantities to be prepared. It is a difficult question to

discuss owing to the want of any definite decision, but the general ruling would appear to be that where the building owner employs an architect to prepare plans and specifications and obtain tenders for the work to be done, this constitutes an order for the architect to retain a quantity surveyor and take out the quantities; but as there is so much doubt on the matter the only satisfactory method of proceeding is to let the building owner know that this must be done and be paid for by him.

Thirdly, the granting of certificates. Under a contract for building power is reserved to the architect to grant certificates during the progress of the building and for giving the final certificates, the latter class taking into account all variations made during the progress of the building and, after adjusting all additions and deductions, certifying for the balance. Certificates given during the progress of the works are usually provisional, and are subject to adjustment in the final certificate, but an architect having once given his final certificate it cannot be varied, and his duty is at an end under the contract.

There is considerable doubt on the question of the architect's responsibility in granting final certificates owing to the recent decision in the case of *Rogers v. James*. Previous to this decision many people had been of opinion that an architect when acting under a contract—wherein his decision was to be final and binding as between the building owner and builder in deciding any question as to workmanship or price—was in the position of a quasi-arbitrator, and in that position could not be held liable to either the building owner or builder, so long as he acted honestly and to the best of his judgment and ability—see the case of *Stevenson v. Watson* (which decision was founded on that of *Pappa v. Rose*). This was a case in which the plaintiff contracted with a company to build a hall, the plans, bills of quantities, &c., for which had been prepared by the defendant who was employed by the company, and named in the contract as their architect to carry out the works. The contract provided that the architect might order additions to or deductions from it, and that the amount of them should be ascertained by the architect in the same manner as the quantities had been measured, and at the same rate as they had been priced; that the contractor and the company would be bound to leave all questions or matters of dispute which might arise during the progress of the works or in the settlement of the account to the architect, whose decision should be final and binding on all parties, and that the contractor would be paid on the certificate of the architect. The claim then alleged that the contract was signed by the plaintiff in the belief and expectation, as the defendant well knew, that the defendant would use due care and skill in ascertaining the amounts to be paid by the company to the plaintiff; that the work was done, that additions and deductions were ordered and certificates given by the defendant, but that he did not use due care and skill in ascertaining the amounts, and neglected and refused to ascertain them in the same manner as the quantities had been measured and at the same rate, and knowingly or negligently certified for a much less sum than was the net balance payable to the plaintiff and refused to reconsider his final certificate, by reason whereof the plaintiff was unable to obtain payment from the company of the balance. On demurrer held that the functions of the architect in ascertaining the amount due to the plaintiff were not merely ministerial, but such as required the exercise of professional judgment, opinion and skill, and that he therefore occupied the position of an arbitrator, against whom no fraud or collusion being alleged, the action would not lie. The Lord Chief Justice was so emphatic of the principle laid down here that it is necessary to quote one or two extracts from his judgment. After reciting the case he (the Lord Chief Justice) said :—

This claim is for that which has over and over again been attempted without success; it is an action against a man for the negligent performance of a duty, in the doing of which the exercise of judgment or opinion is necessary. Such being the true view of the claim, the cases on that point apply and bind us. Speaking for myself, I entirely approve of them and think them sound and right.

That is, the architect is in the position of a quasi-arbitrator, and Mr. Justice Denman, in a judgment supporting that of the Lord Chief Justice, said :—

It seems to me that an architect is an arbitrator from the beginning to the end of the contract. He is throughout to have his eye on the work and to give certificates from time to time, all having reference to his final certificate, and unless he gave the duty up altogether from the first appointment, he is from the first a person exercising judgment on a matter on which the parties themselves cannot exercise judgment.

I think, therefore, that the parties have trusted to him, and that from the beginning he must exercise his functions fairly and honestly between them, and that if he violates that duty he is liable to an action. If he honestly performs them, then he honestly performs his bargain, or his duty if it be a duty, arising from the acceptance of the functions, and the parties must abide by it.

By this judgment the architect seemed placed in a very strong position indeed. Certainly this was an action brought,

not by the building owner against the architect, but by the builder against the architect, but it seems that if the builder was bound so rigidly to the decision of the architect—fraud and *mala-fides* not being suggested—how much more so was the building owner, who has the appointing of the architect, and whom the architect is naturally anxious to please? Certainly under this decision the architect was to a great extent made his own judge in the event of the building owner bringing an action against him, and yet if he is liable to an action by one party after having honestly exercised his judgment and ability in deciding matters in dispute, how is he to give an unbiassed decision? In the case of *Rogers v. James*, however, and this case should be considered by all architects, he, the architect, is under a very different position from that previously ruled, a decision which places him very much in the hands of an unscrupulous client, as a perusal of the case will show. The extract is taken from the professional notes of the Surveyors' Institution, vol. v. part 2 :—

In a building contract the architect's certificate is final as between the builder and building owner, but not as between the latter and the architect himself.

Action by an architect to recover 123%, the balance of his account for services rendered to the defendant in connection with the erection by a builder of a house at Bromley, Kent. The defendant counterclaimed for damages for negligence, owing to the plaintiff not properly supervising the building of the house, in consequence whereof the builder omitted to put certain concrete into the foundations and omitted to do certain other works. The plaintiff denied he was negligent, and further stated that in giving his final certificate to the builder he deducted 82% in respect of the omissions from the amount certified to be due to the builder, and contended that this certificate was binding upon the defendant under clause 16 of the contract between the defendant and the builder. Clause 16 provided that—

The decision of the architect with respect to the amount, state and condition of the works actually executed, and also in respect of any and every question that may arise concerning the construction of the present contract, or the plans and specifications, or the execution of the works hereby contracted for, or in anywise relating thereto, shall be final and without appeal.

The action was tried before Mr. Justice Mathew and a special jury, at Maidstone, where the jury found that the plaintiff had been guilty of negligence, and found a verdict for the plaintiff on the claim for 58%, and for the defendant on the counterclaim for 90%. The learned judge gave judgment accordingly. The plaintiff moved for judgment on the counterclaim or for a new trial. The Court dismissed the motion.

The Master of the Rolls said that the jury having found negligence in the plaintiff, the only material question arose upon the counterclaim. It was contended that the certificate which the architect gave under clause 16 of the contract was a final settlement of the amount of damages, and could not be questioned by the defendant. It was said that the certificate was final as between the building owner and builder: any question as between the building owner and the architect would not be decided by that certificate. As between the building owner and the builder the architect had, in the honest exercise of his judgment, awarded a sum which the building owner could not question. As against the architect, the building owner could question that. The jury had found that the architect was negligent, and that the architect had not awarded sufficient. The learned judge was satisfied with the verdict, and a new trial could not be granted. Whether the Court would have arrived at the verdict was not now the question.

Lord Justice Lopes concurred. The architect must not act negligently. Clause 16 of the contract gave the architect no jurisdiction to decide any question of negligence as between himself and the building owner, and the building owner could bring an action of negligence against the architect. The jury found that the 82% allowed by the architect was not sufficient, and they awarded the building owner a further sum from the architect. The judge was satisfied by the verdict, and that Court could not disturb it.

Lord Justice Kay concurred.

By this decision it will be seen that while the architect's certificate is final and binding, as between the parties to the contract, in the absence of fraud or collusion or any circumstances calculated to bias the opinion of the architect, and that while the building owner cannot be held liable for more than the award certified by the architect, yet after the architect has honestly done what he considers to be his duty to both parties, he is still liable to an action for negligence by the building owner. Under these circumstances it would seem that it would be more satisfactory to all parties if, in the event of any dispute between the building owner and builder, the matter was left in the hands of an independent person as arbitrator.

The certificate of the architect is binding between the employer and builder in the absence of any circumstances which would tend to bias the mind of the architect, but the architect having giving an undertaking that the building could be erected for a certain sum, this was held in *Kimberly v. Dick* to be a matter that would bias the architect in deciding between

the building owner and builder, and therefore his certificate was not upheld. Of course, too, undue interference on the part of the building owner might reasonably invalidate an architect's certificate.

Architects should be careful in giving certificates to see that they are in the form prescribed by the contract. A mere statement of accounts approved by the architects is not sufficient. Thus, in the case of *Morgan v. Birnie*, it was held that the fact of the architect having sent on the accounts to the employer, with a letter saying that they were correct, was no evidence of the work having been certified by the architect: this will show how essential it is that the spirit and letter of the contract in this, as in other matters appertaining to the building, should be carefully followed.

There have now been pointed out as fully as it is possible within the limits of a paper some of the pitfalls that an architect will meet with in the exercise of his profession, but in conclusion it may be said that if he shows reasonable skill and ability, and acts with tact and judgment, he need be under but little apprehension in dealing with building owners and builders, difficult though his position is sometimes made.

PRESERVATION OF ANCIENT MONUMENTS IN IRELAND.*

THE preservation, examination and illustration of all ancient monuments and memorials of the past, as connected with the antiquities of Ireland, are the objects for which our Society was formed in 1849; and number one of the general rules of the Royal Society of Antiquaries of Ireland, as set out in its constitution and approved of by Her Majesty the Queen through her Principal Secretary of State, continues to declare that these are still the first and only objects for which the Society exists. How far this purpose has been accomplished the forty-four bulky yearly volumes and the fourteen annuaries issued by the Society, with some thousands of illustrations, can abundantly testify.

The legislation on the subject of the protection of the ancient monuments of our country is of paramount interest to all our members, and with a view to their information on this and some points not easily obtainable save through the medium of numerous uninviting Blue Books, the Council of the Society have requested the writer to give in the pages of the Journal a short *résumé* of the scope of the recent and two former Acts, with a list of the structures brought within their operation. To do this is indeed in a measure obligatory on the part of the Council, as in the courteous terms of the letter of the secretary of the Board of Works charged with the administration of this Act, that communication is said to be made for the information of the members of the Society generally.

Mr. Ruskin appositely remarks :—"What we have ourselves built we are at liberty to throw down, but what other men gave their strength and wealth and life to accomplish their right over does not pass away with their death; still less is the right to the use of what they have left vested in us only. It belongs to all their successors." It was similar feelings of obligation to the past and duty to posterity that guided the unwearied labours of such men as Graves and Prim in our Society to preserve, so as to pass on to future generations, this heritage intact, and animated the minds of a band of workers, like Du Noyer, O'Donovan, Wilde, Brash, Windele, Hitchcock, Hayman, Caulfield, and many others now passed away, who placed on record accurate descriptions and illustrations of as many objects of interest in the pages of our Journal as came within their field of practical observation. The immense value of such methods of preserving ancient monuments is not fully understood. On this point Mr. Romilly Allen, F.S.A. (Scot.), says :—"It cannot be too clearly pointed out that the protection of ancient monuments, although in the highest degree desirable, is but a secondary consideration compared with the necessity of preserving some record of their existence in case they should be destroyed at any future time. Once an ancient building has been measured, planned, photographed, and accurately described, its loss will not be such a national calamity as if no particulars about it had been kept."

While the work of preserving in the sense thus indicated was going on vigorously and without intermission, a departure was made in the year 1857, and works of what some would call a more practical nature were entered upon at the Cistercian Abbey of Jerpoint, county Kilkenny, where, under the personal direction and supervision of Mr. James G. Robertson, architect, a sum of about 180% was spent on judicious and effective repair which preserved the principal architectural

* From "Notes on the 'Ancient Monuments Protection (Ireland) Act, 1892,' and the previous legislation connected therewith." By Robert Cochrane, F.S.A., F.R.I.B.A., M.R.I.A. Published in the "Journal of the Royal Society of Antiquaries of Ireland."

features of this interesting structure from threatened decay, and later on the excavation of the site of the extinct town of Jerpoint was undertaken. Of the other works successfully carried out by the Society, a passing reference may be made to the opening of the beautiful and unique choir window in the remains of the Franciscan Monastery at Kilkenny, where the services of Mr. Thomas Drew, architect, were given gratuitously. At Clonmacnoise the restoration of the twelfth-century arches of entrance doorway and chancel of Queen Dervorgilla's chapel was carried out under Rev. James Graves's personal supervision, and it remains a perfect specimen and illustration of the manner in which such work should be approached and executed.

Other work was done at the Clonmacnoise group of ruins, which cost upwards of 200*l.*, and the Round Tower of St. Finghin's Church, which was dangerous, was left secure. Not the least important work done by the Society here was the prosecution of a number of persons who had mutilated and injured the sculptured stones. It was the first prosecution of the kind attempted, and as it was widely known and talked of, must have had a most beneficial effect in deterring others from committing such wanton depredations. The cost of the proceedings was very heavy, and was defrayed by subscriptions collected by the Society for the purpose.

At Monasterboice the Round Tower was secured under the direction of Mr. J. Bell, architect, and a survey was made of the ruins at Glendalough for the Society by Sir William Wilde and Rev. James Graves, and in this case Mr. Drew's professional services were again at the disposal of the Society. Almost every ruin of interest in the country, where reported in danger, was examined, and where the Society could not undertake the work, local interest was aroused, and the desired object effected. The example thus set had far-reaching effects, and influenced a number of proprietors who had such monuments on their estates to take an active interest in their preservation.

While these operations were going on no opportunity was lost of directing public attention to the necessity of the preservation of the ancient monuments of the country by the Government, and the Society adopted a national petition to Parliament for an annual grant of money, to be laid out under the supervision of a committee of antiquaries, for the preservation of the ruins of ancient Irish buildings. The Poor-Law Commissioners (now Local Government Board) were, in November 1868, communicated with, and asked to introduce into all contracts for enclosing burial-grounds a clause against using any portions of the ruins of the ancient churches or any monument or sculptured stone found within the cemeteries; and to this request that body assented. It had come to the knowledge of the Society that in many cases contractors employed by Boards of Guardians had used the stones of the ancient churches for building the enclosing walls of burial-grounds, and the interference of the Poor Law Board in the manner suggested by the Society had the most satisfactory results. The Government of the day was approached, both in Parliament and by deputations to the responsible Ministers; memorial forms were adopted, printed and circulated, and petitions were forwarded from almost every town of importance in the country; and these efforts, combined with the exertions of the Royal Irish Academy under its president, Lord Talbot de Malahide, were instrumental in the introduction of a clause in the Irish Church Act of 1869 (32 and 33 Vict. c. 42), under the 25th section of which the Irish Church Commissioners were empowered to transfer to the secretary, Board of Works, "upon trust for preservation as a national monument, and not to be used as a place of public worship, any ruinous disused ecclesiastical structure which by reason of its architectural character or antiquity is deemed worthy of preservation." The same section empowered the Irish Church Commissioners to pay to the secretary of the Board of Works out of Church funds the sum that might be necessary for maintaining the structure. The groups of buildings so transferred are 137 in number. The sum of 50,000*l.* was handed over to the Board of Works and invested for their maintenance.

The expenditure on commencement of this year on works of restoration, salaries, &c., as shown by the Blue Books, amounted to a total of about 35,000*l.*; and the interest on the balance of stock is all that is now available to pay for the necessary work of preservation and other expenses, including the salary of a superintendent (Sir T. N. Deane), appointed by the Treasury. The expenditure on salary, travelling expenses, caretakers, &c., amounted to above 400*l.* per annum, and the sum available for expenditure on works of preservation is probably a little over 400*l.* per annum. An additional salary of 50*l.* has been granted to Sir T. N. Deane in respect of monuments placed in charge of the Board of Works under the Act 45 and 46 Vict., cap. 73, 1882, commonly called Sir John Lubbock's Act, the maintenance of which is provided for in an annual vote by Parliament. The amount granted for the latter works ranged from 150*l.* to

250*l.* annually, but the expenditure for a few years seems to have been nominal.

In a communication from the Inspector for England to Mr. Romilly Allen, the former suggested the formation of local committees for the purpose of finding what monuments it would be most desirable to deal with, and in "Y Cymmrodor," vol. xi, p. 10, Mr. Romilly Allen, referring to the defects in the lists, says:—"I have always maintained that a general archaeological survey of Great Britain by Government should have preceded, and not followed, the introduction of a Bill for the Protection of Ancient Monuments."

The provisions of the Act of 1869 did not take practical effect until the year 1875, when the Board of Works commenced operations at the Rock of Cashel, which was the first structure vested under the Act for the purpose of preservation and future maintenance. Here and at Glendalough, which was taken in hand the same year, the valuable reports and suggestions of Rev. James Graves and other archaeologists were placed at the disposal of the architect of the Board of Works, the late Mr. J. H. Owen, who thankfully received, and as far as lay in his power carried out, the recommendations made by the Society. A special officer was appointed by the Treasury, called Superintendent of National Monuments, to whom was entrusted the duty of advising on all details connected with the operations, and further archaeological advice from the Royal Irish Academy or this Society does not seem to have been required. It was found that a great number of pre-historic and other structures of the greatest interest could not properly be vested under the Act of 1869, which was confined to any ruinous or disused "church or ecclesiastical building or structure," the property of the Irish Church; and as at this time the want of an Ancient Monuments Act for England was much felt, the Irish antiquaries joined forces with their English friends, with a view to passing the Act Sir John Lubbock was engaged in promoting.

DUNDEE INSTITUTE OF ARCHITECTS.

THE opening conversazione in connection with the Dundee Institute of Architecture, Science and Art was held recently in the Victoria Art Galleries, Mr. W. Mackison, burgh engineer, president, in the chair.

The President, in addressing the assembly, said:—"Since the inauguration of the Victoria Art Galleries the successive sessions of the Dundee Institute of Architecture have been opened within these walls. The Councils of the Institute have esteemed this a great privilege, more particularly as the Fine Art Exhibitions have taken place at times suitable for this purpose. The opportunities thus afforded the members and their friends of examining under most favourable circumstances the fine works of art which have adorned the walls of these galleries have always proved sources of profitable enjoyment. The Council was anxious that this meeting should be held as formerly within these rooms, but on account of the immense labour and time required to procure and to appropriately place such a large number of varied exhibits for this the "Old Dundee" Exhibition, opened so auspiciously lately, it was impossible for us to have this conversazione at an earlier date. I am sure, however, you will all admit that the delay thus occasioned has been amply warranted by the deeply interesting and intensely fascinating exhibits by which we are surrounded. Although in this Exhibition we do not have so many works of living artists as in former years, still we are in the midst of an extensive and valuable collection of ancient articles, curios, relics, old paintings, and works of art illustrative of Old Dundee, and commemorative of many of its departed citizens and outstanding personages, who have so ably played their part in raising our city to its present position. We must acknowledge that within these galleries there is a collection not only unique in its conception, and rare, varied and characteristic in its exhibits, but also one which is fitted to entertain, interest and instruct. Nay, more, we have a splendid illustration of what can be done by the indomitable enterprise and perseverance of Dundonians of to-day. All praise is due to those gentlemen who have brought this magnificent Exhibition of "Old Dundee" to such a successful issue; and, on behalf of the Institute, I now desire to convey to them our best congratulations and thanks, and to express the sincere hope that the citizens will unite heartily in their efforts to make this Exhibition an entire success. In stepping out upon the ninth year of the existence of our Institute, I am glad to announce that it moves steadily forward. The success which has marked its past history has not only exceeded the expectations of its promoters, but presents encouragements for a still more prosperous future. The earnest and well-considered efforts of our past Presidents and Councils, the continued sympathetic co-operation of its members and friends, and the steady and valuable support of the local press have one and all combined to promote the welfare of the Institute. The recent affiliation of our Institute with the Royal Institute of British Architects has

already induced a number of the young men in this district who have entered the architectural profession to commence a systematic course of education tested by progressive examinations, in order to qualify themselves for being registered as probationers, students, and associates respectively of the Royal Institute of British Architects. Ten candidates have already passed the preliminary examination, and are registered as probationers. Whilst these are preparing themselves for the intermediate examination to be registered as students, I trust many others will follow their example and come forward for the next preliminary examination. These courses require very diligent and thorough study, and are designed, by careful preparation on the proper lines, to stimulate independent thought, and to lay a foundation of artistic and scientific knowledge on which to cultivate any natural aptitudes or gifts. The Institute of Architects bestows annually many valuable prizes and studentships, and as its transactions are now to be found in the Library of our Institute, those of our members who devote their attention especially to this department will have a better opportunity of studying the best principles and most recent practice in the art and science of architecture. In passing, I may just remind you that the Soane Medallist of the Royal Institute for 1849 was our esteemed first president, Mr. James Maclaren, and that when I was elected a Fellow of the Institute of Architects in 1865, the late Mr. David Bryce, of Edinburgh, was at that time the only other Fellow in Scotland. You will thus observe that the connection of Dundee with the Institute is not one of yesterday. Our recent alliance will, I anticipate, not only stimulate our young men in their work, but also open up valuable channels for their future advancement and success. This session eight prizes have been offered for competition, and, as the subjects are of a varied character, the Council will be disappointed if there is not a hearty response. An additional prize has this year been offered for the best landscape in oil, with the view of inducing a greater number of the ladies to take part in the competitions. Although the departments of photography and modelling in last year's competitions did not receive the attention expected, there was, however, an encouraging improvement in the architectural and antique departments, in the latter of which a young lady was for the first time a successful competitor. It will, no doubt, also be encouraging to some here to know that one of the young gentlemen who was successful in the competition for the best architectural measured drawing has been offered a liberal commission by an Edinburgh architect for a duplicate of his drawing of the Royal pew, Scone Church. I would strongly commend these competitions, knowing well that everyone who competes will, by the practice and experience thus obtained, be amply rewarded, although not honoured by securing the prize. The lectures have all along been of a most diversified, instructive, entertaining and practical kind, many of them being fully illustrated by diagrams and limelight views. The excursions to places of interest still continue to form a fruitful source of attraction, instruction, social intercourse and recreative study. Last session we were favoured by being admitted into Scone Palace and grounds, a privilege which, but for the nature and object of our Institute, would not have been secured. We were likewise enabled to visit museums, churches and places of interest in the neighbourhood of Perth, and in the districts of Auchterhouse, Newtyle and Meigle, on all of which occasions the excursionists received the most cordial and considerate reception. You may confidently rely on every effort being put forth by the Council to make the forthcoming excursions as interesting, enjoyable and profitable as those in the past; and I have no doubt that our local papers will continue, as heretofore, to favour us with full, popular and realistic accounts of our trips. We have cause for congratulation that so many ladies are now enrolled as associates, and I trust their number will increase, as they have all along taken an interest in the work of the Institute; and we need not be surprised at this, when we remember that ladies are now everywhere found engaged in the pursuit of higher education. In this connection it may be interesting to note that the architect of the "Women's Buildings" in the great Chicago Exhibition is a lady. The local Association for the Promotion of Technical and Commercial Education, on whose Council the Institute is represented, has done and continues to do excellent work in guiding and encouraging systematic courses of study. The Dundee University College is, through its able and energetic professors, making its influence felt in our midst, and, along with the other educational institutions of our city, gradually raising the standard of education and creating a desire for more advanced and thorough knowledge. The present facilities for acquiring knowledge should therefore be taken full advantage of, as success in any profession or business is now becoming less and less a matter of chance, and more and more a matter of skill. In consideration of the attention presently being given to the question of slum dwellings, it may not be inopportune for me to state that during the twenty years since the passing of the Dundee Improvement Act I have been engaged in clearing out numerous areas of Old Dundee, with their narrow streets and closes, thickly studded, dilapidated,

high, dingy, insalubrious, overcrowded and insanitary buildings, and in laying out and forming new and spacious streets and building lots, upon which improved modern buildings have been and are still being erected. This work has been followed by a marked improvement in the appearance and health of the town and by a large reduction in the death-rate. In connection with the work of demolition, the greatest credit is due to Mr. A. C. Lamb for the great care and trouble he has taken to preserve, by drawings and photographs, the quaint features of the old town. Notwithstanding all that has been done by way of improvement, there is still room for similar work being carried out in various parts of the city. The improvement of the slums is a difficult and complex process, and requires very careful consideration. There are deeper reforms that must go along with the shutting up or remodelling of the slum dwellings and the providing of good and suitable houses for the working classes, and these must take effect, not only on the habits of the people residing in such localities, but also on their moral and spiritual life. It is not an unusual thing to find single-roomed houses side by side, having common external arrangements, but yet internally quite dissimilar as regards the tidy, smart, and comfortable appearance of the one as compared with the filthy, slovenly, and miserable condition of the other. Now, why is this so? Simply because of the difference between the habits and characters of the respective occupants. In like manner new houses would soon become slum dwellings if nothing were done to improve the morals and habits of the people. The Dundee Police Commissioners have for some time past been prosecuting the work of shutting up or causing to be remodelled houses unfit for human habitation, and they have already effected a considerable improvement in various parts of the city. During nearly twenty-five years' experience of this annually changing body I have never found it lacking in zeal for the public good, nor wanting in determination to keep abreast of the times. As this is an age of rapid progress and continual change, architectural, scientific, and artistic works are consequently affected thereby in many ways. New materials are coming into use; the applications of existing materials are being varied and multiplied; new forces and agents are being developed; and the tastes and methods of the people are rapidly changing. All these combine to tax the knowledge and ingenuity of the architect, the ability and skill of the tradesman, and the taste and originality of the artist. Surely, then, this is a strong reason why we should put forth our most strenuous efforts to advance the aims and objects of our Institute.

Mr. Blackadder proposed a vote of thanks to Mr. Mackison, which was heartily accorded. A musical programme was then gone through. During an hour's interval the company enjoyed a "walk round" the "Old Dundee" Exhibition, and in one of the small rooms tea was provided. Mr. Mackison, who proposed a vote of thanks to the performers, remarked that he had received a letter of apology for absence from Mr. D. J. Macdonald, president of the Mechanical Society, in which he said that the Institute of Architecture, Science and Art had so many things in common with his Society that he thought the two should be more firmly united. He (Mr. Mackison) had it in view to speak on that subject in the course of his address. He held that there were many associations in the city that might affiliate with advantage at the same time that they met in sections and carried on their particular work.

RAILWAYS IN IRELAND.

THE annual general meeting of the Institution of Civil Engineers of Ireland was held in the new hall, 35 Dawson Street, on the 4th inst. The president, Mr. John C. Smith, delivered his inaugural address, in the course of which he congratulated the society on the success of their efforts in procuring their new hall for their meetings, and thus being no longer dependent upon their friends in Trinity College. The Institution seemed now firmly established, but in order fully to discharge its functions the Institute should be fully representative of the profession in Ireland. There were still some practising engineers in the country who were not members of any institution. Others were only members of the Institution in London, but how could they expect that latter body to give particular care to Irish matters when only 115 of their 5,400 members belonged to Ireland? The future of their Institution must mainly depend on the future of Ireland herself. If Ireland prospered their Institution would prosper; therefore he was about to speak on a subject intimately connected with this mutual progress. The President then referred to the railway rates, in reference to which he said it had greatly encouraged him in the study of the matter to find that a reduction of railway rates would be thoroughly in accordance with ideas expressed more than half a century since by Thomas Drummond, whose services Ireland had not yet forgotten. In the report on Irish railways of 1838 Drummond gave his conception of the policy which should be pursued by Great Britain towards the people of Ireland in these

words:—"To afford the means of present employment to such a people, and at the same time lay the foundation of their future prosperity and improvement, is surely an object worthy of a wise and great nation, and will not be opposed from any narrow and short-sighted views of economy. The interests of these countries are so inseparably interwoven that nothing which concerns one portion of the United Kingdom can be alien from the rest." Drummond foresaw how necessary it was for the prosperity of any country to possess a system of railways adapted to its requirements, and accordingly he set himself with all his might to procure such a system of railways for Ireland. Parliament adopted a resolution that commissioners, subject to the approval of the Treasury, should fix the rates of carriage on the railways. After Drummond was gone his ideas were safely shut up in the pages of a Blue Book, and so it came to pass that the railways in Ireland were committed to the direction of individuals almost unconditionally and without control. To carry out his idea Drummond required assistance from the State, and asked for it on the ground that the State would receive enormous profit on the greatest contemplated outlay, and he cited and estimated for the increase to the public revenue which would arise in the "article of excise." Between the time of the commencement of the additional taxation in Ireland and the time of the latest returns the wealth of Great Britain assessed to income tax had increased to over 100 per cent., and the taxation only by some 60 per cent. In Ireland the taxation had increased 60 per cent., but the wealth assessed by income tax had only increased by 25 per cent. It was clear that had Drummond's proposal been acted upon, had Ireland enjoyed during all those years the full and entire benefit which their railway system was capable of affording, such an impetus would have been given to the development of her material resources that her wealth would have increased by far more than 25 per cent., and might even have reached the percentage achieved by Great Britain. Had this been accomplished the unbalanced taxation of Ireland would have vanished. On the basis of figures supplied by the Treasury Parliament might so have regulated the national finances as to leave a substantial surplus of Irish revenue, and might have applied that surplus in the reduction of railway rates in Ireland, and so conferred a solid benefit upon practically every portion of this country and every member of its population. The Royal Commission of 1888 in its report mentioned the desirability on public grounds of reducing railway rates in Ireland, but condemned the plan of State purchase, and proposed in lieu a State guarantee to the companies. The question of the reduction of rates had not yet been brought before Parliament, but when the time came for that they might be confident that the people of Great Britain would justify Mr. Drummond's noble words, and would act in a manner "worthy of a wise and a great nation."

GOBELINS TAPESTRY.

A REPORT of the United States Consul-General in Paris on French tapestries gives some interesting information in regard to the famous Gobelins factory. It was founded in 1607 by Henri IV. in the scarlet dye works originally established in the fifteenth century by Jehan Gobelins. In 1662 it was bought by Louis XIV., on the advice of Colbert, and formed into the "Manufacture des Meubles de la Couronne," with 800 workmen directed by the most celebrated artists. After the death of Louis XIV. the factory reverted to its original work of making tapestry only. The national factory of Gobelins is now divided into three sections, dye shops, tapestry shops and carpet workshops. The first not only produce every colour, but twenty or thirty shades of each. The execution of the tapestry is so slow that an artist cannot produce more than a fourth of a square yard in a year. In 1826 the manufacture of carpets was added. These are remarkable for their softness and the evenness of their tissue. Some of them take five to ten years to produce, and cost from 60,000 frs. to 150,000 frs. Several tapestries of special importance exhibited at the Gobelins are mentioned by the Consul-General. A portrait of Louis XIV. by Rigaud is considered the *chef-d'œuvre*. A special account of the method of making the tapestry, by Mr. Debray, an expert, is also given in the report. This gentleman says that the value of Gobelins is on the average 3,000 frs. to 4,000 frs. per square metre, while that of the Beauvais tapestry is as much as 7,000 frs. The characteristics of Gobelins are large historical scenes and reproductions from celebrated paintings. Sales to private persons are only permitted by the special authority of the Minister of Fine Arts. To the Gobelins factory is joined the carpet factory of La Savonnerie (the building in which this work was first commenced was originally a soap factory), in which velvet carpets, reproducing historical and mythological subjects, are manufactured in the same way as velvets. The artists at Gobelins receive very high salaries. Hand-loom

only are employed, and tapestries of the ordinary dimensions require on the average three years. The manufacture of silk tapestries at Nîmes has been declining since 1750, and there, as at Aubusson, it is in private hands. At Beauvais as well as Gobelins the manufacture is controlled by the State. Cotton warps, called *boyaux*, are employed; the weft is of twofold wool, and is a species of Australian mohair wool, denominated *laine brodé*, its characteristic being that it is open and firm. The wefts are dyed by expert chemists and dyers, by the old method of wood dyes, such as indigo, cochineal and curcuma. Part wool and part silk tapestries are also manufactured, and a limited number all silk.

GENERAL.

The New English Art Club has lost the following members by resignation:—Messrs. J. J. Shannon, H. S. Tuke, Jacomb Hood, Theodore Wores and Alexander Mann.

At the Birmingham Art Gallery the large loan gallery is now being rearranged with the permanent pictures and a small but fine loan collection, consisting of works by Alma-Tadema, R.A., J. C. Hook, R.A., J. F. Lewis, R.A., Marcus Stone, R.A., Peter Graham, R.A., Vicat Cole, R.A., J. B. Burgess, R.A., James Holland and F. Goodall, R.A., &c.

The Exhibition of Works by living English animal-painters, which Mr. Whitworth Wallis got together in the Birmingham Corporation Galleries, closed on Sunday last.

The Associates of the Royal Society of Painter-Etchers elected on Friday last are Miss Susan Crawford, Miss Jessie Harrison, Miss A. Williams and Hubert Schröder. Mr. W. Holmes May has been appointed hon. treasurer.

A Collection of Drawings and Photographs illustrating "Architecture and the Allied Arts" will be comprised in the ensuing exhibition of the Glasgow Institute of the Fine Arts. A room has been set apart by the Council of the Institute for this purpose, and a committee of architects formed to make arrangements for the exhibition. Drawings intended for the Architectural Section will be received up to the 25th inst.

Professor Baldwin Brown read a paper on Wednesday to the members of the Edinburgh Architectural Association, entitled "Bronze Doors, including those of Southern Italy."

Mr. J. Macvicar Anderson has been selected by the St. Pancras Vestry to act as assessor in the competition for the proposed municipal buildings.

The Clothworkers' Company have given 3,000*l.* towards the building fund of the Northern Polytechnic Institute, by which the company's contribution is brought up to 5,000*l.*

The Convalescent Home at Cookridge, Leeds, is to be enlarged, as a memorial of the late Canon Jackson, and the subscriptions towards the cost now amount to about 3,000*l.*

The Salt-water Baths at George's Pierhead, Liverpool, are to be reconstructed and enlarged.

The Bradford Corporation have decided to proceed with the Nidd waterworks scheme. The probable expenditure will be 550,000*l.*

The Communal Administration of Vienna offer two prizes of 10,000 florins each, three prizes of 5,000 florins, and three of 3,000 florins, for the best schemes for transforming a part of the city. The time allowed for preparation is until November 30.

Professor Mackay, of the Liverpool University College, will read a paper entitled "The Teaching of Architecture in the New University" to the members of the Liverpool Architectural Society, at the meeting to be held on Monday, the 16th instant.

Mr. Wyatt Papworth has been appointed conservator of the Soane Museum in Lincoln's-Inn-Fields.

The Edinburgh Architectural Association has removed its quarters from 42 George Street to the Royal Institution, Princes Street.

The Southport Town Council have resolved to borrow 22,000*l.* for further improvements on the foreshore. The scheme includes a marine drive nearly a mile long, the union of two marine lakes, so as to give 50 acres of boating and bathing surface, and the enclosure of 80 acres of sand for recreation purposes.

The Stafford Town Council have under consideration the provision for the borough of a costly scheme of deep drainage, which is to supersede the old "pan" system at present in use. The system of sewers will be designed to meet the requirements of a population of not less than 40,000, and the cost is estimated at from 40,000*l.* to 45,000*l.* While the work of laying the sewers is being proceeded with, it is proposed that investigation should be made as to the various systems of chemical treatment.

The Local Government Board will to hold an inquiry relative to the application of the Halifax Corporation for sanction to borrow 100,000*l.* for gasworks purposes and 14,000*l.* for works of sewage disposal.

The Architect.

THE WEEK.

BUILDERS and contractors who seek after municipal offices will be wise if they weigh the words they employ in the course of electioneering campaigns, for promises given under excitement may become binding on them. A contractor for painting in Plaistow discovered on Monday that, through a few words spoken to a workman when he sought a seat among the West Ham Town Council, he will be compelled to pay an extra halfpenny and in some cases a penny an hour to his employes. In Plaistow and Stratford he was in the habit of paying $7\frac{1}{2}d.$ an hour, and in East London $8d.$ He sought corporate honours in October, and a deputation of workmen asked him whether he would pay an increase of wages under the award that was about to be acted on, and by which mechanics and workmen were to receive an extra halfpenny per hour. As became a candidate, he agreed. After the election one of the deputation found his wages were calculated at the rate of $8d.$ an hour, and he gave notice that he looked on the amount as no more than part payment. The contractor was obdurate, and a summons was taken out to recover $1s. 0\frac{1}{2}d.$ In his defence he said that he considered he was acting up to the letter of the award by increasing the rate of wages from $7\frac{1}{2}d.$ to $8d.$ In a district that is partly town and partly country probably metropolitan prices are not universal, and as the contractor had paid two rates, we suppose he considered that he complied with the requirements by raising the lower scale and having a uniform rate. But the magistrate was of opinion that the current rate of wages in the district at the time the promise was made was $8d.$ an hour, and therefore the rate which should be now paid was $8\frac{1}{2}d.$

THE sub-committee charged with the formation of a county museum for Buckinghamshire have issued a statement about the scheme. A site was selected in Aylesbury. It was formerly occupied by a brewery, and stands detached. The price was $550l.$ A building erected on the spot could be seen from the market-place. Mr. ROBERT RAIKES prepared plans, and he estimated the cost of the three sections at $2,000l.$, $1,400l.$ and $1,800l.$ respectively. It would also be necessary to provide for furniture, heating, salary of curator, wages of caretaker, &c. The arrangements were approved by the provisional committee. Afterwards the sub-committee discovered that a far more eligible site than the one proposed was to be sold at a very moderate price. This is the historic property known as the Prebendal. It consists of a large, substantially-built house, and about four acres of pleasure-grounds, with fine old timber, which would be a most important addition to the museum, opening up all kinds of possibilities, and in any case they could not fail to be an immense boon to all residents and visitors. The price asked for this property is $5,000l.$ This is upwards of $900l.$ less than would be required to complete the other plan, and in the end means four acres in the best possible situation, instead of a circumscribed area, in a less perfect situation, of about 90 feet by 30. A portion of this outlay could be undoubtedly recouped by selling or letting certain outlying plots for building and by letting some of the outbuildings. The offer extends only for six months, so, to prevent the opportunity being lost, it is imperative that whatever is done in the matter be done at once. As the proposed museum is not to be an imitation of the apothecary's shop in Mantua, to be fitted with stuffed alligators and ill-shaped fishes, but is to illustrate the history, archæology, botany, manufactures, &c., of the county, the project deserves generous support.

THE "timbering" of mines has answered so well when properly carried out, there is some novelty in a proposition which was brought before the Manchester Geological Society at the last meeting in Wigan, and which advocated the substitution of steel or iron girders for supporting the roofs of workings. The author was Mr. I. JOHNSON, who has had a long experience. He found that, although the cost of iron and steel in the first place was about three times, its life was at least six times that of timber, and there was pro-

portionately less risks of falls of roof, whilst when the road was done with the materials could be used again, or if they had to be sold they would at least fetch scrap price, whereas timber when broken was worthless. Considering the price of labour, and the danger of taking out old timber and fixing new, which was very costly, apart from risk, he was convinced that the use of steel and iron for the securing of main roads was decidedly preferable to timber. In the discussion which followed, the general opinion was expressed that steel and iron girders and props were excellent when there was no moving weight in the roof, but where there was a moving weight the supporting of the roof could be done much better with timber. The conclusion arrived at was partly inspired by the conservatism which prevents the introduction of many improvements underground. When it is remembered that iron and steel are now obtainable at most moderate prices, girders should be employed more often than they are at present.

WHEN the officers of the National Gallery in Edinburgh failed to appreciate Mr. ORROCK's gift of water-colour drawings he advised him to remove them and send them to Glasgow. That course has been followed. The fifteen drawings have been accepted with gratitude, and although Mr. ORROCK may not have the satisfaction to feel that his drawings are of use in his native city, they will at least afford gratification and instruction to others of his countrymen. There are two drawings by GEORGE BARRET; two by JOHN VARLEY, four by DAVID COX, four by PETER DE WINT, one by WILLIAM HUNT, one by GEORGE CATERMOLE, and one by R. P. BONINGTON. Mr. ORROCK is in hopes that he will be able to add an example by TURNER.

WILLIAM HUNTER, like his brother JOHN, was one of the lawgivers on medicine in the last century, but his enthusiasm did not lead him into unprofitable pursuits. He was wealthy, and he was enabled to enrich the University of Glasgow by a bequest of medals and coins, as well as manuscripts, rare books, shells and anatomical preparations. A building was erected to contain them, at a cost of $12,000l.$ WILLIAM HUNTER was particularly shrewd in all his dealings, and whatever he purchased was likely to be precious. It cannot be said that his gifts were appreciated. University students are not disposed to go beyond their curriculum, and, except out of curiosity, the HUNTER collections have not been utilised by the class for whom they were intended. The authorities of the University of Glasgow have observed the indifference, and recently they obtained power to sell the Hunterian collection of coins or any part thereof, and to apply the proceeds to the maintenance or extension of the Hunterian Museum and Library, or of other libraries and museums belonging to the said University. The scheme does not meet with the approval of the citizens of Glasgow, and the Town Council have decided to protest against the dispersion of the collection. It is also proposed to offer adequate accommodation in the new Art Galleries for the coins, where they would be accessible for inspection and study. We suppose there will be no difficulty in acceding to the desires of the Corporation. The study of old coins may not appear to be of much advantage to the citizens, but it is an innocent recreation in the intervals of utilitarian pursuits. As long as archæology is tolerated, coins must be considered as forming a part of it. Hereafter there may be more interest taken in the study, and it would be well for Glasgow to provide for that time.

WE have stated that a novel exhibition was to be held next year in Belgium. Part of it was to be seen in Brussels and part in Antwerp. The people of Antwerp are not over friendly with their countrymen in the little capital, and it has been found that the success of an exhibition must be imperilled which depended on the co-operation of the two cities. Moreover, in a contest between them Brussels always has to succumb. It is only nominally that its claim to precedence is admitted. The exhibition of 1894 will, therefore, be held in Antwerp. A guarantee fund towards expenses, amounting to $1,500,000$ frs., has been subscribed. There may be some difficulty in finding a suitable site, for to set up buildings at the outskirts of the city would be to court defeat.

ARCHÆOLOGY IN IRELAND.

IN all countries the study of archæology should be encouraged. Whatever theory of life may be adopted—the old one of degeneracy from primitive perfection, or the later one of progress from a lowly original—the value of relics of the past is alike incontestable. We may be doubtful about the truth of an ancient document, for it must be feared that annalists were prone to allow their imagination an abundant license. But the qualities of an ancient building, or the skill shown in a carving or a piece of metalwork, a coin, a painting or an illumination, cannot be gainsaid. We have obtained an acquaintance with the ancient life of Egypt through paintings, buildings and sculpture. If the histories and even the literature of Greece were razed out, it would still be possible to realise many of the characteristics of the people from the architectural remains and the sculpture.

In Ireland archæology deserves attention not only for the same reasons which prevail in other countries, but for political reasons also. The people are fascinated by the past. Through a strange sort of instinct it comes quite natural to an Irishman to believe in the ancient greatness of the island. All he reads about modern state in kings' palaces seems to him to be only commonplace performance if compared with the great ceremonies which took place in the palaces of the old kings. There were a great many kings in ancient Ireland, and it is concluded that they were surrounded by magnificence which surpassed all precedents. But what is more extraordinary, it is supposed those kings were not selfish. In some mysterious way all their subjects were enabled to share in their greatness and wealth. It might be thought from what is said that the ancient Irish principalities were a sort of partnerships on an enlarged scale, in which wealth was produced by means that are now unknown, and was most equitably divided among all classes. How so strange a delusion originated it is easy to understand. Old families in Ireland were in the habit of retaining bards, story-tellers and scribes, whose business it was to celebrate the greatness of their lords. Accordingly they seem to have entered into a sort of competition in the production of amazing legends. Efforts of the imagination, which in other countries were accepted at their true worth, but which were as unrelated to reality as "The Arabian Nights," in Ireland were associated with individuals, and come down to us as if they were records of events which had occurred. Another cause was the marvellous wealth of words which those retainers in families possessed, and which they loved to display, and therefore made opportunities for displaying. One example will illustrate the peculiarities of the word-painting of those gentlemen. In most countries it denoted a very early stage in civilisation when horses were employed in battle. The primitive charioteers formed a sort of military train, but the chariots did not excite any more amazement than other utilities. HOMER does not go into detail about the chariot to which HECTOR was attached, nor those which were used in the races which were part of the funeral of PATROCLUS. The poet's thoughts were concentrated on heroes. The ancient Britons also were able to employ chariots, but no fuss was made about their appearance by the bards. Now let us see how an Irish war-chariot was described:—

Then did the valiant champion spring into his armed battle chariot, with its thin swords, with its hooks and hard spikes, with its champion-bending spears, with its open machinery, with its galling sharp nails, which were disposed on the axles, and straps, and shafts and ropes of that chariot. Thus was that chariot: with its thin [close] dry entrance to its body, high-mounted, straight-shouldered, champion-like, in which would fit the arms of seven chiefs; with the fleetness of the swallow or of the wind, or of a fox over the course of a plain. That chariot was yoked upon two fleet, bounding, furious steeds; with small heads, small tufts, small legs, sagacious, broad-hoofed, red-breasted, switch-tailed, streaked, easy yoked, easy of motion under the splendid timbers of the car. One of these was swift, fleet-bounding, of great action, of flowing mane, vigilant, entire; the other steed, curly-maned, slender-legged, long-legged, narrow-hipped, &c.

The chariot on which so much magniloquence was wasted was probably as rudimentary in construction as the low-backed car which LOVER sang. A similar rule was followed in other descriptions. Everything which was in any way associated with a chief or a master was aggrandised by scribes. In consequence it is impossible to rely on any

description by a native of any animated or inanimate thing which existed in ancient Ireland.

The remains of antiquity which are to be seen in Ireland, or which are occasionally discovered, vary so much in value as to compel us to conclude that skilful artists and craftsmen were never very numerous in the island. Some examples of illumination and of metalwork are beautiful. But the architecture that is not of English origin is hardly equal to that of the Greeks. The carving on the buildings was produced without any regard to decorative principles.

The archæological importance of the buildings and their sculpture, or any other class of work, is not diminished by the deficiency of ability to express the beautiful. Although they may not rank high as works of art, they are still interesting as evidence of the efforts of a people to overcome difficulties. If we accept the records about the learning of Irish scholars, and the efforts they made to civilise the continent of Europe, a new interest is attached to Celtic works in stone, which compensates for their defects. For they demonstrate to us how book-learning can co-exist with the most humble ability, as artists. But with a people who are unable to judge of things as they are, it is not enough to leave defective ornament to speak for itself. Under the influence of the mysterious glamour by which perfection is sought in the past, the Irish people continue to conclude that barbaric forms and rude construction are unsurpassed by any modern productions of man's hand.

At one time there used to be a class of instruction which was known as philosophy. It has fallen into disrepute. Nobody cares now to talk about the philosophy of history, and a successor to MARTIN CHUZZLEWIT would no longer hear in an American boarding-house about lectures on the philosophy of vegetables, philosophy of crime, philosophy of the soul and so on. But there is a need for somebody to enforce a philosophy of archæology in Ireland, to explain the shortcomings of the majority of ancient examples of all classes, and in a word to endeavour to make the people judge by their reason instead of by their imagination. In suggestiveness Irish work stands almost as low as what comes to us from the South Sea Islands. It is not only imperfect; we feel that the men who produced it might have done better, but were too indifferent or too much afraid of trouble. The late Professor WESTWOOD, who, like some of his pet insects, was endowed with a microscopic eye, considered the manuscript known as the "Book of Kells," which is in Trinity College, Dublin, to be the most beautiful in the world. It is an example of painstaking labour, but it has been entirely fruitless. The contemporaries of the artist were not inspired by it to produce more elaborate illumination, and certainly at the present day no ornamentist would dream of going to it for a hint. We admire the patience which is visible in developing the principal letters, but there is not one element of the decoration which suggests that the artist used any natural form as a model. The figures have only the most remote resemblance to life, and are dissected according to the whim of the artist. In the last number of the Journal of the Society of Anti-quaries in Ireland there is an instance of the length to which enthusiasm will carry observers. The remains of an ancient doorway are found in the wall of the nave of Killaloe. It is described as magnificent, as "the glory of Clare, for seldom did man of Old Erin work out in stone a design of more beauty." Mr. WESTROPP, an Irish archæologist, gives the following description of it in the course of his article on the "Ancient Palaces and Cathedral of Killaloe":—

It consists of four orders. The innermost has a rich pattern of chevrons and lozenges, the enclosed spaces carved in beautiful designs of converging spirals and leaf work. The right-hand pillar alone remains. The capital of this (as in all the other orders) is fluted with asparagus-like bars in the hollows, the upper part square. The shaft is square, with bold flutings terminating above in lions' heads and below in lions' paws and human feet and some graceful leaves. The bottom block of the left-hand pillar has a small indented stand for the base. The bases in every case have spirals and rude foliage on the cushion-moulding, which rests on square blocks. The next order has a hollowed face, on which sprawl uncouth animals, their tails twisted into the hair of three human heads. The pillars are square, decorated with irregular chevrons, enclosing uncouth struggling animals and graceful foliage. The right-hand pier is entwined in knots of serpents; the capitals have an ear-like ornament, while the left-hand capital has animals. The third order has bold moulded

chevrons ending in a serpent's head; the interspaces are filled with "honeysuckle" ornament, as fine as if designed for embroidery. The capital of the right-hand pillar has a procession of griffins, each holding the tail of the one before it; while the left one has a knot of snakes. The pillars are detached round shafts cut in low-relief in lozenges filled with foliage and flowers. The fourth order has an architrave deeply cut into alternate chevrons and recesses richly moulded and beaded, ending in serpents' heads; the capital of the left pillar has an animal; the right, a beautiful honeysuckle or trumpet device. The shafts are square, with a rich vesica pattern cut into the angles, in curves of alternate beading and fillets.

Now if this work had been found in any other land, Mr. WESTROPP would be likely to say that not one inch of the ornamentation of the doorway was correct. It will be seen from his description that so much variety is fatal to unity in a small work like a doorway. There is so little continuity between the ornament and so much mechanical repetition of the elements, that parts might be removed or extended without any loss or effect. Why should long lines of fluting terminate in lions' heads at one end and lions' paws and human feet at the other? If animals are shown with their tails twisted into human masks, why should the heads lie against the upper line in one part and the lower in another place? The truth is, "the glory of Clare" appears to have been adorned by some man who was incapable to make a design. He got hold of a few scraps from some illuminated manuscript, and with this stock-in-trade he set to work in Killaloe. He expended a very long time in fitting and cutting the repetition of his patterns. We can imagine that the wild warriors who were congregated at Killaloe were surprised at the result. But the time has arrived when the defects of the works should be honestly declared, for as long as such examples of "art" are supposed to be the glories of Ireland, we must expect to see the modern students of art in that country wandering in paths that will not lead to perfection. The true philosophy of Irish archæology would have to show the inferiority of native work when compared with the contemporary work of other people. But the man who professed it would, we fear, have to be encased in triple steel, for imaginative peasants do not like to have their illusions unveiled.

If considered impartially, there is much which is entertaining about Irish archæology. A severe moralist like Mr. RUSKIN must of course object to the angel which an Irish missal-painter represented with red dots in the palms of each hand and circles for eyes, but without any trace of a mouth; but then think of the humour of the idea, the utter indifference to ordinary notions of what should be done, the independence of nature! Why should Irish illuminators or carvers be compelled to obey laws of art which were devised by foreigners? A still more remarkable instance of the peculiar independence is referred to in the *Journal*. There is a family of great respectability in Waterford, known as the BARRONS. It appears they claim descent from the BARRONS of Burnchurch, in Kilkenny. One representative of the family was actually offered a pedigree by the late Sir WILLIAM BETHAM, the Ulster King-of-Arms, who had charge of Irish genealogies. If some half century ago family trees were made out so easily, what must it have been at a still earlier time? Where but in Ireland could be found an University which was created for mere boys of twelve to fourteen? It was necessary to enact statutes against "apple-stealing, drinking, card-playing, frequenting town, fighting, swearing, absence from grace, and many other offences. For breaches of these rules the boys were birched, put standing at the pulpit during meals, put in the stocks, made to make confession for faults on their knees, and for very grave offences expelled." That was the state of the nursery of learning in Dublin under the Good Queen BESS. Subsequently, discipline was at times either too lax or too strict, and riots were of frequent occurrence. Provost BROWN died from a blow of a brick, and a Junior Fellow named FORD was shot in an attack made on his rooms. The early Fellows mixed too much in politics, and LAUD, when Chancellor, said that the college was "as ill-governed as any in the kingdom."

Shooting must have been a very common practice. We find, for instance, that a vestry in county Meath in 1788 passed the following resolution:—"That the constable is hereby directed to shoot any pigs that shall be found

wandering in the streets of Slane or the avenues leading thereto, and that we approve and will support any person or persons who shall put the law in force by shooting any pigs that shall be found trespassing on their fields and gardens." In the town of Ennis wandering pigs were speared by the beadle, and the bodies given to the poor. Why "the gentleman who pays the rent" should have been treated with so much disrespect is not evident, unless his indiscriminate manner of feeding brought danger to the infant population. Pig-sticking is, of course, an Indian sport, and perhaps the Irish may have inherited a love for it from the East. There is, however, more probability of affinity with the East displayed in the practice of burying butter in the earth. In 1650 Sir WILLIAM PETTY, who made the first general survey of Ireland, refers to butter made rancid by keeping in a bog. In the search after antiquities, specimens of butter in wooden vessels have been met with. It is a very common practice in some of the districts in India, and Europeans are willing to pay double the price of fresh butter for what is fermented. From experiments by the Rev. JAMES O'LAVERY, the butter acquires a cheesy taste. He does not enjoy the flavour, but as an archæologist he takes interest in the practice, for as he says:—"Of the branch of the human race that speaks the Indo-European languages, we have the extreme eastern and the extreme western tribes using a common mode of preserving their butter, and to seek the origin of that custom we must go back to the day when the Hindoo and the Irishman were brothers, partaking of the food prepared by the common mother of both—a research which carries us back to the early patriarchs."

The seventh century appears modern if compared with the time when the emigrants of Ireland acquired their knowledge of butter-making in the East. But that century is important, for a great many traditions unite in testifying to the existence of a famous builder of that period—that is, the GOBBAN SAER—a man that, from the feats recorded of him, might have possessed supernatural powers. We are glad to come across a case in which no more is claimed for him than an ability to erect a timber church. In describing the ruins of an old monastery on the bank of the Barrow, in Carlow, the Rev. Mr. FRENCH writes:—

St. Moling having decided on the site, called to his assistance Celtic Ireland's most notable builder, a man whose name and reputation has lasted to the present day, the celebrated Gobban Saer, and he directed him to erect an oratory. We are told that the Gobban, who could construct equally well in wood and stone, erected this oratory of wood, and that the shingles which roofed it were made from the wood of a very remarkable tree. When the celebrated yew tree, the "Eo Rossa," one of the five famous trees mentioned in the "Book of Leinster," fell or was cut down, St. Molaise, or Lazerian, divided it among the saints of Ireland, and St. Moling utilised the portion given to him in making shingles to roof this very oratory, and thus consecrated to the service of God that which had been previously an object of pagan tree-worship. Here we have one of the recorded instances of a church built of wood. There can be no doubt that where wood abounded oratories were constantly constructed of that material; and from a passage in St. Bernard's "Life of Malachy," we learn that "the custom of building oratories of wood was continued in Ireland even to the twelfth century."

It appears St. MOLING was an artist, and a shrine in the library of Trinity College, Dublin, is said to contain drawings of the apostles by him, which are in water-colours.

There is no doubt that good work is being done by the Royal Society of Antiquaries in Ireland, but the members would render still greater services to their countrymen if they exercised their critical faculties. A good many stories (the existence of drawings since the seventh century may be one of them) should be declared to be of doubtful authenticity, although they may have value as legends. In the same way, when remains will not sustain examination, it would be well to point out the shortcomings. The Irish people have such a tendency to see the past through an atmosphere that makes all things beautiful, they are not unlikely to overlook weakness of design and execution. The metalwork of some of the shrines is as delicate as any Indian or Italian filigree, and there is no less patient work to be observed in some of the copies of the Scriptures. But it does not follow that the measure of success attained in the two classes of works should excuse the defects of the Celtic artists when dealing with materials which required a more energetic system of adornment.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Association was held on Friday evening, Mr. H. O. Cresswell, president, in the chair. Mr. W. Petch was elected a member.

Mr. R. PHÉNÉ SPIERS, F.S.A., read the following paper

On the Influence of Byzantine Art in Italy from the Fifth to the Twelfth Century.

The archaeological researches of the last fifty years, and the valuable records which have been left to us in the works of Rickman, Professor Willis, Parker, Sharpe, Scott, Street and Burges among our own countrymen, and Viollet-le-Duc and De Caumont in France, have so far raised the veil of obscurity which hung over that period known as the "dark ages" as to have eliminated from its shadow the second half of the eleventh and the three following centuries. Attempts were made by Hope, Dr. Whewell and Professor Willis to carry back the date, but till within the last few years the entire absence of documentary evidence, the want of a systematic study of the fragmentary remains left to us, and a general inclination to ascribe to buildings a greater antiquity than the civilisation of the precise epoch would admit of, has created some confusion and failed to penetrate the mystery of the period I have selected for my paper. The subject, however, is so vast that I have found it necessary to confine my remarks to a portion of one country only, viz. the north of Italy, and to the influence of one particular style only, the Byzantine, in the development of its art.

The two books to which I am the most indebted for my information are De Dartein's "*Etude de l'Architecture Lombard*," completed in 1882, and Cattaneo's work published in 1890, which bears the same title as my paper, except that I have taken another century in order to include St. Mark's and a large series of buildings which illustrate the extensive influence of the Byzantine style in Italy during the twelfth century.

With De Dartein's work I had long been familiar, and, failing other evidence, had acquiesced to a certain extent in the dates given to the various churches illustrated in it. When, however, in the beginning of 1892, I came across Cattaneo's work, and found so wide a difference of opinion, a new interest was awakened, which increased as I followed the arguments brought forward. It was necessary for me to master the facts in order to revise the new edition of Fergusson's "*History of Architecture*," on which I was then engaged, and it occurred to me that it might be of some interest to the members of this Association, and induce those of you who, in future years, have the opportunity of travelling in Italy to carry further the inquiry. I felt, however, that my statements would come with more authority if I were able to visit some of the monuments in question, so as to be able to differentiate the dissentient opinions expressed by the two authors above named, and also to make drawings or procure photographs of some of the more important details, which would enable you better to judge for yourselves. I could not hope to get as far as Rome, but in the months of August and September last I visited Como, Milan, Brescia, Verona, Vicenza, Padua, Venice, Ferrara, Ravenna, Ancona, Bologna, Parma, Piacenza and Pavia, and studied most of the buildings with which the immediate subject of my paper is connected. The Byzantine influence in Pisa and Lucca, and in the south of Italy at Troja, Bari, Bittonto, Altramura, &c., is of an entirely different type, and was inspired by the work of the later Great Empire. In the north of Italy it radiated from Ravenna, and is of much earlier date.

To place my subject clearly before you, I must commence by pointing out the essential characteristics of Byzantine buildings:—First, as regards plan; second, construction; and third, decoration. I shall only be able to touch on the salient points, otherwise my paper would be one on the Byzantine style, which has already been treated by Professor Aitchison at the Royal Academy. When Constantine transferred the seat of empire from Rome to Byzantium, he rebuilt the ancient town, doubling its size. He surrounded it with walls, and divided it into fourteen regiones or quarters. The buildings which he erected consisted of churches, palaces, thermæ, forums, &c., all of which would seem, from the descriptions given, to have been based on those of the Eternal City, with one important difference: they were so hurriedly built, and in materials of so ephemeral a nature, that none of them have been preserved to our day; in fact, many were pulled down and rebuilt by Justinian two centuries later. Two constructions of his time remain—the Bin-Bir Dereh, or cistern of the thousand and one columns,* and the Yeribatan Serai—two large underground reservoirs for storing water. There is one great basilica, built by Constantine, still existing in Syria, viz. the Church of the Nativity at Bethlehem. This church, and those which are described by Eusebius as having been erected in front of the Holy Sepulchre at Jerusalem, and in other

places, show us that the type of plan adopted was not dissimilar to those which Constantine built in Rome, viz. the ancient church of St. Peter, pulled down in 1506, the church of St. John Lateran, which still exists, and others which have been rebuilt since. In all these Roman examples materials from ancient buildings were used up, temples, tombs and other erections being despoiled to provide columns, capitals, architraves &c. for them. The church at Bethlehem is a simple basilica, with nave and aisles, the columns and capitals being clumsier and more debased than any examples could be in Rome. From Eusebius's description, the basilica at Jerusalem had triforium galleries set apart for women, according to the requirements of the Greek Church. And these galleries exist in two basilicas of later date at Thessalonica, the Eski Djuma and the church of St. Demetrius. Both of these churches had timber roofs. From these we pass to the mosque of Sta Sophia at Constantinople, commenced by Justinian in 532, in which the chief feature is an immense central dome, with eastern and western semicircular apses, and with aisles and triforium galleries, all vaulted, surrounding the central space. This church must be looked upon as the apotheosis of the Byzantine style, and no dome of similar size was ever again attempted in the East; but it gave the key to a new plan, which is usually called the Greek cross, in which there is a dome in the centre and barrel vaults over the nave and transept choir. In later times this dome was raised on a drum in which vertical windows were pierced, and sometimes other domes of slightly less importance over nave transepts and choir, or over the four angles included by them. In the church of the Holy Apostles the four other domes were over the nave transept and choir; in the church of the Assumption, at Moscow, on the angles. A second type of plan is found in the round churches, but these do not differ from much earlier examples in Italy; the most important variation, however, is found in the church of St. Sergius at Constantinople, also built by Justinian, a church with octagonal central space covered by a dome, seven semicircular niches, and a choir with aisles and triforium galleries all round. Towards the end of the sixth century, in addition to the central apse in Greek churches, two others were added to contain altars for ceremonial purposes. As they were always hidden by the Iconostasis, they served a different purpose from that in the Roman Church. It is perhaps more a question of construction than of plan; but I may here note that whilst internally in Byzantine work the apse is circular, externally it is almost always polygonal.* In Western Europe it is always circular unless influenced by Byzantine work.

I come now to the second section, that of Byzantine construction. Besides the architects and workmen whom Constantine took with him to Byzantium, he is said to have exported other treasures, and not only bronzes and marble statues, but even columns and capitals. It was evident, however, that these would, in course of time, come to an end, so that he was probably soon obliged to have recourse to whatever materials were at hand. Of timber he had plenty, but there was no stone except of small dimensions, unless it were imported from distant quarries. The means at his disposal were apparently not sufficient to enable him to undertake those stupendous works in concrete, one of which—the Temple of Peace in the Forum—he had completed in Rome, and which still exists in part after fifteen and a half centuries. He was obliged, therefore, to do the best he could with rubble masonry or with brick, the materials for making which were abundant in the vicinity of the new city. De Dartein points out in his work that brick, when employed as the chief material, exercises a considerable influence on architectural design on account (1) of the regularity of its form and (2) of its restriction in construction. It offers great facilities for the employment of arch construction and tends to replace the architrave or lintel. It restricts the projections of cornices, and on account of its numerous joints it suggests the employment of relieving arches supported on piers, leaving the walls to be filled in afterwards as partitions. What may have been the tentative efforts of Constantine and his immediate successors we know not. The buildings of Justinian's reign already mark the invention of a new style of construction; immense arches, measuring sometimes 5 feet high, of brickwork in two or three rings with huge piers and buttresses are employed in the churches of Sta Sophia, at Constantinople and Thessalonica, the bricks measuring from 18 inches to 20 inches by 12 inches, and $1\frac{1}{2}$ inches to 2 inches thick, with joints of mortar of nearly the same thickness and at the extrados of the arch still greater. Even in smaller openings, from 3 feet to 6 feet span, brick arches of 16 inches or 18 inches depth are used instead of two or three $4\frac{1}{2}$ inch brick rims which we employ. (In the campanile of St. Apollinare-in-Classa, Ravenna, I noted a window 6 inches wide with voussours 14 inches deep. In this case special voussours had been made 1 inch thick at one end and 3 inches at the other, the mortar-joints also differing in thickness in the same way.)

* There are actually only 212 columns, and they are said to have been originally quarried for some great building in Rome.

* The exceptions are the Pantokrakon, Constantinople, St. George's, Thessalonica, and the churches in Central Syria.

In the construction of their vaults there is a much more important change from Roman work; and from the fact that the two great cisterns already spoken of in Constantinople were vaulted in the new manner, we may assume that they were built by Eastern workmen, who carried out the traditional method of building domical structures employed by the Assyrians. In these days and here in England, where Baltic timber is to be had in any quantity and at small cost, we do not hesitate to employ centring for every description of arch, centring which afterwards becomes waste timber. In early times, however, they built without centring, and M. de Choisy's book on "*L'Art du bâtir chez les Byzantins*" illustrates a large number of methods by which this could be done.

The vaulting surfaces were always domical, so that when complete each ring was self-supporting, and by building the rings on an inclined plane, with the bricks flatwise and not end-on, each ring was partially supported by the one beneath. This method allowed of a less thickness being given to the vault and reduced considerably its thrust.

Geometrically speaking, whilst the surface of a Roman barrel vault is evolved by a semicircular ring travelling along a horizontal line, in Byzantine vaulting the line rises and is curved. This is only the elementary form, but in its inter-sections it follows the same principle.

The Byzantine architects also would seem to have recognised at a very early period the fact that a pier or support of a homogeneous nature, such as granite, marble or stone, could carry a greater weight than one built up of bricks; and further, that it might even be of less diameter than the wall carried, provided all lateral thrusts were counteracted. Now in all Roman work the face of the architrave, and in late work as at Spalato, the face of the arch, is in the same plane as that of face of column. In the church of St. Paul, outside the wall of Rome, built 388, where arches are thrown from column to column, the thickness of the wall and the width of the base or die from which the arches spring is equal to the upper diameter of the column. In Byzantine work, however, both are much greater. Consequently the Roman capital, with its ordinary abacus, was neither large enough or sufficiently strong to meet the new requirement. They inserted, therefore, a new feature called the dossieret or impost-block between the capital and the wall above. It has been thought this was a corruption of the old Roman architrave. If so its earliest examples would recall the mouldings of same, but in the Eski Djouma, at Thessalonica, dating from the beginning of the fifth century, it appears as an absolutely new and original feature, designed solely to meet a constructional want, and without reference to precedent. It is not necessarily square, and sometimes two of the sides will project like a bracket. The dossieret, therefore, is one of the most characteristic features of the Byzantine style.

I come now to the third head, decoration. Of external decoration, beyond that which is afforded by the courses of brickwork, or by the brick vousoirs, in which variety is given occasionally by difference of tint, and in later work of the eleventh and twelfth century, when patterns of brick or inlaid tiles were employed, there is not much to be said. It was rather in the interior that the Byzantine artist lavished the resources of his art. In the decoration of the lower part of the walls with panellings of the richest marbles, and of the upper portion and of the vaults and soffits of arches with a vast surface of mosaic, the Byzantines carried on the traditions of Roman architecture, but the treatment was new and original. They restricted the carved decorations to those features which had special constructional functions to serve, such as the capitals and bases of the columns, the lintels and jambs of doorways and windows, or such as were required to emphasise certain lines in the buildings as string-courses or cornices. In all these features they were specially reticent as regards their projection, so as not to clash or form too great a contrast with the large flat surfaces of marble or mosaic. Though many of their capitals were based on those of the Roman Corinthian, or Composite orders, we notice a tendency to change, first, the contour of the capital, which inclines for the bell towards the form known as the cushion capital; and second, the leaves, instead of being so much in relief as to suggest that they were in their origin applied to the bell, on the contrary seem rather to emerge from the solid block. These tendencies become the more apparent when, with a cubical block (the lower angles of which had been chipped off to merge into the circular annulet of the column), they proceeded to set out a scheme of surface decoration and cutting back from the surface, to evolve a new variety of design, partially geometrical and partially of leaf ornament. It is in this class of capital that we find the greatest originality, and in the play of light and shade considerable beauty. In these examples also they seem to have been very fond of undercutting. Piercing holes with a drill is found in the debased work of most styles, but the Byzantine artists turned its effects to more account, and frequently employed it in conjunction with carved foliage of good character. The influence of Byzantine design, however, is chiefly conspicuous

in the decoration of the enclosures of choir-screens, parapets of balustrades, episcopal thrones, ambones or pulpits, and baldachinos or ciboriums. To the results of such influence I will draw your attention later on.

Although the early history of the Byzantine style can be carried back two or three centuries before the foundation of Constantinople, its influence on Italy was not felt till the Empire had become well established; in fact, more than a century elapsed before we find it in the ancient baptistery, the tomb of Galla Placidia and the chapel of St. Chrysologus in the Archiepiscopal Palace, all in Ravenna. In these examples it is chiefly shown in the mosaics with which they were decorated, and which were probably executed by Byzantine workmen. The baptistery at Ravenna is said to have been built by Archbishop Ursus in 380 A.D., but this refers, I think, to the main structure which probably was originally covered with a wooden roof. When in 451 it was determined to decorate it with mosaics, the vault was probably built to receive them. There is no documentary evidence of this statement, but the internal structure suggests that a change from the original design has taken place. In order to bring the thrust of the cupola well within the walls, it would seem to have been lined with eight arcades, of two stores which project inwards about 16 inches, and the pendentives are carried or corbels projecting 10 inches more. Now, whilst the exterior of the baptistery shows no Byzantine influence in its brickwork and cornice, three of the capitals which carry the lower arcade inside are Byzantine, and all are surmounted with the Byzantine dossieret. The dossieret appears again on the Ionic capital of the upper arcades, and the width and depth of the springing base of the arches are greater than the diameter of the column. The corbels carrying the main arches and the pendentives are sculptured with Byzantine foliage. Under each arch of the upper storey are three arcades, the centre one pierced with large windows of modern date, the side arcades decorated with niches and figures in low relief, all executed in plaster. I noted these at the time as being peculiar, and subsequently in the museum at Bologna I came across some Byzantine ivory tablets of similar design.

Whilst the mosaics of the tomb of Galla Placidia and probably the dome on pendentives (the earliest example known) are Byzantine. The walls of the building were built by native workmen, and the bricks are much thicker and of less lateral dimensions than those in St. Vitale and other churches in Ravenna of the sixth century.

The next example in date is in Rome, where in the church of St. Stefano Rotondo, in the outer ranges of arcades above the capitals we find the Byzantine dossieret, and a similar feature is said to exist in St. Angeli at Perugia.

The dossieret is found also in that eastern portion of the church of St. Lorenzo fuori le Mura at Rome, where in fact it might have escaped attention, except that its capitals are fine Byzantine examples crisply carved, and they support the arches of a triforium gallery which I have referred to as an essentially Byzantine feature. Except in St. Lorenzo (where they were added by Pope Pelagius about A.D. 585), and in St. Agnes 630, the dossieret is not found in any other basilica in Rome.

For the next important examples I must now return to Ravenna. Ravenna I might point out was selected in preference to Rome as the capital by Honorius in 396 A.D., and from that time for some centuries it was occupied as such by the reigning sovereigns, hence the importance of its buildings. Theodoric, king of the Ostrogoths, who reigned from 493-525 A.D., would seem, architecturally speaking, to have been a very remarkable man, having erected more monuments than even the later Roman emperors. As the Goths, however, had formed no style of their own, he employed such artists as were at his service, and in the additions he made to the Baths of Caracalla in Rome and in the churches he restored there, he insisted on the ancient Roman style being carried out in its integrity. "We owe everything," he said, "to the Roman artists." For the new works, however, which he proposed to build in Ravenna, he imported artists from Constantinople with whose work he was well acquainted, having spent part of his life in the Byzantine capital. The palace which he built, and of which a fragment only remains, is an imitation of the golden gateway by Diocletian at Spalato, but in it we find, perhaps, the earliest instance of the large thin bricks or tiles which are so characteristic of Byzantine construction. Judging by the mosaics on the walls of St. Apollare Nuovo, in which the palace is represented with columns of two dimensions, the general design was Roman. The principal work of his still exists in the great church of St. Apolline Nuovo, a fine basilican church with twenty-four marble columns, said to have been brought from Constantinople, but more probably procured from one of the Greek quarries by permission of the emperor. They carry capitals of debased Byzantine work, and have dossierets carved with crosses; the archivolt mouldings of the arches above them are debased Roman. The entablature which takes the place of the impost mouldings of the responds are so Roman in their execution that they might almost have been taken from some

ancient edifice. They are decorated with console brackets alternating with bulls' head. The existing choir and apse are of later date, though the Byzantine influence is shown in the polygonal exterior of the latter.

We now pass on to the church of St. Vitale, which was built by St. Ecclesius, Bishop of Ravenna, on his return from Constantinople, A.D. 535, the design of which was based on the church of St. Sergius in that town. Except that, in accordance with native custom, the vaults of the triforium galleries and the central domes are covered with timber roofs (necessitated probably by the difference in climate, and this constitutes the main distinction between Eastern and European domes), the whole construction is so Byzantine that it must have been designed by Greek workmen. Owing to the timber roofs over the triforium galleries it was necessary to raise the hemispherical dome higher than in St. Sergius, so as not to interfere with the eight windows with which it is pierced. Whilst in St. Sergius the lower storey of the eight semicircular recesses has columns carrying architraves, in St. Vitale the storey is loftier and there are arches. The capitals of the lower storey are of the same peculiar basket type we shall find in St. Mark's, but they are not so fine in execution, which suggests that they were carved on the spot by second-rate Greek artists, whilst those of the latter were probably imported from the East. The capitals of the upper storey and those of the choir are identical in their design with examples at Constantinople and in Thessalonica. The vault is constructed, for the sake of lightness, with earthen pots fitted one into the other. This system was adopted in St. Stefano Rotondo in the outer aisles, which were vaulted, and in other earlier examples in Rome.

The great basilica of St. Apollinare-in-Classe, three miles from Ravenna, was being erected about the same time, A.D. 535-45. Its capitals are much more clumsy than those of St. Vitale, and although they are based on examples at Thessalonica the design and execution are due to inferior Greek sculptors. The responds of the nave arches are decorated with ornament in plaster; though clumsy, they are vigorous in treatment, and may have suggested the design of the capitals of the court of the Town Hall at Bologna of the fourteenth century. Here and in St. Apollinare Nuovo the soffits of the arches of the nave are decorated with coffers in plaster, which are, I think, of later date—in fact, sixteenth-century work. The archivolts in both churches are in stone, and close copies of Roman work, which suggests that they were worked by native carvers.

The church of St. Agatha is said to date from the fifth century. It is a basilican church with twelve arcades on each side carried on columns. Many of the capitals, however, belong to the sixth century, and were not carved for the church, whilst others are barbarous copies of the eighth or ninth century. The church was about to be restored when I visited it, and the responds having had their plaster surface scraped off, exposed the arches of the original church, which were carried on piers instead of columns. In Rome, where they had abundant resources, they were able to take the columns from ancient buildings, but in Ravenna they were obliged to content themselves with piers unless, as in the three churches before-named, they were privileged by the Greek emperor to obtain them from Greek quarries. Square piers, however, were much in the way, so that probably in the ninth century, when there seems to have been a revival in church building in the north of Italy, the church of St. Agatha was partially rebuilt, and with materials from more ancient structures. Some of the columns and capitals in this church may possibly have been taken from the Palace of Theodore. Four of the columns are in granite. The ancient apse still exists, and is polygonal externally. The height of the springing of the ancient arches was 7 feet 6 inches from the floor of the existing church. I have since ascertained that further excavations have been made, and the original floor of the fifth-century church, laid with cubes of mosaic half-inch square, has been found at a depth of 8 feet below the present church, which is on the same level as the street, so that if we allow 2 feet for the steps entering the original church, the street has risen 10 feet between the fifth and this century. In St. Apollinare Nuovo the base is 18 inches below the pavement, and in St. Giovanni Evangelist the ancient columns lately found about 5 feet; but these two churches may have had loftier flights of steps in front.

There are two or three other churches of early date in Ravenna, such as St. Giovanni Evangelist, a basilica of the ninth century. Some of the columns of the earlier church have lately been found embedded in the west wall, and they are of much greater size and possess much finer capitals than those in the existing church. In all these examples of the fifth and sixth centuries the Byzantine influence is shown in the dimensions of the bricks used, which measure 18 inches to 20 inches long by 12 inches to 13 inches wide and about $1\frac{3}{4}$ inches thick, with mortar-joints of the same thickness. And this gives a style and a character which are quite unmistakable. The apses also when ancient are all polygonal externally. Passing to other towns, the church of St. Lorenzo at Milan was

rebuilt in the sixteenth century, but on the ancient plan. At present it is an octagonal church with four semicircular apses, each with vaulted aisles round them and triforium galleries over. It was originally the cathedral of Milan, and was mentioned in the eighth century as being remarkable for its beauty and magnificence. It is considered by De Dartein to have been originally a square building with hemispherical dome carried on pendentives. If so, it was probably based on Sta Sophia at Constantinople, but, not venturing to throw a dome of such dimension, they increased its size internally by having four semicircular apses instead of two. The diameter of these, however, was only about two-thirds of width of central centre, in order to obtain proper abutment for the arches and avoid the difficulty which had been experienced by Justinian in Sta Sophia; in addition to this they built a tower at each angle. In the beginning of the twelfth century the dome fell in, and it was replaced by an octagonal one, carried on arches thrown across the angles. It was rebuilt in 1575, and, according to the letters of the architect, on the old foundations, but this time additions were made to the angle-piers, which have transformed it into an octagonal church, but as the sides at right angles to the diagonal lines are narrower than the others, there are still arch pendentives above to carry the dome, which is a regular octagon. The church is so enclosed that very little is visible of the external structure: the only tower I could see is built (about 20 feet above the ground) with the Byzantine type of brick I have already referred to.

The church of St. Fidele at Como, of the twelfth century, seems to be based on St. Lorenzo, except that there is a regular nave instead of one of the apses. Triforium galleries also existed except round the eastern apse, where there is only a passage.

So far I have dealt with churches and other buildings. I have now to direct your attention to what I have called church furniture in screens, ciboriums, ambones, &c. There existed prior to 1873 a bridge near Rome called the Ponte Salaro, which was built by Narses, Justinian's general, on the foundations of a Roman bridge. Its interest laid in its showing the Byzantine method of building parapets. Square upright posts of stone or marble are sunk at intervals, the interspaces being filled with slabs of marble which are fixed in grooves worked in the square posts. The posts are sometimes plain and sometimes moulded or sunk in panels; the principal decoration is found in the panels, and those of the Ponte Salaro have designs on them similar to many examples in Sta Sophia and elsewhere.* In the church of St. Clemente, Rome, the enclosure of the choir (which projects far into the nave) is formed of upright mark posts panelled, and slabs of marble which were removed from the more ancient church, the walls of which have been discovered below the existing one. In 1858, when the lower church was discovered, an inscription was found on a marble architrave which enabled M. Cattaneo to fix the date at 514-25, and the sculptural decoration on a column found with it was of the same epoch as the panels of the screen. This parapet or screen is therefore the earliest dated example in Italy of that peculiar interlaced decoration of which so many examples exist in Ravenna, and which was either imported from Constantinople or was carved by Byzantine workmen. Of these interlaced panels there are at least eight in Ravenna; four perfect examples are now in the cathedral, having been preserved when it was rebuilt. Three are in St. Apollinare Nuovo, and one in the museum. There are some in Rome, cited by Cattaneo, and a more diligent research might reveal the existence of others. They are all types of that peculiar interlacing pattern which influenced Lombard architecture down to the end of the twelfth century, and which even up to the fifteenth century in Venice, Verona and other towns near crop up occasionally. The Renaissance parapets in Verona and Venice owe their origin to this simple but highly decorative method of enriching a pierced parapet. The buildings or features which I have already quoted were executed in the fifth and sixth centuries. In 566 A.D. Italy was subject to a series of disasters. The plague, great floods, intense cold, swarms of rats, and clouds of locusts followed one after the other, and in addition to these troubles there were constant incursions of the northern barbarians, followed by slaughter, pillage and general destruction. All this put a stop to the cultivation of art, and either killed off or exiled those foreign artists who with their families had settled in the country. A century and a half passes without the production of any works except of a barbarous character. A revival seems to have taken place in the beginning of the eighth century, when Luitprand occupied the throne of Lombardy. About this time, 720, the first edict of the Iconoclasts was promulgated, and a considerable immigration of Greek artists into Italy took place (it is possible also that the Mohammedan invasions exiled some from Syria); their work would seem to

* Only the Roman foundations and the small Byzantine archway on each side are preserved in the existing bridge, which was rebuilt in 1873.

have been confined more or less to the decoration of apses with mosaics, and to such ornamental works as ciboria or baldacchinos, ambores or pulpits, choir enclosures, &c. Of these the most remarkable are the ciboria at Valpolicella, Cividale, St. Apollinare in Classe, and other places, the greater number of which are now in museums. The most important church built, and which still remains fairly perfect, is that of St. Maria in Cosmedin at Rome, 772-95, and as it was built for the Greeks who had been exiled by the Iconoclast, and is the first example in Italy of a church with three apses, we may fairly ascribe that feature to Byzantine influence, though, as I have before observed, in the Greek Church the side apses are not dedicated to any saint and, in fact, are hidden by the Iconostasis. The church of St. Salvatore at Brescia (the finest work from which is now in the museum there) and the crypt of St. Philaster under the east end of the Rotondo, are the only two structures out of Rome belonging to this century which seem to have retained their ancient plan. They are more numerous in the ninth and tenth centuries. At Rome the church of St. Maria in Domenica is the only one which has preserved its original basilican plan with three apses—I am, of course, only speaking of those in which I recognise the Byzantine influence). The chapel of St. Sativo at Milan, which is like a small Greek church. St. Vincenzo in Prato at Milan, a church which has just been restored, having been closed for more than a century. It is a simple basilica church with nine arcades on each side carried on columns and capitals with dossierets, some taken from ancient buildings and others carved for the church—three apses and a crypt with choir, one rising from 7 feet to 8 feet above the nave. The baldacchino also dates from the ninth century, being somewhat similar to the example in St. Ambrogio. The church of Agliate, near Milan, dates from the same period, consists of nave without aisles. There also is a baldacchino, and it is curious that in all these three, viz. St. Vincenzo, St. Ambrogio, and Agliate, the raised interlaced ornament of the upper portion is in stucco or plaster painted and gilded. The rich archivolt decorations of the narthex of Angiate are also plaster, as also those of the church at Cividale; the church of St. Agatha, St. Francesco and others in Ravenna; portions of St. Eustorgio at Milan (but much altered in the twelfth century); the exterior of the apse of St. Celso at Milan; the apse with triforium gallery of St. Stefano at Verona; the churches of St. Euphemia and St. Giovanni Decollato at Venice, the latter with elliptical arches in nave, which are said to exist in the cathedral of Caorle to the north-east of Venice. This egg-shaped form of arch is one which was largely adopted by the Sassanians, but I have come to the conclusion that the resemblance is accidental, and that instead of tilting the arch at St. Giovanni, to bring its crown on a level with that of the last and wider arch of the nave, they made it elliptical.

The chief interest of all these examples of the ninth and tenth centuries lies in the fact that they constitute the early examples of Lombardo-Byzantine work. The great artists who came over during the Iconoclastic persecution remained only till the end of the eighth century, and the Lombards were then left to themselves to work out their own style. When compared with the finer works of the fifth and sixth centuries at Ravenna, these later examples show a miserable falling off. Whenever possible they utilise old materials, so that in all these churches (which are of the usual basilican type, with nave and aisles separated by arcades, carried on columns, and out of Rome invariably with the dossieret above the capital) we find old capitals used up with a few new ones, of coarse, and naïve execution in imitation of the old examples. The triple apse reigns throughout, and here and there we come across the polygonal exterior to the apse, as in St. Fosca Torcello, at Murano; in the side apsis added afterwards to St. Apollinare in Classe; and the extended one in St. Apollinare Nuova. There is invariably a crypt, which in some cases is only a few steps down from the nave, resulting in a raised choir, as in St. Ambrogio and St. Vincenzo in Prato, Milan. The principal treasures of these churches are the sculptured parapets of the choir, the ciboriums and the pulpits; and in churches of later date, as well as in museums, we find richly-carved slabs, as in St. Abondio, Como, and capitals as in St. Giovanni in Valle, and St. Stefano in Verona, and, although of far less beauty than the earlier Greek examples, exhibiting an interesting and naïve revival of interlaced work, scrolls, and the more favoured patterns of the vine and grapes, which is found in twelfth and thirteenth-century work, and even later.

(To be continued.)

Mr. WOODTHORPE proposed a vote of thanks to Mr. Spiers. He suggested whether the Greek artists when turned out of Italy had not gone to Arles.

Mr. BERNARD DICKSEE seconded. Interlaced ornament, he said, seemed general all over the world. Could it have originated spontaneously?

Mr. C. F. DOLL said Byzantine influence was to be seen everywhere.

Mr. BOLTON said that the Renaissance architects owed much to the Byzantine influence.

The PRESIDENT put the vote to the meeting, and it was passed by acclamation; and Mr. SPIERS having replied, the meeting terminated.

TESSERÆ.

Greek Sculpture.

IN tracing the progress of Greek art it is most interesting to observe how the true mathematical principles of the human head were gradually adopted. In Greco-Phœnician vases that form of profile called Greek is not found, that is, from 700 to 500 years before the Christian era, but from 500 to 440 its gradual advance is observed, while from 440 to 300 the principle of the straight line is acknowledged in the human profile—a principle the Greeks never departed from, and in time, by the constant study of the human figure, they decided on the rules, the laws and proportions that are essential to the production of a perfect form. In no country in the world can this gradual advance of Greek art, from its commencement to its highest degree of perfection and from thence to its decline, be more advantageously studied than in England. In the matchless collection of priceless specimens contained in the British Museum its progress can be followed step by step, from the early period with its stiff draperies arranged invariably in straight lines and its angular forms and movements of the human figure, to the dawn of intellectual art that makes its primal appearance in the figures of the pediments of the temple at Ægina, but still not venturing to discard the stiff folds of the drapery and somewhat constrained movements in the action of the figure. At length forms of truth and beauty burst upon us with all the splendour of a meridian sun in the perfected and stupendous works of the immortal Phidias, the glory of the Parthenon and the wonder and the law of all succeeding ages, till in the Ephesian temple of Diana and the mausoleum of the Carian king the glories of Greek art are seen setting in clouds of unsurpassed brilliancy and grandeur. Thus faded out of sight the great school of form, appearing in faint flashes of reflected light from time to time, now lost in unutterable gloom and again springing up and assuming almost its ancient glory, to be followed by almost a total darkness. But the laws remain, and if ever the great art of sculpture should be destined to revive again it must upon these lines be based.

Art and Civilisation.

As long as the disunion and anarchy which succeeded the ruin of the Roman Empire endured there was little opportunity for the development of the arts. We find that immediately the discovery of gunpowder and the invention of printing rendered social organisation somewhat more possible and a general object of desire, the arts of design, as no inconsiderable instrument towards the promotion of this end, burst into vigour, and we find them so early as the fourteenth century a principal source of popular instruction in Italy, and one of the chief links of union between the people and their governments. The productions of the fifth and immediately following centuries were rather the feeble endeavours of an expiring than the vigorous efforts of a new age.

Niello.

The transition from engraving on wood to something competent to bear a higher degree of finish, as metal plates, would the more readily suggest itself, as the same change had just been made from wooden blocks to metal types for letterpress printing; but Vasari attributes engraving on metal to a different class of artists, the workers in niello, or inlaid modelling work, a very ancient art used for ornamenting every kind of table utensils, household furniture, hilts of swords, silver vessels for sacred and other uses. This art consisted in cutting the required subject or picture in silver, and filling up the incisions with a mixture of silver and lead, which, from its dark colour, was called nigellum, abbreviated into niello, producing a regular effect of chiaroscuro in the work. From these engravings the artists were in the habit of taking impressions by smoking them, and then, after cleaning the smooth surface with oil, impressing upon the work a damp paper. This was often done with sulphur or fine earth, but the proofs on paper soon became the favourite process, and ultimately led to the invention and use of metal plates, as copper, &c.; and this, again, was followed by the introduction of the copperplate printing-press, for which, as well as the typographical printing-press, we are indebted to the Germans. Thus it seems tolerably clear that the art of engraving with the burin, or, as it is now called, line engraving, owes its origin to the workshops of the gold and silversmiths, for many proofs on paper taken from the works in niello are existing in the Italian collections of art, especially in the Durazzo collection and the ancient Gadi gallery at Florence, and, as Lanzi says, "may be particularly

known from the position of the letters, which, being written on the models in the ordinary way, appear in the impressions from right to left, and in like manner the other parts of the impression are seen in reverse; for example, a principal figure, as a saint, stands to the left, when by his dignity he should have stood to the right, and all the actors write, play, &c., with the left hand instead of the right." Among the earliest books to be found ornamented with prints taken from metal plates, and which may be esteemed as the most celebrated, are the "Monte di Deo" and the "Commedia" of Dante, both printed at Florence; also the two editions of Ptolemy's "Geography," printed at Rome and Bologna, to which may be added the "Geography" of Berlinghieri, printed at Florence, all ornamented with prints by artists whose names are not known. This state of the art was soon altered, and the copperplate engravers, entirely separating themselves from the goldsmiths and other chasers of metals, opened regular studios, placed their names to their works, took pupils, and became altogether a new body.

Greek Art in Rome.

The works of art which were brought to Rome to adorn the triumph of Marcellus were the first productions of Greek art which were publicly exhibited among the Romans, and were the first incentives to the taste for decorating their public buildings with pictures and statues which led to the subsequent universal spoliation of Greece and Asia of their treasures of art. At first, says Plutarch, Marcellus was accused of having corrupted the public morals, since, from the introduction of these works, the Romans wasted much of their time in discoursing about architects and artists. Marcellus however boasted, even before Greeks, that he was the first to teach his countrymen to esteem the exquisite productions of Greek art.

Raphael's Light and Shade.

In the greater part of the cartoons it does not appear that chiaroscuro had more than an ordinary share of attention. In the *Miraculous Draught* plain daylight prevails. In the *Miracle at the Temple Gate*, a more forcible and more sublime effect would have been obtained from a cupola-light and pillars darkened on the foreground. In the *Execution of Elymas*, composition and expression owe little of their roundness and evidence to chiaroscuro. Apposition seems to have arranged the *Sacrifice at Lystra*. If Dionysius and Damaris, in the cartoon of the *Areopagus*, had more forcibly refracted, by dark colours or shade, the light against the speaker, effect and subject would have gained. Considered individually or in masses, the chiaroscuro in the cartoon of *Ananias* appears to be perfect; but the *Donation of the Keys* owes what impression it makes on us in a great measure to the skilful distribution of its light and shade.

The Geology of Surrey.

It may be stated, not as a hypothesis, but as a legitimate deduction from the facts before us, that the portion of the earth's surface which now forms the county of Surrey has experienced the following mutations:—First, it was the delta of a vast river that flowed through a country which enjoyed a tropical climate, and was inhabited by various reptiles, and clothed with palms and arborescent ferns. During this epoch the Wealden strata were deposited. Secondly, this delta subsided to a great depth, and was covered by an ocean, and formed the bottom of the sea for a period of sufficient duration to admit of the deposition of several thousand feet of strata, enclosing myriads of extinct species of marine fishes, shells and corals. This era comprises the formation of the chalk. Thirdly, the bed of this ocean was broken up, and some parts were elevated above the waves and formed groups of islands; while the depressions or basins were filled with the waters of a sea teeming with marine fishes and shells, wholly distinct from those of the preceding ocean, and fed by streams which brought down from the land the remains of terrestrial mammalia, and of trees and plants also of extinct species and genera. These sedimentary deposits constitute the tertiary formations. Fourthly, a further elevation of some parts of the solid strata and the depression of other portions took place, and the dry land was peopled by elephants, rhinoceroses, gigantic elks and other mammalia, whose remains became embedded in the mud and gravel of the lakes and estuaries—the post-tertiary deposits. Lastly, man appeared and took possession of the country; and such of the pachydermata as remained were either extirpated (as the Irish elk, &c.), or reduced to a domestic state. At the present time the metropolis of England is situated on the deposits which contain the remains of the elephant and the elk, and the accumulated spoils of the tertiary seas; the huntsman courses and the shepherd tends his flocks on the elevated and rounded masses of the bottom of the ancient ocean of the chalk; the farmer reaps his harvest in the Weald, upon the soil of the cultivated delta of the country of the iguanodon; and the geologist gathers together from the strata the relics of beings which have lived and died, and whose very forms are obliterated from the face of the earth, and endeavours

from these natural memorials to trace the succession of the physical events which have preceded all human history and tradition.

The Cheapside Cross.

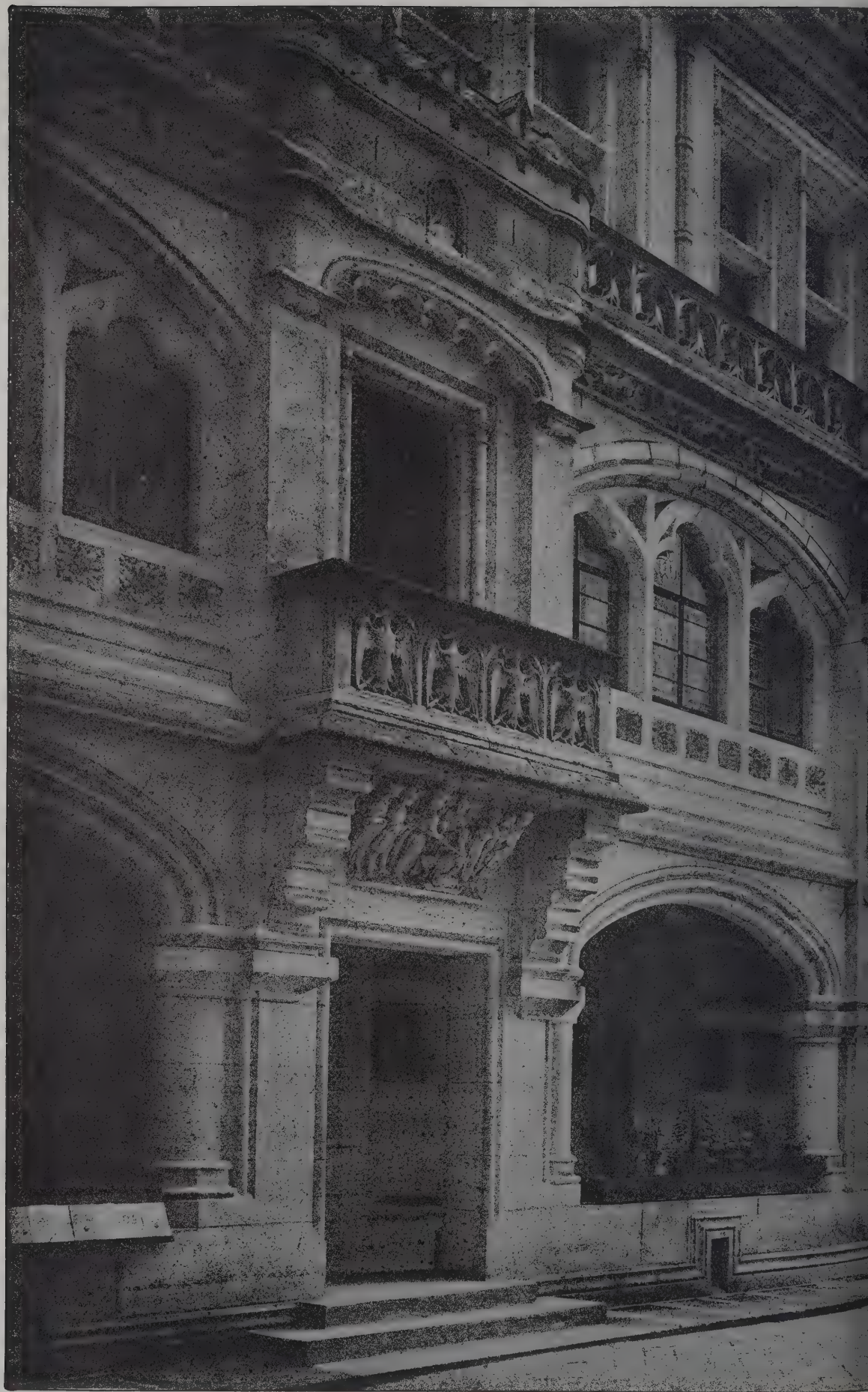
The Cheapside Cross (one of those erected by Edward I. to Eleanor his queen) stood in the middle of the street, facing Wood Street end. Eleanor died at Hardby, near Lincoln, in the year 1290, and the king caused a cross to be set up in every place where her body rested on its way to Westminster Abbey. Cheapside was the intermediate resting-place between Waltham and Charing Cross, and "Magister Michael de Centuariâ, cementarius," was the mason employed in the erection of the cross. Its after-history is interesting. John Hatherly, mayor, "re-edified the same in more beautiful manner" in 1441. It was new gilt over in 1522 against the coming of the Emperor Charles V., and again in 1533 against the coronation of Henry and Anne Boleyn; new burnished against the coronation of Edward VI.; new gilt in 1554 against the coming in of King Philip; "broken and defaced," June 21, 1581; "fastened and repaired" in 1595 and 1600; again defaced in 1609; and finally demolished Tuesday, May 2, 1643, in the mayoralty of Isaac Pennington, the regicide; "and while the thing was a doing," says Howell, "there was a noyse of trumpets blew all the while."

Assyrian and Egyptian Art.

The perishable materials with which the Assyrians were forced to build their monuments and palaces have caused them long since to crumble into dust, and the remains of art are consequently few, but enough is left us to prove that they were a great and powerful people, and that their knowledge of the human figure, the taste and splendour of their dress, the richness and variety of their ornamentation, the beauty of their armour and the perfection of their arms of warfare, all show their superiority to the Egyptian. If it is difficult to decide between these two nations as to which was the originator of art, the lowest form of art in the representation of the human figure is perceived in the Egyptian work. In the productions of this nation huge standing or sitting figures, motionless as death, can be seen. Their artistic efforts are all adopted from the cube, square, angular and straight. If inspected, Assyrian art also exhibits the same angular principle of the cube. But the Egyptians had made the great discovery of the column, or cylindrical form, and introduced it in their architecture pure and simple. This is one of the chief principles of form in art as well as nature, and one great step in the direction of the knowledge of the beautiful. In the Assyrian architecture it was wholly wanting, to judge from the remains that have been preserved or that have hitherto been discovered. The Assyrians made up, however, for this deficiency by the elegant character of their architecture and by their advanced power of delineating the forms of men and animals. Their knowledge of the character of the different beasts of chase, particularly the lion, is astonishing, and their reproduction of the form, action and expression of these animals is not to be surpassed in truth and boldness.

Skew Bridges.

The credit for first arranging arch stones on spiral beds would appear to belong to William Chapman. He was a native of Whitby, but he practised mainly in Ireland and on canal works. He died in 1832 at Newcastle-on-Tyne. It occurred to Chapman that in cases where bridges did not cross roads or rivers at right angles each course of voussoirs should be rectangular to the face of the arch, the beds spiral, the soffits curved and twisted in their sommering, and that the head of each voussoir in the acute angle of the bridge would make an obtuse angle with its soffit decreasing towards the outer edge, whence it becomes acute, and increasing as it approaches the other abutment. The beds of the voussoirs are also twisted in skew arches, and under equal widths of bed the space between the intrados and extrados are increased upon the face as the haunches are approached (in the proportion as the secant of their angle of deviation from a rectangle with a line drawn between each extremity of their soffit). Only the joint at the centre of the arch is rectangular from the face, the others diverging towards the obtuse abutment, and increasing as the haunches are approached, and converging towards the obtuse abutment. The development of the face line of arch convex where acute with abutment and concave with the obtuse abutment. This curve Chapman called "polygonic," and the convexity will depend upon the versed sine of the arch, and that the form of arch to be preferred is the flat segment, that the head of each voussoir on the acute angle makes an obtuse angle with its soffit, decreasing as the crown is approached, thenceforward becoming acute, and increasing as they approach the obtuse abutment. Finlay Bridge, near the town of Naas, over a branch from the Grand Canal, was the first erected by Chapman in the year 1787 on the above principles. It is 25 feet span, with a rise of 5½ feet and the obliquity is 51 deg. or its supplement 39 deg. Chapman admitted that the same idea may have occurred to others, although he never heard of it.



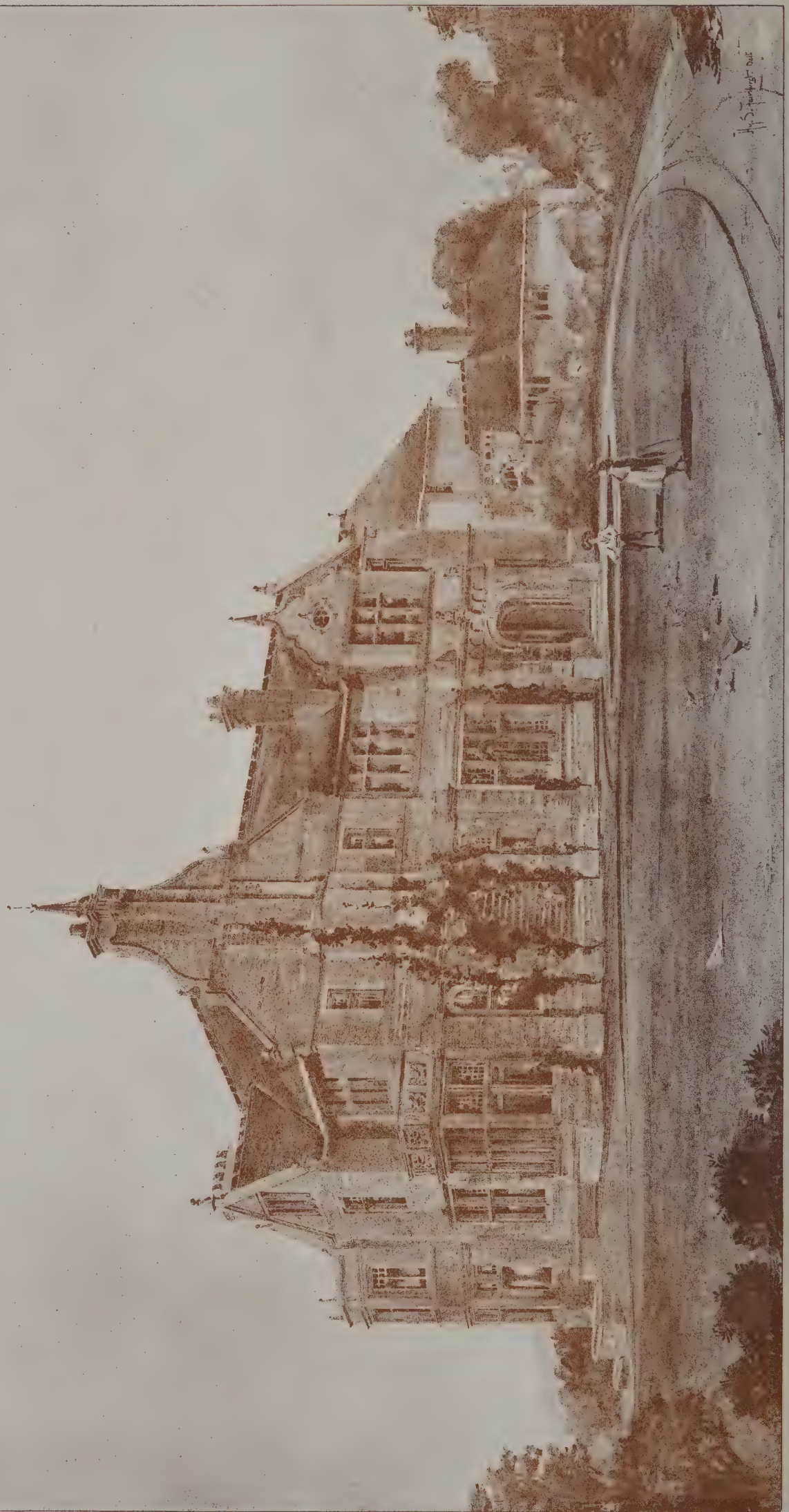
THE CHÂTEAU
As Restored

20th 1893.



INK-PHOTO SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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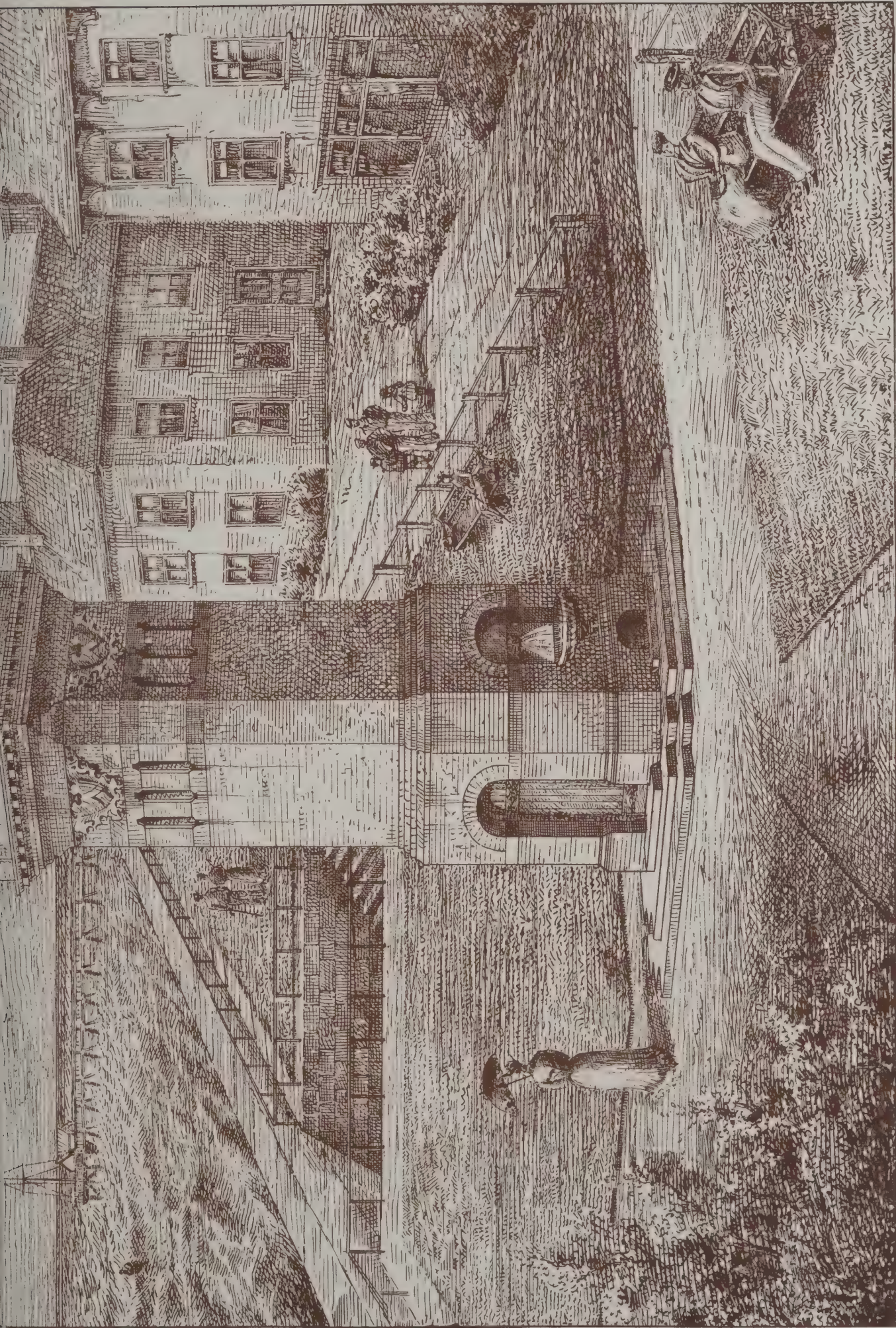




NEW HOUSE, WITTON, BLACKBURN.

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PROPOSED CLOCK-TOWER, WALTON-ON-THE-NAZE.

J. S. MOYE, Architect.

ILLUSTRATIONS.

THE CHATEAU OF PIERREFONDS.

THE château of Pierrefonds being close to Compiègne, the late Emperor of the FRENCH could hardly fail to take an interest in the building. As a consequence, an immense sum of money was expended in restoring the ruins, or rather in a re-creation of the buildings as they were supposed to appear before LOUIS XIII. destroyed them in 1616. The work was entrusted to M. VIOLLET-LE-DUC, and probably it formed his most important commission as an architect, for the outlay was at least 200,000*l.* About three-fourths of the money was contributed by the Emperor. The remainder came from the Historic Monuments Commission. The château, like most of its class, served a double purpose. It was a residence as well as a fortified stronghold. But as there were no representations of the buildings in their perfect state, M. VIOLLET-LE-DUC had to exercise his logic in order to infer what appearance they presented up to the seventeenth century. Practically he had only a part of the external walls to guide him. Opinions differ about the value of the restoration. Some approve of the architect's arrangements, but enthusiastic Gothicists maintain that VIOLLET-LE-DUC was incompetent to realise the beautiful work of the old designers. His modern buildings, where he had free scope, have been subjected to very severe criticism, and it is held that at Pierrefonds he was not more successful than at Coucy or Paris.

HOUSE AT WILPSHIRE, NEAR BLACKBURN.

THIS residence, of which we illustrate the principal fronts, is now being erected at Wilpshire, a fashionable suburb of Blackburn, from the designs and under the superintendence of Messrs. STONES & GRADWELL, architects, of 10 Richmond Terrace, Blackburn. The whole of the building is faced with straight-cut parpoints from Lightcliffe Quarries, Yorkshire. The stone dressings are from Morley Quarries, Yorkshire. The roofs will be covered with PEAKE'S "Perfecta" brown red tiles. The site is elevated, and commands fine views from Yorkshire to the Irish Sea, and full advantage has been taken of this favourable prospect. The general contractors are Messrs. MARSHALL & DENT, of Blackburn, the contractors for the masonry and brickwork being Messrs. E. LEWIS & SONS, of Blackburn.

HOUSE AT WITTON, BLACKBURN.

OUR illustration shows the west and south fronts of residence now being built in this favoured part of Blackburn. The principal rooms command extensive views over the valley of the Ribble. The lawns, terraces and kitchen gardens are all most suitably placed, having due regard to aspect and the contour of the land. The stone dressings are from Morley Quarry, Yorkshire, and the bricks are from the Accrington Brick and Tile Company's Works. The steps, landings, base-course, &c., are of stone from Shorrock Delf, Blackburn, and "Silex" brand stone from Yorkshire. The general contractors are Messrs. J. HIGHTON & SON, of Bridge Street, Witton, Blackburn, Mr. W. H. SIMM being the contractor for the masonry and brickwork. Mr. JAMES S. HARWOOD is acting as clerk of works, and the buildings are being carried out from the designs and under the superintendence of Messrs. STONES & GRADWELL, Richmond Terrace, Blackburn.

PROPOSED CLOCK-TOWER, WALTON-ON-THE-NAZE.

THE town of Walton-on-the-Naze might be made one of the most attractive watering-places in England, but rival interests have prevailed, and it is kept back. The clock-tower, which has been designed by Mr. J. S. MOYE, of Walton-on-the-Naze, will, when erected, be effective in breaking the monotony of the sea-front. Afterwards it may be expected that the neighbouring houses will be transformed.

Mr. Barclay V. Head has been appointed by the Trustees of the British Museum as keeper of the Department of Coins and Medals, in succession to Mr. Reginald Stuart Toole, who retires after forty years' service.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE sixth ordinary meeting of the Institute of Architects was held on Monday evening, Mr. Macvicar Anderson, president, in the chair.

Mr. GEORGE AITCHISON, on the part of the subscribers, presented the portrait of Mr. Alfred Waterhouse, R.A., past president, painted by Mr. W. Q. Orchardson, R.A., and remarked that they now possessed portraits of all the Past Presidents, with one exception, that of Mr. Edward P'Anson.

The PRESIDENT, having unveiled the portrait, then read the following address to students:—

Some Responsibilities of the Architect.

Life is full of responsibility. If this be true of human life in general it is emphatically so of the department which most concerns us—architectural life. Before entering on an undertaking the wise man counts the cost, and so it behoves you, who are about to enter on the career of the architect, to realise at the outset the responsibilities that will beset your path. Forewarned is forearmed. It is from no desire to deter you that I now crave your attention, for I hold that, provided you possess the necessary natural qualifications, the pursuit of architecture is one of the most delightful, as well as useful, avocations in which you can engage; but I have thought to you, whose experience is as yet for the most part theoretical, it might not be unprofitable to learn something of the responsibilities you will be called on to discharge from one who has had many years practical acquaintance with them.

Training and Study.

The primary responsibility, however, which meets you is one which you are yourselves competent to judge of without much assistance or guidance from others. The preliminary to all life-work is training. What is essential in other professions is equally so in architecture. There are those who tell you that artistic instinct is the essential qualification, and that if you have that, technical training is comparatively of little consequence. Without for one moment discounting the paramount importance of artistic endowment, to which I may refer later on, let me warn you against being misled by a doctrine so delusive. True, there have been, and no doubt will be, exceptionally gifted individuals who seem to grasp knowledge by intuition and to leap in a single bound over the laborious methods that have to be pursued by ordinary beings. But to rear on the basis of such rare exceptions arguments applicable to members of a large profession, is as absurd as it is misleading, and at the threshold of your career you may be absolutely certain that there is no royal road to the acquisition of knowledge, and that the only stable foundation on which to build the superstructure of a successful life's work is laborious and enthusiastic study. Hence it devolves on you, as students of architecture, to prepare yourselves for fitly discharging the responsibilities of life by availing yourselves now of such educational advantages as lie within your reach. Until recent years such advantages were hard to find, and it was mainly, if not solely, by picking up casually such knowledge as could be acquired during apprenticeship in the office of a practising architect that the student could educate himself. Now the case is different, and it is, I apprehend, in some measure attributable to the freedom of intercourse with foreign nations inaugurated during this century that such progress as we see has been attained. In France and Germany, as you are no doubt aware, the architectural student has to pass through a regular course of theoretical teaching in the school or the university. The same system is being adopted in America. The curriculum of the Architectural Association, as well as those of University College and King's College, indicate a distinct tendency to adopt, at all events in a modified degree, a similar procedure here, departures which thoroughly deserve all the support and encouragement we can extend to them. I do not desire that the practical training which can only be acquired by contact with actual work in an architect's office should be forestalled, but it is greatly to be desired that such training should be accompanied by theoretical and technical teaching such as is to be found in the courses to which I have referred. In the world's labour one day in seven is reserved for rest. In the routine of apprenticeship* it would be well were one day in seven also set apart for study outside of and apart from office work, and that the office hours were for pupils so arranged as to render it practicable for them to take full advantage of evening classes in the studio and the lecture-room without unduly taxing or injuriously affecting brain-power. That a generous spirit now pervades the profession, exhibited in the

* In the forms of articles published by the Institute it is stipulated "that with the object of enabling the pupil to qualify himself for passing the examinations for studentship and associateship," the Principal "shall and will allow the pupil such absence as he, the Principal, shall deem reasonable for the purpose of attending lectures, classes of instruction and the said examinations."

desire to promote the education of students, is unquestionable. The establishment of teaching centres, not only in the metropolis but in the provinces, demonstrates this.

I have already indicated that the development of this spirit may be to some extent traced to international intercourse, but I cannot doubt that it is more directly attributable to the action taken in recent years by the Royal Institute of British Architects, as the chartered representative of the profession, in inaugurating and establishing a system of examinations, for it is a fact, whether expressly stated or not, that the curriculum of each teaching body is so framed as to meet the requirements of such examinations. Now if the examinations of the Institute had done nothing else, it must surely be admitted by all, be they advocates or opponents of the system, that to have in a few years produced such a result is a distinct gain to the profession, the possibilities of which in the future it is difficult to forecast or to limit. As by the enlightened policy of provincial societies educational facilities are provided, preparatory to local examinations in connection with the Royal Institute, the whole country will be gradually embraced in an educational network, the meshes of which will be occupied by the embryo architects of the future, who will thus enjoy educational advantages which were not at the disposal of we older men in our early days. Hence it seems to me that the Royal Institute, in awakening in recent years to the responsibility of providing education by creating an examining body, and thus stimulating the organisation of teaching bodies, has conferred lasting benefits on the profession.

Having so far discharged our duty, we may fairly call on junior members and on students to fulfil the responsibility thus devolved on you by embracing the educational privileges which are now brought within your reach. Do not imagine that you will thus weaken the artistic instinct with which you may be endowed. The result of diligent study preparatory to examination is not in any sense to cramp or retard artistic development, but to equip you with knowledge which it is difficult otherwise to obtain, and without which no one would now be worthy of the name of architect. Let me, then, press on you the primary responsibility of qualifying yourselves for your life-work by entering on the educational courses and preparing for the educational test, which have been established with a view to your welfare. Quite recently I received a request from one who a few years since was a pupil of my own, and who is now practising in South Africa, that in order to promote his professional status I would propose him as an Associate of the Institute, accompanied by the incidental intimation that he was—I suppose by way of further fortifying his position—about to be married. I had to inform him that the only way to become an Associate was to prepare himself by study for the examination, and I suggested that he might usefully turn to advantage the interesting position he occupied by spending his honeymoon in a visit to the old country for the purpose of passing the examination. I have been tempted to mention the incident because of the sequel, for he has responded by asking me to send him a list of the books he should study and the particulars of the examination. The spirit thus evinced in a resident of a far-distant colony is creditable, and I venture to commend it to your favourable consideration, at whose door the educational privileges lie, which he can only embrace subject to serious difficulty and sacrifice.

Commencing Practice.

Let us now pass from the responsibilities of the student to those of the architect, and assume that you have, after years of study and preparation, attained the goal of having your first commission confided to your care. I have still a vivid recollection of the emotions which this event creates; the sense of pleasure derived from the reflection that at last one is freed from restraint; the enthusiasm with which one anticipates the fulfilment of long-cherished hopes; the delight with which the youthful mind revels in the feeling that now has come the opportunity of teaching the world something worth learning. All such emotions are natural and incidental to the freshness of youth, and the first sense of emancipation from thralldom, and, although subsequently sobered by experience, constitute a bright era of hope and expectation that in after life one recalls with pleasure and would not obliterate. I shrink, therefore, from uttering anything that might detract from the hopeful anticipation with which you rightly regard this event. Only one word would I venture to interpolate. It is natural that in the first blush of actual experience the feelings I have depicted should predominate, and that you should indulge with unstinted satisfaction the prospect of crystallising your long-cherished fancies. But remember that this is not all. The indulgence of your fancy must be duly leavened by consideration for the fancy and wishes of him who has given you the opportunity you so welcome. I know by experience that in early years the tendency is—I admit not unnaturally—to consign this consideration to a subordinate place, or not to regard it at all. Do not forget, amid the exuberant joy of youthful freedom or the justifiable pride of a first success, that your

responsibility is to your client, and that you are bound, while indulging your idiosyncrasies, to do so in giving artistic and practical effect to his requirements and in promoting his interests. Should you ever entertain doubt in respect to the soundness of your advice, a good test will be to ask yourselves whether, were you occupying the position of your client, you would yourselves act in conformity with the advice you are giving him.

Architectural Design.

You will now have entered on the part of an architect's experience in which unquestionably is to be found the most absorbing interest and the keenest pleasure—the creation of design. This is the most elevating sphere in which you can work, because it opens the field for the exercise of your inventive faculties. Call it instinct—call it genius—call it what you may—here is education exhibited that makes the architect, and without which he is not an architect at all, the spirit of the artist. Cherish this native inspiration. You cannot create it by human agency. You cannot destroy it. But you can misapply it, or you can by discipline and control make it the medium of conferring lasting benefit on your day and generation. Responsibility attaches to every faculty, every talent we possess, and for the cultivation and use of this inspiration—the indispensable, as it is the noblest, qualification of the architect—you are responsible to Him who endowed you with it. Let this ennobling consideration inspire your work. When I refer to artistic design, I desire not to be misunderstood. To apply it to the design of the elevation only is unjustifiably to restrict its sphere, for the plan offers the primary, and perhaps the most important, field for the display of artistic skill. I must not dwell on this, having on a previous occasion specially treated the subject of the art of planning, but I venture to express the hope that I then succeeded in demonstrating the conviction I strongly entertain, that no part of an architect's work, from an artistic point of view, is more important than the study of the plan. I have referred to the responsibility of regarding your client's wishes and studying his requirements. Let me here say that to do so is not only a duty, but it is often the means of imparting to work its highest interest. To embody in design one's own fancies is comparatively easy; to combine one's personal proclivities with the requirements of a client is frequently most difficult. Difficulty creates interest, and to succeed in spite of it is always enjoyable, and imparts to any work a zest which it would not otherwise possess.

Working Drawings.

The general design approved, you will have to proceed with the preparation of working and detail drawings, in which you will find the continued opportunity for the exercise of creative power. Every part of a building drawn to a large scale, and every detail drawn full size, form subjects of constant and engrossing study, a true idea of which can only be acquired by experience. Apart, however, from the interest of design embodied in such drawings, it must never be forgotten that they are in their character and object totally different from preliminary sketches. The latter are prepared for the purpose of illustrating the design, and when once it has been embodied in the working drawings they may be said to have served their purpose. Working drawings, on the other hand, are records on the basis of which the interests of others depend. From them the quantities are measured. Upon them the contract is framed. Hence it is obvious that you will be responsible for making such drawings clear, precise, definite, practical. Anything like sketchy indecision admitting the possibility of a twofold interpretation—any contradiction between one part and another, or one drawing and another—anything in the nature of slovenly draughtsmanship—these and such-like careless defects are unpardonable. Working drawings are not worthy of the name unless they are drawn with decision and accuracy, consistent with one another, finished in ink, coloured and reproduced in duplicate. You may naturally think that this goes without saying, but experience proves the reverse. It is because I have not infrequently seen working and detail drawings, prepared by so-called architects, which I have regarded as discreditable and unworthy, that I venture to urge upon you what I consider will be your responsibility in this respect. It is simple injustice to those whose interests are affected by them that working drawings should be other than unmistakably clear and definite. This does not necessarily imply that they must be devoid of artistic feeling. I have seen many, admirable in respect of their succinctness and charming in respect of artistic draughtsmanship. Let me say that where practicable it is most desirable that detail drawings should be prepared prior to the quantities being completed, in order that there may be no room for misconception as to the amount of work intended and the labour on it. I am well aware—only too well—that the rush with which much modern work has to be prepared—greatly to be deprecated—often renders this impossible; but whenever it can be done it should be done, for the advantages to all concerned are obvious.

The Specification.

Following on the completion of the working drawings, your next responsibility will be the preparation of the specification, the proper execution of which is of the greatest importance. Allow me to press upon you, from experience, the enormous advantage of writing your own specifications. No one can so clearly describe what he wants as the architect himself, and there is no valid apology for a young man failing to discharge this essential part of his duty. I always did so, until the pressure of work rendered it impossible to continue the practice. The work, I admit, is dry and uninteresting as compared with design and drawing, but it has an interest of its own, as all work has when honestly engaged in. Besides, it is no excuse or apology for the neglect of a part of our work, that it may not be so engrossing as other parts. That which is most unpalatable is frequently most beneficial, and a well-disciplined mind will take the bitter with the sweet, and strive to do all alike well. To write your own specifications is to be familiar with every detail in a sense in which you cannot otherwise be. On your visits of inspection during the progress of the work, you will find yourself master of the situation with every detail at your finger ends, in place of being dependent on others or constantly requiring to be refreshed by reference to a document with which you are only partially familiar. A specification, to be of use, must be full and clear, describing in terse language every branch of work, and leaving no room for doubt in the interpretation of its clauses. It should also have ample marginal notes for facility of reference. Much time will thus be saved. To write a specification is not artistic, but it is instructive work, and involves much consideration in respect to the nature of materials and alternative methods of construction. No one can properly write a specification who does not possess some practical knowledge of the building trades and the materials employed in each. Hence, to leave the preparation of the specification in other hands when you can do it yourself is deliberately to abandon the means of keeping yourselves in touch with much of the scientific progress of the day in its relation to architecture. Never, therefore, be induced to relinquish the personal discharge of this responsibility, so long as it is by any means possible to accomplish it.

The "Quantities."

With the completion of the drawings and specification other personages come upon the scene, in relation to whom your responsibilities will be extended. The appointment of the quantity surveyor will generally rest with you, and you will find it of the utmost importance to secure the services of one who, having acquired a thorough practical training, is conversant with the details of each trade, and who is quick and accurate. These qualities, combined with experience, will alone inspire the necessary confidence. The customary practice of including the charges of the quantity surveyor in the builder's contract and account does not commend itself to my judgment. For many obvious reasons, it would be better that they should be charged direct to the client and paid direct by him, subject to the approval of the architect. Need I add that the charges of the quantity surveyor, whether made direct or embraced in the contract, should, in every instance and without exception, be entirely independent of the charges of the architect? For the architect to participate, in any form whatever, in charges made by another, instead of being made direct to his client, would be alike unjustifiable and dishonourable. The practice with some architects is to take out their own quantities—a practice which very generally prevails in the provinces, though comparatively rare, I believe, in London. That such a custom is remunerative goes without saying, and it is justified on the ground that the necessary dissection of the building in the bills of quantities makes the architect more familiar with every detail than he would otherwise be. For my own part, while there is, of course, nothing dishonouring in the practice to those who care to engage in it, I consider that it is not in the least degree necessary on the ground stated, and that, in the case of one aiming at a purely architectural practice, it is not desirable. If an architect is not sufficiently conversant with every detail after having designed the building and prepared the working drawings and specification, he must be obtuse indeed. You will find quite enough to engross your time and thoughts in what—to my mind at least—is the more legitimate domain of architecture.

The Contractor.

To the contractor who engages to carry out your designs in accordance with your working drawings and specification, you will stand in a relation of undoubted responsibility. You will be the medium by whom arrangements between your client on the one hand and the contractor on the other hand will be made. You will thus occupy the position of an agent, and cannot be relieved of its responsibilities. You will have to see that the contract is fairly and honourably carried out by both parties to it—protecting your client on the one hand from any attempt at evasion by the use of faulty materials or defective workmanship, and protecting the contractor on the other

hand from any tendency to deprive him of legitimate remuneration for work properly executed. This dual responsibility you will only be competent to discharge by possessing such practical knowledge of materials and workmanship as will enable you to judge what is good and what is defective, and by uniformly maintaining an attitude of independence and integrity. I have met with clients who have not hesitated to condemn contractors as a class whose habits are predatory and who live on robbery, forgetting that there have been those in their own position to whom such strictures, if fair in the one case, would be equally so in the other. That such sweeping condemnation is unjust I need scarcely say, and your responsibility will sometimes consist in protecting the honourable client and the honest contractor from its injurious effects. My experience of life has been that one class is morally no worse or no better than another. Human nature is much the same, regardless of external circumstances. Morality is an individual not a class distinction. It has been my fortune and I trust it may be yours to meet with but few clients and few contractors whom I could regard with feelings other than those of respect and confidence. The large majority have been men whose gentlemanly courtesy on the one hand, and whose admirable work on the other hand, have reflected credit on themselves and inspired confidence in others.

Conduct of Works.

In superintending the execution of your designs you will find ceaseless pleasure, for there is a singular fascination in watching the gradual development of your ideas and their translation into a material and durable form. You will, if you care for your work, experience regret—as I have often done—that you are unable to live on the work, as the monks of old did, personally judging of each feature and detail in the position it is to occupy. Seeing that this is impossible in modern practice, it will be necessary for you to have a resident representative or clerk of works. In the selection of this official the greatest care and circumspection should be exercised. Practical experience, moral integrity and tact are indispensable qualifications. Once find a man on whose honour you can rely, and whose efficiency has been demonstrated, part not with him if you can help it; he is invaluable, and worthy of being regarded as a friend indeed. But your responsibility will in no way be diminished by reason of your having such a local representative, for without periodical visits of inspection it would be impossible that you could attest that the work had been properly executed, or that you could append your signature to documents certifying that the contractor is entitled to payment. To sign a certificate should never be regarded as a matter of form; it is, on the contrary, a serious responsibility which your client will rightly expect you to discharge with fidelity. In superintending work, knowledge of materials and workmanship is essential, but knowledge of men, and tact in exercising it, are also invaluable qualities. Firmness, combined with tact and courtesy, will educe willing and cheerful compliance with your instructions, where mere bullying—too frequently resorted to—will only lead to opposition and induce contempt.

Responsibilities of Neighbours.

Besides those I have mentioned, there are others to whom, in practice, you will occupy a position of responsibility. I cannot refer to all. Take one as an illustration. Most of you will in due course be called on to build in London, and you will in that event have to deal with the complicated Acts of Parliament controlling Metropolitan building, and specifying the relative obligations and privileges of building and adjoining owners, for one or other of whom you will have to act. To rightly interpret Acts of Parliament is not always easy, and if I may venture to say anything so heterodox, I fancy difficulty is occasionally experienced even by those whose official duty it is to enforce them; but there are, I think, certain general principles which should always inspire our responsibility. Building and adjoining owners, whoever and whatever they may be, have one common characteristic—they are neighbours. Many centuries since the question was asked, "Who is my neighbour?" It would be well were the spirit which inspired the reply more frequently found to pervade the negotiations between those neighbours with whose responsibilities architects are sometimes concerned. Too often is the building, or the adjoining owner, as the case may be, regarded as one whom it is well to pass by unheeded, one whose interests are opposed to our own, one who, if he has the chance, will take advantage of us, and one, therefore, of whom we are perfectly justified in taking advantage. I do not draw a picture that experience does not justify. Who has not heard of work having been pushed forward to completion with undue haste, or in the dull season, in the hope that, once done, it will remain, whether it inflicts injury to a neighbour or not? To designate such procedure as sharp practice is to use too mild a term; it is dishonest, dishonourable and worthy of all reprobation. Apart, however, from its immorality, it is stupid. Honesty not only commands the approval of conscience, but in such matters it is the best policy. You are much more likely to get what you want from a neigh-

bour by approaching him in a straightforward spirit, treating him with frank confidence and asking his permission to deal with joint property in the manner you wish than by unworthily trying, directly or indirectly, to take advantage of him. Do as you would be done by is the motto of the Christian and the gentleman, which I commend for your invariable adoption when discharging your responsibilities in connection with the interests of those who are neighbours.

Practice and Art.

Now it may have occurred to you that in regard to some of the responsibilities of the architect to which I have referred, it is difficult to trace any direct connection with art. The drafting of a specification, the arrangement of the conditions of a contract, the adjustment of differences between your client and the contractor, the treatment of the rights of your client in respect to his neighbour; or, again, the provision and arrangement of sanitary appliances, or the endless correspondence on mere matters of business which occupies so much time—these and other matters of a similar nature cannot by any stretch of imagination or any exercise of ingenuity be brought within the category of artistic work. Yet these are unquestionably responsibilities the discharge of which properly falls on the architect, and the neglect of which involves the necessary sequence that he fails in his duty to his client. Is it, then, true that the avocation of the architect is a purely artistic one, and that such matters as those which I have just specified should be relegated to the surveyor or the engineer? If so, then much of what I have said to you of your responsibilities is false teaching. But I appeal to common sense—I appeal to universal experience—nay, more, I appeal to the practice of architects who are undoubted artists, to demonstrate that the assumption is unfounded. I have, I hope, said enough to satisfy you that I consider your noblest and highest responsibilities will be found in the development of your artistic faculties in design. This is indisputable. To design in truth, purity and with artistic feeling, is unquestionably the most elevating attainment to which you can aspire, success in which will constitute the keenest pleasure you can hope to experience in your professional career. This is the most important part of the architect's work, but to assert that it is all is deliberately to close the eyes to patent facts in the vain effort to establish as truth a purely visionary theory.

Gentlemen, in this necessarily brief survey I have touched on some only of the responsibilities which you will be called on to discharge in the practice of your profession. Others will occur to you on which I might have dwelt had time permitted. One, however, remains, reference to which I dare not omit—your responsibility to yourselves. In this, after all, is to be found the key of the whole position. Be true to yourselves and you cannot but be true to others in every relation of life. Truth must and will prevail. Enthroned in the heart, it will find outward expression through the intellect in design and through the courtesies of life in practice. If true to yourselves in the earnest preparation for your career by diligent study and laborious research—if true to yourselves in the firm resolve to develop to the utmost those faculties with which you may be naturally endowed—if true to yourselves in the lofty ambition to consecrate your powers to the promotion of art and the benefit of the community, you will not only be true to all others, but you may cherish the well-grounded hope that you will attain success. And in all your struggles and efforts to discharge with fidelity the responsibilities of your calling, remember this, that you will not be less likely to inspire confidence and attain success as architects if you constantly bear about with you, in the complicated relationships of your professional life, the unmistakable characteristics of gentlemen.

Review of the Students' Works.

Mr. WILLIAM EMERSON, the hon. secretary, said:—It is my duty to make a few observations on the work submitted in competition for this year's prizes and studentships. I do not propose to make, nor would time allow of my making, a careful criticism of every work. I shall, therefore, confine myself to noticing a few of the principal sets of drawings and to making some general remarks, and I must say I feel acutely the position in which the President has placed me by asking for critical remarks, for the reason that criticism directly puts one in an adverse attitude, like one who is in search of defects and errors. I trust, however, I may be forgiven for any remarks I may make. In self-defence I must say that, in examining so many splendid sets of drawings, it was very much easier to be attracted by many beauties than hunt for defects and errors.

For the Institute Medal and twenty-five guineas only two gentlemen competed, and the essay, by Mr. C. Bernard Hutchinson, under the motto "*Persevera per severa*," was considered by the judges to be the better of the two, on the ground that it showed considerable research. But the primary object of this prize when instituted was, I take it, to be an encouragement of literary attainments amongst the rising

generation of architects. What would most of us know about architecture were it not for the works and writings of members of the architectural profession, both in ancient and modern times? Such names as Vitruvius and his many translators and commentators, Serlio and Palladio, Desgodetz and Blondel, Chambers, Pugin, Viollet-le-Duc and Street, one would think, might inspire more than two students a year to some effort in this direction. Research is not only what is required; the career of an architect (not to mention the chance of his publishing some architectural work) constantly involves him in reports and descriptive writings of all sorts, to be laid before all classes of people, for which style and good composition are essential. These two essays are weak from the literary point of view, and for this reason the Council have not awarded the medal, but each competitor has been allowed five guineas. Let us hope that next year will show some better result.

The Institute Silver Medal with ten guineas for measured drawings of an old building has this year produced only three competitors, and the award has been made to Mr. George S. Hill (motto, "*Saint Kentigern*"). His drawings, which are of the crypt of Glasgow Cathedral, show very considerable pains, are very well done, and the figured dimensions are carefully marked on them. I do not feel sure that the full-size mouldings are altogether accurate, but they may be, as there is some curious detail in this building, which is not of the best. Mr. Hill's Sketch-book notes are very full. The drawings of Lacock Abbey (motto, "*Red Thistle*") are also exceedingly careful and praiseworthy, and they are beautiful drawings. In the third set submitted nearly all figured dimensions have been omitted, and seeing that these are essential under the conditions laid down, it argues carelessness in their author; it is a pity to go so far and then fall short on a crucial point. It should be remembered that for measured drawings you can scarcely make too many notes or take too many dimensions.

The Soane Medallion and a sum of 100*l.* for foreign travel has this year brought out fifteen competitors—I believe as large a number as we have ever had. Perhaps the subject—a railway station—was a congenial one. The design which gains the medallion and 100*l.*, with the motto "*Inexorabile Tempus*," is by Mr. Arthur T. Bolton, an Associate. His plan is a very workable one. In all probability the iron roof over the station would stand, while in many of the other designs sent in it certainly would not. The arrangements seem good, but the architecture can hardly be considered of a very high character. It has a small resemblance to the Potsdamer Bahnhof at Berlin, but the composition of the main façade of that building is very much better. The lines of the gable and the angles it forms with the towers are awkward in Mr. Bolton's design. There are examples of this treatment in Italian work, but they nevertheless are rarely happy. It seems a pity, when the large arch is suggested, that its form should not have been followed in the opening it encloses, instead of the one shown, the shape of which is rather ugly. This design was nearly losing the Travelling Studentship, in consequence of the inferior drawing of the perspective and the poor entrance. It is worth while practising perspective drawing, for by it only can your design be effectively shown. The detail, too, is somewhat eccentric, though less commonplace than in the design placed second, which is by Mr. J. Scott Stewart (motto "*Loco*"); who obtains a medal of merit and ten guineas. In this design there appears to be insufficient abutment—or, rather, the abutment is not carried up high enough, for the large iron ribs to the roof over the station, which ribs, however, seem quite the best constructionally. Besides which, the plan is not quite so well arranged as in the one placed first. There is nothing objectionable in it, but, on the other hand, nothing to raise it much above the commonplace, though it is a very sensible and businesslike composition. The third accepted design, obtaining a medal of merit, by Mr. Alfred C. Houston (motto, "*Ad Rem*"), the Ashpitel prizeman of 1892, is in most respects the best as far as plan goes. It is perfectly symmetrical and well-balanced, and bears evidence of considerable study by a very practical mind. The arrangement of abutment to the iron roof is well considered, though it is doubtful if the sectional area of the iron columns, or the portion of masonry on which the weight of the huge principals falls, is sufficient. But there seems an unfortunate want of judgment as to the fitness of things when the external effect of the design is that of, say, a town hall, hotel or elaborate Board school, rather than a railway station. If the subject be a station, the principal feature of which is an enormous roof in one span, why mask it altogether or conceal it? There can be no doubt that in such designs the first thing to be considered is a workable plan properly answering the requirements, as economical as possible according to circumstances, and the second thing is that the design should be as artistic as possible, for therein are comprised suitability to the subject, good proportions, the right materials to be employed and beautiful detail. If the design does not look like what it is intended for, you may depend upon it that it is wrongly conceived. There should be no possibility of mistaking a church for, say,

schools, or of mistaking a prison for a workhouse, or a hospital for a hotel, or a railway station for anything else.

Notwithstanding many defects which must necessarily be found in students' designs, the above-named designs are worthy of very great praise for the thought bestowed on them and for their very careful delineation.

Following on these remarks I cannot but condemn in a friendly way a design which has for its motto a green device. Though there is some very pretty and attractive drawing in parts of this design, the plan is in the first place hampered by the introduction of two large towers, the supports of which cause difficulties about the booking-office and block up too much of the available space. Moreover, the arrangement is not sufficiently considered; as an instance, the board-room is on one side of the building while the secretary's office is on the other. A good deal of time and drawing has been expended on decorative details, to say nothing of the two towers before mentioned, which are absolutely unnecessary and unsuitable for a railway station, and in reference to this design I would remark that peculiar or eccentric detail (say, for instance, the arches over the entrance) does not necessarily mean original or new beauty of detail. The same remarks as to unfitness apply to all those designs which have lofty towers or campaniles as adjuncts. I lay stress on this because an ill-thought-out plan can never be made a good one by the addition of useless features or decorative details, however well they may be designed; on the contrary, their introduction usually tends to hamper the usefulness of the plan and leads to numerous difficulties. Just in passing from these sets of drawings I would mention that one competitor who introduces an enormous tower has clearly little idea of either fitness of design or proportion and strength of material. His tower is so marvellously out of scale as to be positively wonderful, and he introduces a tie-beam to his wooden roof some 4 feet deep and more. It seems to me that these valuable prizes induce a number of young men to waste a good deal of time in preparing designs for which the amount of architectural knowledge they possess is quite insufficient, which time would be more profitably expended in study. Would it not be possible to restrain this exuberance of youthful energy and conserve it in some way for more effectual later efforts?

For the Pugin Travelling Studentship some very beautiful drawings have been submitted, and those by the successful candidate, Mr. J. J. Joass, show a good selection of subjects and evince truly artistic feeling; in these careful drawings there is no strained effort to obtain a meretricious sketchy effect so much in vogue just now, as if a pretty drawing were the sole object to be aimed at by a student in delineating architecture. On the contrary they are well and carefully drawn, and one can make out clearly what their details mean. And the same may be said of the very excellent work of Mr. T. A. Sladdin, who obtains a medal of merit. The third, Mr. Harold Brakespear, who is honourably mentioned, has evidently great power of draughtsmanship and command of his pencil and shows one or two carefully drawn examples.

I may say that most of the sets submitted for this studentship are exceedingly good and interesting, and well worth looking at, evincing great industry in pursuit of the knowledge of architecture, but it is curious to see how the drawing of the plans and sections of ornamental detail is shirked; some hardly show a plan of anything. How can the detail of, say, an elaborate screen with niches and canopy work be properly understood if you only sketch the elevation and omit all delineation of projections? The three gentlemen who have obtained prizes in this studentship are exceptions to this, I was going to say, unfortunate rule, and their plans and details are exceedingly careful.

For the Godwin Bursary, Mr. Banister F. Fletcher is the successful candidate. He goes, I understand, to the World's Fair at Chicago, and will bring back a report on matters connected with architecture, for the benefit of the Institute. As there were only three candidates, I presume the practical subjects of sanitation, warming, ventilation, &c., do not commend themselves to the architectural student of to-day, though, nevertheless, they are important factors in an architect's practice.

The Owen Jones Studentship has brought forth one of the best series of studies of colour, by Mr. Alfred Hoare Powell, ever submitted to the Institute. These are all careful drawings to large scale, some being full size, and with a remarkable feeling for colour. Mr. Powell is to be congratulated on his artistic capacity. It is a pity that only two of his drawings show architectural colour by the juxtaposition and combination of coloured building materials. But his studies of colour decoration, especially those of the beautiful screen at Southwold Church, are worthy of the highest commendation, and I for one shall look with interest to the result of his studies abroad. His subjects are carefully selected.

Mr. A. N. Paterson, whose work is also exceedingly good, has submitted a selection of coloured studies and of pencil drawings of Italian architecture, in which coloured materials are used, but in the latter he has carefully omitted all colour,

which, seeing that this prize is mainly for that, is a little curious.

Mr. Francis Masey's drawings are very pretty, many of them are just what an artist might delight in doing, but they hardly show serious study of the methods of introducing and applying colour to architecture, and I do not quite see what trees and rocks have to do with the subject, unless they happen to be in mosaic or coloured sculpture.

For all these travelling studentships thought and care should be taken, first in the selection of the subjects and then in the method of their illustration; for a study one does not want so much a pretty sketch of the general effect with adjoining scenery as careful details of the arrangements, tints and methods of application of the colour. In frescoes or mosaics one would like to know, for instance, if the outlines of the figures, trees or buildings, &c., represented are in brown or black, and whether the shades or drapery are of a deeper tone than the general local colour or different, and if so what colour; and how the tesserae are arranged, either by horizontal or concentric lines or placed at random; and whether details of features or limbs or folds of drapery are shown by hard lines as in early glass, or by shade as in later periods. No small scale water-colour drawing can show such details as these, which are most necessary in arriving at a knowledge of how to produce certain effects to be seen either at a distance or close to the eye.

The Tite Prize, the subject being the "Interior of the East End of a large Town Church," is obtained by Mr. C. A. Nicholson (motto, "Omnia honeste et secundum ordinem fiant"), whose plan is well arranged. The whole design is in fair keeping throughout, but seems hardly serious enough for a church; such a subject would, in my opinion, be better for severer treatment, and the broken pediment over the altar might be replaced by something less frivolous and in better proportion. This is, however, a pure matter of taste, or shall I say a matter of pure taste on which some may think diversely? The organ is usefully and sensibly placed at the side in a gallery, and open to the transept as well as the choir, but the height to the roof above is hardly sufficient for free emission of sound; the orchestra is also well considered. The organ-case is full of original detail, very charmingly and nicely designed and showily drawn, though in the splashy and tricky style not to be commended. The work would have impressed one more had it been shown by sober, clear, fairly drawn and finished lines. It is evident Mr. Nicholson has thought rather more of the effect of his pretty drawings of detail than of the real architecture of the church. The general proportion is defective; the details of his main cornice, and the coffers in the soffits of his large arches, and the way some small arches spring from the imposts, might have been much better if a little more considered by one so exceedingly clever. Regard, I am glad to note, has been paid to the convenience of communicants by the introduction of side exits—a most necessary arrangement for a crowded town church; but a slight alteration would be requisite to the seating in the side chapel.

In respect to the design "Bramantino," by Mr. R. S. Dods, which obtains five guineas, one cannot but feel that thirteen steps up to the choir are decidedly too many, as the congregation half-way down the nave could hardly see the altar, and certainly not when kneeling; also there is no side exit for communicants, the omission of which always causes confusion. The detail of this design is less interesting, and has not the same life and originality as that of the one placed first. The lighting is also defective. Coming only from the small aisle windows and the lunettes above the cornice of the choir, it would be insufficient for a London church, and cause the altar and organ to be decidedly in the dark.

In respect to the position of the organ I cannot help feeling that there is a want of judgment as to the fitness of things in overshadowing an altar by the organ placed immediately behind and above it, as suggested in this design, and also as in the case of the plans marked "Modern Worship," where a huge screen supporting the organ and gallery for musicians is placed immediately in front of the altar, which is seen through it. Surely a church is an edifice constructed to enclose—or may I say a casket erected to contain?—the altar at which the worship of God is celebrated as the principal object, and also to shelter the worshippers, while the organ is simply a very important though secondary adjunct necessitated by the services held. Therefore to place the organ in a position which causes it to appear almost, if not quite, a more important feature than the altar—to say nothing of the distracting effect to worshippers of musicians immediately in front or over it—cannot be otherwise than wrong. There seems a want of really thoughtful feeling about such a suggestion, and whatever the framers of the report on musical arrangements in churches may say, I should think, if there is no other logical way than this out of the maze of instructions they have given, the report had better be modified. Indeed, I think the particular attention paid to the report on musical arrangements in churches has caused most of the competitors to think too little of the first and most important

consideration necessary to a town church, where large congregations and a number of communicants may be reasonably expected to attend, namely, that of making a convenient plan.

In the design marked "Crescendo" there is no side exit for communicants, and too narrow a space between the altar steps and the communion-rail, so that the clergy could not pass behind each other while communicating, but I notice that in this point his plan and section do not agree. "Modern Worship" would also be very inconvenient for communicants; indeed, most of the designs are weak in this point.

In "Incognito's" plan communicants must either kneel at the step at the end of the stalls, where only a length of 12 feet is provided, or nearer the altar on the next steps, which are three in number. Now one cannot kneel on three steps, or at any rate should not be asked to do so, nor even should there be two steps to the altar rail, for the officiating priest would be a step higher than the kneeling communicants, which would oblige him, especially if tall, to stoop considerably, a very tiring proceeding where many receive.

The design marked by a device of three circles is more a cathedral than a large church, but the organ and orchestra at the west end form decidedly a better arrangement than placing them either behind or in front of the altar; but it would require a small choir organ, which is omitted to be shown. By electric action both might be played from the same keyboard in the choir.

Hardly any one of these designs is very good in proportion. I said just now the first thing to be considered was a good plan, and the next a good elevation, and I now say the first and most important point to be considered in design is proportion—first, in respect to masses; and secondly, as to details. The best proportions to my mind are seen in the design with the motto "Modern Worship." "Crescendo" is more Gothic than Classic in relation of its height to the width. The dignified simplicity of the design by "Modern Worship" and the placing of certain decorative details are worthy of much praise. So is the composition of the screen and gallery for musicians, but his drawing is rather inferior to some of the others. The fine open space in front of the choir would make decidedly the best general plan shown, apart from the east end, which is, however, the subject named. Could a space large enough for the organ have been provided in one of the sides of the octagon facing down the church, I should say he would have made a very good suggestion indeed, or even if he had divided it (notwithstanding the report) and put half on either side of the choir in the alternate sides of the octagon, it would have been very good for antiphonal singing, and the sound would travel well into the church.

Indeed, this competition is most satisfactory as showing life and courage and industry in the rising generation of architects. This, in fact, applies equally to all the sets of drawings submitted; the thought and elaborate draughtsmanship evolved is amazing, and cannot be anything but beneficial to the art. But I think it would be well to consider the drawings and studies of some of the greatest masters of past days; some were shown in these rooms not long ago, and I have a recollection of seeing sketches for both pictures and architectural designs in the gallery over the Arno, between the Uffizi and Pitti Palaces at Florence. In these I could not help noticing how those masters of composition, whether for pictures or architecture, roughly, but fairly, drew out the masses of their designs, first weighing well the proportion and lights and shades, scarcely any detail being shown at all, or perhaps a sketch by itself of cap, column, entablature or pediment, showing clearly that in their eyes the details were matter of after consideration. A few lines and shadows carefully drawn showed the general study of the design, which was afterwards clothed with detail. Nowadays the excellence and facility of draughtsmanship attained appears to have the effect of causing more attention to be paid to detail than to the main architectural features, which are apparently drawn straight off without any such careful studies as those I have named; it also sometimes appears as if the general design were made for the sake of introducing certain details that would fit it; in fact, the very opposite method of working to that employed by the old masters, the first and grander idea of proportion being allowed to take care of itself. Of what use or value is a building if its plan does not answer the primary purpose? and again, of what use is detail, however beautiful it may be, if it does not embellish fine proportion? The old buildings we most admire are those in which proportion is perfect, or nearly so, whether it be the architecture of Greece, Rome, the Middle Ages, or the Renaissance; the detail is an extra though interesting incident, but grandeur or fine architecture in its truest sense can never be obtained by that alone.

Judging by some of the sketches and drawings I have examined, the draughtsmen apparently forget that the object of a student's drawing architecture and architectural detail is first to learn, and then to show the work clearly and the form of its details accurately, not to indicate in a showy way the general effect—this is all very well for a newspaper artist, but

for the architectural student it leads him into a wrong appreciation of the objects of architectural drawing. And here I cannot help remarking that I think a large amount of harm has been done of late years to architecture and architects generally by the amount of tricky and misleading pen-and-ink draughtsmanship which has become the fashion; the effects are in most cases absolutely untrue and unlike the buildings when erected, and this fact photography often reveals. For instance, red brick buildings with white stone dressings or other varieties of coloured materials are constantly made by means of illicit shadows and impossible broad lights, splashes, dots, broken lines and other dodges, to appear to the effect produced in the drawings, and most disappointing, often because no particular thought has been given to proportion and the disposition of the materials or masses of colour, or masses of shade, and depths of mouldings or reveals. In fact, the object in the class of work I refer to is not so much to represent faithfully an architectural design, but to make a showy drawing to impress the uninitiated, and in this the superficial and meretricious feeling of the age seems to be represented. The fairly thoughtful, well-coloured drawing of an earlier period was certainly less deceptive.

But so long as it is forgotten that drawing is only a medium by which architecture is studied or shown, and students and others vie with each other in simply turning out pretty drawings, so long will many of our modern buildings result in disappointment. The effect of detail as well as of general masses is what has to be learned, and this can only be done by careful dissection of old work, by measurements and accurately delineated drawings.

My friend, the late Mr. William Burges, said he was ashamed to think how many books he had filled with pretty sketches during his earlier travels, and at that point he would have stopped had not a critical friend asked him cynical questions as to why he did this drawing or that pretty sketch, and why he had not drawn the full-size curves or contour of that particular moulding, till at last he was obliged to confess that the sketches had been done for the vanity of making pretty pictures, and that they were absolutely useless. He then made up his mind to turn over a new leaf, and the result was that he obtained an entirely different collection of drawings from his former ornamental sketches, in the shape of rough but accurate and valuable documents. I would commend this fact to the thoughtful student for reflection.

Perfect drawing and facile draughtsmanship are most necessary to an architect, but do not let us exaggerate their importance and make an architectural god of drawing, which is, after all, merely the A.B.C. by which we express our intentions. I speak strongly on this point because one cannot help seeing the danger some of our young men are falling into of considering the drawing more than the truthful effect of the structure they portray. Do not misunderstand me. I do not wish to decry clever draughtsmanship, but only the fascinating tricks now in vogue. Every architect should be able to draw well, though it is well known that many men have turned out beautiful buildings who were no great draughtsmen, but whom, nevertheless, we shall find it very difficult to beat, notwithstanding that many young architects have already left them far behind in respect of drawing.

If a man cannot draw he cannot even suggest his designs properly or rightly correct his details, and this is a necessity; but it is a different thing from priding himself on doing every detail with his own hand. My old friend, Burges, used to say your head work is more important than your hand work, and do not waste too much of your time (that is, as a practising architect, not as a student) in the merely mechanical work which others, under your instruction and correction, can do just as well for you. In this I have not the slightest doubt he was right, from the highest architectural point of view; and if a late celebrated architect, to whom we owe one of our latest public buildings, had made fewer drawings with his own hand and given more time and thought to the arrangements of the architecture generally, the result would have been less disappointing, more useful and more artistic; nor need the detail itself have suffered in the least degree, with proper supervision, but quite the contrary.

Perfect drawing of good designs needs no adventitious aids or tricky artifices. The beautiful drawings of Mr. Heber Rimmer and Mr. Bedford, with the less perfect drawings of Mr. Kitsell, shown as the result of their travels, are a clear proof of this. Let your work tell the straightforward, honest, manly truth, for you may be certain that in the long run a truthful delineation of architecture and architectural subjects will help a student on the road to success much more safely and surely than pretty untruthful suggestions of effect which designs when executed fail to realise.

A vote of thanks to the President and Mr. Emerson, as proposed by Mr. John Slater, was passed by acclamation.

The President then distributed the prizes, the list of which was published last week, and the meeting terminated.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the last meeting of the Edinburgh Architectural Association, Mr. W. W. Robertson, president, in the chair, Professor Baldwin Brown read a paper on "Bronze Doors and their Artistic Treatment." He began with some general remarks upon the subject of design, as illustrated by the principal bronze doors of which art history took account, and in this connection laid special stress upon the importance of considering the characteristics of different materials and processes as a preliminary to design. He described and illustrated, by means of lantern transparencies, a number of famous bronze doors. A Classical bronze door he explained to be a copy in bronze of a panelled door in wood. Mediæval bronze doors, he showed, fell into three groups—firstly, those found in Saxony; secondly, those found in Southern Italy; and thirdly, those met with in Tuscany. The first two groups belonged to the eleventh and twelfth centuries, whilst the third group belonged to the centuries from the thirteenth till the sixteenth. Views of characteristic examples of all three groups were afterwards thrown upon the screen, and their salient features pointed out. Professor Baldwin Brown was thanked for his paper.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT the meeting of the Glasgow Architectural Association Mr. H. C. Shelley read a paper on "Some Scottish Castles." Mr. Campbell Douglas, the president, occupied the chair. Mr. Shelley dealt with about twenty of the castellated structures, situated chiefly in the western district of Scotland, which illustrated the various styles of structure which had prevailed since the twelfth century. He said that the study of ancient castles was very interesting. The present so persistently claimed attention that people were in constant danger of forgetting that past in which it had its roots, and the loss in so doing was by no means insignificant. Those students of antiquity who did not allow their interest in the past to blind them to the claims of the present were continually emphasising the continuity of all life and protesting against the habit into which some scholars had fallen of dealing only with phases of life. It was a protest which could not be too often repeated. There were many ways by which they might preserve their historical continuity, but hardly any method was likely to yield such splendid results as purposeful visits to those ancient castles, which remained sole witnesses of an age which had passed away.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

THE general meeting of this Society was held at the School of Art on January 10, when Mr. J. B. Mitchell-Withers, jun., A.R.I.B.A., read a clever technical paper on "Architectural Illustration by Means of Photography." Mr. Innocent presided, and there was a large number of the members present. The lecturer gave an exhaustive description of the various processes through which photography had been, especially during the past five years, brought to perfection for illustrative purposes, and his paper was made further interesting by a number of fine photographs and photo-prints hung round the room, which were closely examined by the members. A discussion took place, in which the President, Messrs. F. Fowler, C. Hadfield, E. M. Gibbs and H. L. Paterson took part, and a hearty vote of thanks was awarded to the lecturer for his instructive paper.

THE FUTURE OF EGYPTOLOGY.

ON Saturday last Mr. W. M. Flinders Petrie, the first holder of the professorship at University College, founded by the munificence of the late Miss Amelia Edwards, delivered his introductory lecture. He said that in Germany, France and Italy facilities had long been provided for students of Egyptology by their Governments, while the English Government, although it had occupied the country for ten years, had done nothing, and even private enterprise had been hindered rather than helped by English diplomacy. The only public teaching in the subject had been in the languages of Egypt and Assyria, started many years ago, but no other department had been touched. No encouragement had been given to the study of Egyptian history. It should be remembered that every fragment of the products of the past was concrete history. Everything was a document to the archæologist. Yet the only collections made had either been rigorously preserved from close handling or were inaccessible in private hands, and there had been no centre of information and union for students at work. At last provision had been made, but at the price of a great loss, Miss Edwards, whose devotion to the subject, untiring

energy and noble nature were known to all students of Egyptology, had for the first time made a permanent provision. Another heavy loss had been sustained in the death of Mr. Chester, who had laboured for years to spread the knowledge of Egyptian antiquities. Mr. Petrie said, as professor, his aim would be to provide for the wants both of those who needed a complete library for exhaustive study and for those who could only spare occasional hours at home. During a portion of the year the books in the library would be lent out under adequate safeguards. There would also be a collection of over 1,000 photographs to show the gradations of Egyptian art and style, and also an abundant supply of those paper impressions or "squeezes" of sculpture which were so invaluable for study. There would, too, be a collection of original objects for the close examination of students. Miss Edwards had formed a collection with much care—as complete and typical as possible. He hoped, also, to place on loan his own collection, and to have a series of annual loan exhibitions drawn from the many valuable private collections in England. There would thus be found a collection of deities, the most complete collection of scarabs, the only chronological collection of beads, a dated series of pottery, the largest collection of funeral cones, and also of Egyptian weights. In certain lines of study their museum would not be merely supplemental, but would be in advance of any historical museums. The Professor then sketched out the work which he proposed for himself and the students who should attend his lectures. He would give a series of lectures in the autumn and spring, and would prepare students who might wish to undertake practical work in Egypt, where he would spend the time from Christmas to Easter. If students provided ability and time it ought to be for others to find the money. From his own experience he could safely say that from 300*l.* to 400*l.* would provide the costs of travelling, living, excavating and transport of collections for one excavator for a season. As he had before said, it was the whole history and geography of Egypt, as well as the language, which were comprehended under the term Egyptology. Brugsch Pasha's priceless volume, "*Ægyptologie*," revealed how wide a field was covered. For the political history, besides Brugsch, there were Wiedemann and Meyer, as well as compilations such as the "*Egypt of the Past*," in which Miss Edwards had a large share and Rawlinson's later work. But these needed large revision. In religious history there were the publications of the *Musée Quinet*. In law Revillout had published most, but on the documents of later times. But, for the general outlines of the whole subject, all had borrowed from Wilkinson, but none had surpassed him. The art of Egypt needed much more systematic study than it had yet received. The extant materials must be the main guide for distinguishing the successive schools, periods and localities. Careful detailed work was also needed on the architecture, whose prehistoric forms might be seen fossilised in the hieroglyphs drawn from the various forms then used. The geography, the principles of name-giving, the titles of office, all required further elucidation, whilst the history of hieroglyphs was a subject "still to let." Careful research might disclose much more than we now know about the presence of foreign races in Egypt. And its connection with other nations made the chronology of Egypt of world-wide importance. Greatly as estimates had varied, we now knew that the variation is confined within tolerably definite limits. From continuous astronomical statements we were warranted in believing that as far back as the sixteenth century B.C. we were on solid ground. In the practical department there was much need of trained hands for excavation and exploration. There was no greater mistake than to suppose that a scholar must be an excavator, as totally different qualities were required by the two. The *corpus* of materials at our disposal still required a systematic reduction to historical order. Of pottery there was almost a complete series throughout the whole of Egyptian history. No comparative series, however, of funereal figures or *ushabtis* had been published. The scarabs with personal names of kings and officials had been partially published, and the exact dating of the history of beads would be of great value. On glass and glazes Mr. Henry Wallis had done much, but a great deal remained to discover. The subject of metallurgy and chemistry had only been touched by, at most, twenty analyses, and Dr. Gladstone had given some very interesting results of recent work. Research was still required into the use of tools and weapons, and a complete *corpus* of drawings or photographs of all dated coffins was much needed. Amulets, toilet objects, jewellery, weights and measures were all subjects on which further investigation might fruitfully be expended. His ultimate hope was to see drawn together a solid body of workers, each contributing some permanent advance to knowledge. It had been the glory of England that the free worker had frequently rivalled the specialist. Murchison, Spottiswoode, Huggins, De La Rue, Evans, Lubbock, Sir William Grove were household names, and yet all this work was done outside of the course of life which most men would consider full enough without a scientific reputation. Might we not see arise a Murchison or an Evans of Egyptology?

THE DRAINAGE OF RICHMOND, SURREY.

ON Saturday the action commenced by the late Mr. Charles Dickinson against the Richmond Main Sewerage Board was decided before Mr. Justice Wills, who had the aid of Sir Douglas Fox, C.E., as assessor. It was to cover cost of work and labour done and material provided and money expended in the construction of the Richmond Main Drainage Works, also for damages for breach of contract. The hearing of the case took place in June last, when judgment was reserved. The late plaintiff on August 4, 1888, contracted with the defendants to construct certain sewers in the parishes of Richmond, Kew and Mortlake, for the sum of 40,666*l.*, according to specifications annexed to the agreement. It was provided that the sewers were to be constructed according to the orders and directions of the defendants' engineer, and completed in eighteen months. On August 28, 1888, the defendants' engineer gave the plaintiff notice to commence the works, which he accordingly did. On September 28 the defendants' engineer ordered the line of sewers on the drawing to be altered, the altered line going through private property belonging to Mr. Poupart. The plaintiff's case was that, although he repeatedly asked the defendants and their engineer to procure for him liberty to enter upon Mr. Poupart's land, he was stopped by Mr. Poupart and prevented from proceeding with the altered works. It was further alleged that it was agreed that between Gipsy Corner and manhole 97 the plaintiff should proceed by open trench work instead of tunnel work, that additional land was necessary for such work on either side of the proposed line of sewer, that the defendants neglected to procure him possession of such land, and he was prevented from completing the said line of sewers. On November 14, 1889, the defendants informed the plaintiff that they had given their engineer instructions to make arrangements for the construction of the works by another contractor. By the contract deed the defendants had power to determine the contracts in the event of the plaintiff failing to exercise due diligence in carrying out the works. Plaintiff alleged that, owing to the action of the defendants, he was prevented from completing the contracts, and that therefore he was entitled to damages amounting to a very large sum.

The defendants, in defence, denied that they had acted unreasonably. They submitted that the plaintiff wrongfully abandoned the works, which they had been compelled to complete, and counterclaimed for damages.

Mr. Justice Wills, in his judgment, said that with regard to any part of the new sewer alluded to in the first contract which the plaintiff did not execute he was entirely in the wrong. He was quite satisfied that if plaintiff abandoned the works he did so on no ground for which the defendants were responsible, and that if the defendants took them away from the plaintiff they were justified in so doing. With regard to the second contract, the plaintiff had no intention of performing it, and raised every kind of difficulty for the purpose of getting out of it. In his opinion the defendants' engineer was disposed to be very fair, and even liberal, to the contractor. With regard to the sewer under Mr. Poupart's land, the engineer was within his rights in ordering it to be tunnelled, and Mr. Poupart's consent was not necessary, because the plaintiff could have proceeded by giving a notice under the Public Health Act. He was of opinion that the plaintiff had no intention of performing that part of the contract. He pronounced judgment in favour of the defendants, but would reserve all further questions until the rest of the case—the question of damages—had been disposed of. Sir D. Fox had read his (the learned judge's) judgment, and concurred in the views expressed therein.

Mr. Houghton, for the defendants, remarked that, as Mr. Dickinson had died since the action was brought, the defendants might come to the conclusion that an end ought to be put to the litigation.

SCHOOL BUILDINGS.

Wilton.—About a dozen competitors sent in architectural plans and designs for the proposed new Church schools, in response to an advertisement in the *Northwich Chronicle* and other papers. These designs were submitted to Mr. Douglas, architect, of Chester, as assessor, who found that all of them would exceed in cost the amount named, 2,500*l.* He, however, selected three designs, under the signatures of "Pro Ecclesia," "Cheshire" and "Economy," which he recommended as approaching the nearest to the desired conditions. We understand that the committee have selected as their choice the design of "Pro Ecclesia" (Mr. M. K. Ellerton, architect, of High Street, Northwich). This design Mr. Douglas described as being "most carefully thought out." Mr. Ellerton may be congratulated upon his success. His design is most in accord with the architecture of the church, and is certainly as effective as it possibly could be within the limits assigned. Mr. Ellerton,

it will be remembered, was the architect of the Brunner Free Library, Northwich, the Gladstone Club, Northwich, and Marston Schools. The various designs, including those accepted, "Pro Ecclesia," "X.," "X. Y. Z.," "Adaptability," "Effort," "Economy," "Light and Air," "Ecclesiasticus," "Education," "Cheshire," &c., have been placed in the Salt Museum for public inspection. Probably some modifications will have to be made in the accepted design to meet the difficulty of expense, but taking it as a whole, and judging by the design exhibited, we believe the new school will be a handsome addition to the architectural attractions of Northwich. The site selected is in Church Walk, close to the gates of the parish church. Mr. Ellerton, the architect, in his particulars states:—"Having made a careful survey of the site, I can only appreciate the wisdom of erecting a building that will harmonise as far as possible with your fine old parish church. This, in regard to the external appearance, I have placed foremost in my conception of the design, while avoiding any sacrifice in the utility of the arrangement of the plan, and I have given my careful consideration to the construction of the work. I have kept the separate parts of this building within the limit of height required according to their disposition, so as to come more nearly within the sum stated to be at disposal for its erection. I have not carried up the front of my building higher than the classrooms, nor extended the area of the central hall above their level, this, in my opinion, being unnecessary, as an upper floor is not required, while it admits of better light and ventilation at the ends of the central hall." Further on Mr. Ellerton very candidly states that, if carried out in full, his design would cost more than 3,000*l.*, but that with modifications of the design it may approach the cost of 2,500*l.* The building contract is not yet allotted.

GENERAL.

Professor Aitchison, A.R.A., will commence his course of lectures at the Royal Academy on Monday next.

M. Vauthier, the French sculptor, died in Paris on Tuesday, in his sixty-first year.

The Arts Committee of the Liverpool Corporation have decided to hold a spring exhibition of pictures in the Walker Art Gallery.

The Agent-General for South Australia has purchased *Circe Invidiosa*, by Mr. Waterhouse, A.R.A., and *A light of laughing flowers along the grass is spread*, by Mr. Ridley Corbet, for the Adelaide Art Gallery.

The Painting by Albert Dürer of the enthroned Virgin and Child, which was purchased at a costly price, has been hung in the Berlin Gallery. It was produced during his residence in Italy, and for once he ceased to employ a hard style. It is inscribed "Albert Dürer german. faciebat post virginis partum, 1506."

Sixty Designs have been submitted for the new Government buildings which are to be erected in Victoria, Canada, out of which five will be selected as the basis of a second competition.

Mr. H. E. Stannus will on Tuesday, the 24th, read a paper at the Society of Arts, in the Applied Art Section, on "The Theory of 'Storiation' in Art."

Professor Mackay, Liverpool University College, read a paper on "The Teaching of Architecture in the new University" at the meeting of the Liverpool Architectural Society on Monday.

Mr. J. P. Jones has taken into partnership Mr. Sydenham W. Richards (late of Richards & Gethin, architects). The offices of the new firm of Messrs. J. P. Jones, Richards & Budgeon are in St. Mary Street, Cardiff.

A Communion-table of dark polished oak is being executed for Rubislaw parish church, from the designs of Mr. A. Mackenzie (Mathews & Mackenzie), of Aberdeen.

The "Lincoln Chronicle" says:—"The scheme for filling the vacant niches in the canopies of the choir stalls at the Minster with oaken statuettes, representing the saints of the Anglican Calendar, is fast approaching completion. Of the sixty-four statuettes needed fifty-eight have been already given, leaving only six to make up the entire number."

Mr. John Taylor, A.R.I.B.A., architect, of Longton, Staffs, has taken into partnership his late manager, Mr. Harry Burgess, and the firm will in future be styled Taylor & Burgess.

The Surveyors' Institution meets on Monday, the 23rd, when a discussion will take place on the papers—by Mr. P. D. Tuckett, entitled "A Short Explanation of the Proposed Bimetallism as affecting British Interests," and by Mr. A. Goddard, entitled "The Currency Question and Land"—read at the last meeting.

A Block at the Military Hospital, Devonport, was destroyed by fire on Tuesday, and will require reconstruction.

On Wednesday, the 25th inst., Mr. Wyke Bayliss, F.S.A., read a paper at the meeting of the Society of Arts, entitled, "The Fine Arts in relation to the Sanitary Condition of our Great Cities."

The Architect.

THE WEEK.

THE London County Council received one hundred and fifty-six applications for the appointment of manager of works and stores. Six of the candidates were selected by the committee, and then the number was reduced to three, viz. Mr. J. HOLLOWAY, Mr. G. T. EARLE and Mr. A. ROBERTSON. The appointment of Mr. HOLLOWAY was recommended. It was approved by the Council. The salary is to be 700*l.* a year, and the conditions are as follows:—"That he do hold his office during the pleasure of the Council; that he be required to give his whole time to the duties of his office, and be not allowed to take any private business; that any fees received by him either as a witness or in any other capacity be paid to the Council; and, further, that on retirement he shall not make any claim to any retiring allowance under the Superannuation Act, 1866; and that he will submit to any general scheme which the Council may adopt with respect to insurance for pensions or superannuation."

THE proceedings in the police offices and the infliction of fines have compelled the London School Board to become more anxious about the sanitary conditions of the schools. On Monday last the Works Committee decided that the following general instructions drawn up by the assistant architect should be sent to the clerks of works, to guide them in making their reports, so that all may work upon the same lines:—1. The main school drain to be disconnected from the sewer by a properly constructed man-hole having a channel floor, an interceptor on the sewer side, an air-tight iron cover and frame, and a fresh-air inlet shaft. 2. An up-cast ventilating shaft should be at the head of the main drains. 3. All soil-pipes should be ventilated and should be placed on the outside of the building. 4. All lavatory wastes should have traps and discharge over open gullies outside the building. In addition to this the wastes on the upper floors should discharge into open hopper heads on the outside of the building, or they should, if close to windows, be carried up and ventilated. 5. All rain-water down pipes should be disconnected from the drains and fitted with shoes and open gullies. The drains from the rain-water pipes inside a building should be made to discharge into a gully in the open air. The foot of stackpipes inside a building should be made accessible by means of a small iron cover and frame. 6. The drains, traps and connections should be tested with smoke, and bad joints and defects which show themselves must be made good. 7. State whether the offices are fitted with iron troughs and whether they are flushed by automatic tanks or by a hand lever; state the condition of the troughs, and whether the seats are movable so as to enable the trough to be properly cleansed by the schoolkeeper. A considerable number of the schools are now up to these requirements, and when the remainder are placed in a similar condition the clerks of works are once a year to examine and test the whole sanitary system at each school, and send in reports upon the subject.

IT is not uncommon in Mediaeval sculpture to find figures of two angels holding thuribles and incensing the Blessed Virgin and Child, who are standing or seated between them. But the subject is rare among seals. Archbishop EYRE, who is a thorough student, said at a meeting of the Glasgow Archæological Society that, after considering the descriptions of 2,608 seals, he found only five in which there was a representation of the Divine Infant in His Mother's arms, with angels waving thuribles. They were the burgh seal of Dundee, a Dunkeld bishop's seal, and two Kelso seals. The Archbishop exhibited a photograph of the seal and counter-seal of Rutherglen, which have a relation to the Kelso seals, for the emblems are—first, the Divine Child in the arms of the Blessed Virgin, who was seated; second, two angels waving the thurible or censer; and third, a ship or a galley with sails furled. The explanation of the three emblems on the Rutherglen seal would seem to be:—1. The Blessed Virgin was represented

because the ancient church of the burgh was dedicated to her. 2. In her arms was the infant Saviour, whom the two angels were worshipping by offering and burning incense in thuribles. 3. The ship or galley was also represented, because from an early date Rutherglen was the chief trading town and shipping port in the lower part of the Clyde. The seal had only the galley with the legend, "*Sigillum communitatis de Ruglenensi.*" The counter-seal had the Virgin and Child with the angels, but without the galley. Its legend was a leonine verse, and runs thus:—"Signant ista tria rata navis nauta Maria," *i.e.*, "These three approved things form the seals, the ship, the sailor and MARY." From this legend it could be gathered that the seal and counter-seal were looked on as one seal, because the galley was not on the counter-seal. Also it seemed clear that somewhat later than A.D. 1493 the seal was no longer used as a pendant seal, but that the seal and counter-seal were re-made in the form now before them by adding all the emblems in one seal, by omitting the legend "*Signant ista tria,*" &c., and changing the other legend into "*Sigillum Burghi de Rutherglen.*" The Archbishop's description of the seal has interest for others besides specialists, for it is a warning to many who employ Mediaeval subjects as signs and ornaments. It appears that when the new burgh hall of Rutherglen was erected thirty years ago an adaptation of the seal was carved on the walls. It represented the Divine Infant in the arms of His Mother, not seated but standing, a small galley on the water, and on each side a figure, meant for a bishop, holding a thistle. No motive seemed to have been assigned in explanation of the action of the authorities of Rutherglen in carving upon their town hall this bastard shield, in which two figures with thistles were substituted for the angels with censers. For the old legend was substituted a Latin rendering of a local saying, "*Let Ru'glen's lums reek briskly.*" The authorities, like good easy men, have no doubt felt proud of their ancient symbol, which after all is only a practical joke by a native humourist.

ATTEMPTS to mulct peers and trustees in additional legacy duty are supposed to be signs of a watchful Government. They are rarely successful. In theory it may be right to assess every accidental advantage which may arise to new possessors of property. But, on the other hand, allowance should be made in cases where, from the value of property becoming diminished, legacy duty was paid in excess. Where is the Chancellor of the Exchequer who would be magnanimous enough to return duty under the latter circumstances? In London the Courts were occupied recently by a case where an increase of duty was sought on account of a rise in the value of paintings. In Edinburgh a case is now being tried which has greater interest for artists. The late PATRICK ALLAN-FRAZER, who died on September 17, 1890, bequeathed his whole estate to trustees to be devoted for the benefit of art. The interest was to be employed for the assistance and encouragement of young men not having sufficient means of their own, who should be desirous of following out one or more of the professions of painting, sculpture, carving in wood, architecture and engraving; and to provide for the comfortable maintenance and support of aged or infirm professional men, being painters, sculptors, and literary men, and those who from physical defects were incapable of supporting themselves in comfortable circumstances. Directions were given in the will for the maintenance and education of thirty art students at the testator's house at Hospitalfield. It was also stated that the aged or infirm persons to be benefited should consist of four painters, three sculptors, and three literary men. A sum of 50*l.* was appointed to be paid annually to each of them during their lifetime, or so long as the trustees should think proper. There were also special bequests to institutions in Arbroath. The value of the testator's estate in Forfarshire was declared to be 60,371*l.* 1*s.* 7*d.* The trustees paid succession duty on it at 10 per cent., which used to be the highest rate. The duty amounted to 6,037*l.* 2*s.* 2*d.* But by an Act of 1888 it was ordered that the duty on the property of persons who died after July 1, 1888, was in the case of a stranger in blood to be increased from 10 to 11½ per cent. Accordingly an additional sum of 1,000*l.* has been claimed by the Government. The defence of the trustees is that the additional duty does not arise in cases like theirs.

CHURCH BUILDING IN ENGLAND.

IT would be presumptuous to assert that England is the most religious country on the earth, but there is no doubt that more money is expended among us on account of religion than elsewhere. The Parliamentary return which has just been issued is evidence of the generosity with which one class of good works is supported, that is, the building of the churches. It supplies information respecting "the number of churches (including cathedrals) in every diocese in England which have been built or restored since the year 1873." The return is, therefore, supplemental to one which appeared in 1876, and which gave the expenditure from 1840 to 1873, under similar conditions on all churches except those in the dioceses of Peterborough and Gloucester and Bristol.

The selection of the year 1840 as a starting-point for the preparation of the returns was probably determined by the difficulty of obtaining exact information relating to an earlier time. But it is to be regretted that an effort was not made to show the progress since 1818. In that year not only was the Incorporated Church Building Society founded, but an Act was passed which removed many of the obstacles which prevented the erection of churches. It used to be a costly process to obtain the authorisation for getting up a church or chapel of ease; in a case at Derby the amount expended on preliminaries is said to have been 1,000*l.* After 1818 the effect of the new arrangements was seen in the encouragement of building. While in the period from 1811 to 1820 only ninety-six churches were erected in England, between 1821 and 1830 the number was increased to 308, and there were 600 built between 1831 and 1840.

The Parliamentary return of the period between 1840 and 1873 was incomplete, and the information was not given with any uniformity. In some cases there was hesitation about recording the expenditure. But it was ascertained that 24,291,719*l.* 13*s.* 7½*d.* had been laid out on church fabrics between 1840 and 1873, and it was likely that with a better system of account-keeping a much larger sum would represent the payments. Two dioceses, as we have said, were excluded, and the cost of the works at Westminster Abbey was given.

The last return is far more complete, and is arranged in a clearer manner. The subjoined summary reveals that in less than twenty years the expenditure on the building and restoration of churches in England has amounted to 20,531,402*l.* 18*s.* 9½*d.* It may, therefore, be assumed that in about half a century the Established Church has paid on account of building not less than forty-five millions in hard cash.

There are no signs that the demand for new churches has ceased, and it is not impossible that twenty years hence the next Parliamentary return about churches will appear as remarkable and as creditable as those which were obtained by the late Lord HAMPTON and the Duke of WESTMINSTER. If the cost of the churches erected by other bodies of Christians are considered, the result will justify what we have said about the position which England holds as a supporter of Christianity.

According to the last return, London has the credit of the largest expenditure, viz. 2,009,307*l.*; but in proportion to population and area Manchester, with its 1,579,445*l.*, can be said to have exhibited greater generosity. A large part of the 752,480*l.* which appears for Rochester, and some of the outlay in St. Albans, should, however, be credited to London.

The returns of the London diocese have some peculiarities. In several of the divisions the whole of the money obtained was used for restorations. East and West City, St. Margaret and St. John (Westminster), St. Marylebone, St. Martin-in-the-Fields and Uxbridge cannot point to new buildings as proofs of the generosity of the inhabitants. In other places the expenditure on new buildings is amazing. Hammersmith is not a wealthy district, but the rebuilding of St. Paul's has cost 25,026*l.*, St. Thomas's Church cost 4,656*l.*, Holy Innocents 7,000*l.*, St. Saviour's 3,878*l.*, St. Simon's 11,000*l.*, St. Mary's 7,000*l.* Nearly all the money was obtained from local contributions. Fulham is still poorer, yet new churches have cost 28,211*l.*, in addition to 11,900*l.* for restoration. Kensington has gained reputation for liberality in supporting church work. The

new churches have cost 146,137*l.* St. Mary Abbots is put down at 31,000*l.*, but so extensive a building must have cost a larger sum. St. Augustine's cost 20,000*l.*, St. Cuthbert's 17,000*l.*, St. John Baptist's 23,140*l.*, St. Helen's 10,000*l.* For restoration 21,503*l.* was paid. In Chelsea the rebuilding of Holy Trinity Church cost 35,000*l.* The Goldsmiths' Company paid 13,000*l.*, the cost of erecting St. Dunstan's, East Acton. Mr. NORMAN SHAW's church in Bedford Park cost 9,000*l.* The expense of restoration at Chiswick Church by Mr. PEARSON was 22,662*l.*, towards which the late H. SMITH contributed 19,912*l.* The family of Mr. F. OUVRY paid 3,000*l.* to rebuild the tower of St. Mary, Acton. Alderman SYDNEY erected St. Gabriel's, Bowes Park, costing 6,500*l.* Mr. P. TWELLS not only erected St. Mary Magdalene, Enfield, at a cost of 14,896*l.*, but gave 10,000*l.* for endowing it, and Mr. H. S. MILES paid 10,480*l.* for All Saints, Friern Barnet. At Teddington, St. Alban's cost 30,000*l.*, and St. Stephen's, Twickenham, 15,054*l.* In St. George's, Hanover Square, a large sum was expended on restoration, viz. St. Mark's, North Audley Street, 11,000*l.*; St. Michael's, Chester Square, 9,000*l.*; St. Peter's, Eaton Square, 15,800*l.*; St. Gabriel's, Warwick Square, 4,000*l.* The new buildings are St. Mary's, Bourdon Street, 12,233*l.*; St. Philip's, 10,000*l.*; St. Mary's, Graham Street, 4,000*l.*; St. John's, Wilton Road, 15,000*l.* In the Harrow deanery the most expensive church is St. Andrew's, Willesden, which cost 8,500*l.* St. Mary's, Hornsey, cost 17,183*l.* St. James's, Hampstead, 10,000*l.*; while the restoration of St. John's parish church, Hampstead, entailed an outlay of 12,822*l.* The cost of Holy Trinity, Stroud Green, was 12,500*l.*, and of St. John, Hornsey, 11,386*l.* That fine building, St. Augustine's, Kilburn, cost 35,377*l.*, towards which the congregation gave 34,527*l.*; and the 30,000*l.* required for St. Matthew's, Bayswater, came entirely from the congregation. In the East of London so many new churches could not be erected without much self-denial on the part of the people. St. Paul's, Glyn Road, Hackney (11,300*l.*), and Holy Trinity, Dalston (7,500*l.*), were no doubt built out of the proceeds of the sale of two City churches, and there were a few donors of large sums, but in general the money was derived from congregations. St. Mark's, Dalston, cost 16,025*l.*; St. Bartholomew's, 14,300*l.*; All Saints, Stoke Newington, 13,990*l.*, and St. Andrew's, 13,500*l.*

In the eighteen years from the beginning of 1874 to the end of 1891 the outlay on St. Paul's Cathedral for maintenance, decoration and restoration has amounted to 125,957*l.*, which was made up of 64,164*l.* from ecclesiastical funds and 61,793*l.* in voluntary contributions. The heaviest expenditure was 15,873*l.* in 1886, and the lowest was 3,653*l.* in 1877. Canterbury Cathedral called for an expenditure of 35,127*l.* At Winchester 9,586*l.* was laid out mainly in the restoration of screens. Restorations at Bangor amounted to 10,104*l.* On the west front of St. Andrew, Wells, 13,196*l.* was expended, besides 660*l.* for bells. The repair of the campanile and a new clock at Chichester cost 3,193*l.*, a lightning-conductor 638*l.*, a choir-screen 937*l.*, and the restoration of the cloisters 2,099*l.* The sum expended on the cathedral of Ely was 7,050*l.* Besides the annual normal expenditure on the fabric of Exeter Cathedral since 1873 exceptional works amounted to 39,223*l.* Since 1876 19,972*l.* has been laid out at Gloucester. Between 1866 and 1876 the citizens subscribed 40,000*l.* towards the restoration of the nave. Hereford Cathedral needed no more outlay than 1,692*l.* At Lichfield the restoration of the west front and north and south towers and spire amounted to 45,550*l.* At Lincoln the expenditure was 37,434*l.* Llandaff cost 3,424*l.* The remainder of the restoration fund, or 2,013*l.*, was all the disbursement that was necessary at Christ Church, Oxford. A large amount of work was executed at Peterborough, and the details fill a whole page of the return; but to the end of 1892 the outlay was not more than 44,609*l.* As the fees of the late Sir G. S. SCOTT and Mr. PEARSON amount to 1,730*l.* it is evident that commission was not charged on many of the items. The restoration of Rochester Cathedral was in hands between 1871 and 1877, and cost 23,000*l.* On the works of the west front the outlay has been 2,065*l.* The costliest restoration has been St. Albans, which already has amounted to 160,000*l.* Up to 1880 the subscriptions were 40,000*l.* Since then the work has been carried out at the sole expense

of Lord GRIMTHORPE. At St. David's the restoration was commenced in 1864, and continued to 1892, when the expenditure was 43,452*l*. Works (including stained-glass, which cost 6,563*l*.) were completed in Salisbury Cathedral, and cost 49,548*l*. At Southwell Minster the outlay was 20,826*l*. The cost of the new cathedral of Truro is entered as 113,684*l*., which was derived from voluntary subscriptions, church collections and legacies. Worcester Cathedral is another of the sound buildings; for one year only 6*l*. 1*s*. 4*d*. was laid out on the fabric, and the total cost of conserving it during seventeen years was 1,926*l*. The sums laid out yearly for the maintenance of York Minster between 1874 and 1891 come to 33,010*l*. In addition the south transept was restored within and without at a cost of 41,319*l*. For the restoration of St. Cuthbert's window 819*l*. was paid, and releading the nave roof cost 1,778*l*. The restoration of Durham Cathedral from 1873 to 1889 amounted to 38,414*l*. Carlisle was so recently restored the expenditure has been on the following extra works, viz. a throne, 525*l*.; a reredos, 1,790*l*.; a font, 739*l*. It is supposed that the restoration of Chester Cathedral since 1873 has cost 84,056*l*.; the late Dean considered the amount was over 100,000*l*. Liverpool is without a cathedral. Manchester expended 48,334*l*. on restoration. Upon Newcastle Cathedral 33,738*l*. was laid out. Since 1873 the total expenditure on Ripon Cathedral has not reached 500*l*. The cathedral of the new diocese of Wakefield has been restored at a cost of 28,882*l*.

We have added to the official summary an abstract of the expenditure in the preceding period:—

Diocese.	From 1873 to 1892.						From 1340 to 1872.
	Churches Built at Cost of			Churches Restored at Cost of			
	£	s.	d.	£	s.	d.	£
Canterbury . . .	209,582	0	0	497,557	0	0	917,399
London . . .	1,188,977	18	1½	820,329	2	0	2,270,816
Winchester . . .	539,107	8	9	326,955	11	8½	2,042,873
Bangor . . .	89,464	14	2	54,062	10	6	161,312
Bath and Wells . . .	79,214	15	10	289,061	15	9	728,349
Chichester . . .	384,499	2	4	290,418	7	4	746,389
Ely . . .	117,444	7	11	352,204	7	10½	884,941
Exeter . . .	172,498	18	6	416,362	15	3	782,305
Gloucester and Bristol . . .	290,752	12	11	330,019	2	11	—
Hereford . . .	46,322	6	0	226,683	1	8	443,641
Lichfield . . .	289,181	18	4	469,883	3	6	1,177,584
Lincoln . . .	163,596	4	11	309,851	9	3	1,009,197
Llandaff . . .	226,276	8	0	109,073	15	11½	368,482
Norwich . . .	42,061	0	0	513,692	11	8	666,338
Oxford . . .	158,256	0	6	394,016	7	6½	1,305,357
Peterborough . . .	155,583	15	7	475,974	13	8	—
Rochester . . .	752,480	2	7	326,803	9	11½	1,413,924
St. Albans . . .	325,982	4	11	568,362	0	11	—
St. Asaph . . .	130,822	17	1	102,386	7	2	408,371
St. David's . . .	192,900	1	0½	222,490	5	2½	374,453
Salisbury . . .	104,393	14	4	309,736	14	0½	879,426
Southwell . . .	263,443	18	0½	270,653	6	10½	—
Truro . . .	172,070	2	9	159,556	2	5½	—
Worcester . . .	294,885	2	10	490,127	8	7	1,127,000
York . . .	391,987	19	5	489,511	1	0	1,291,335
Durham . . .	294,842	8	7	175,274	11	11½	687,109
Carlisle . . .	139,803	14	7	169,507	4	4	391,497
Chester . . .	226,101	0	0	360,288	0	0	1,219,320
Liverpool . . .	426,064	13	7	137,705	11	5	—
Manchester . . .	1,157,737	1	4	421,708	3	1	1,513,446
Ripon . . .	375,138	1	11	175,265	2	11	954,622
Wakefield . . .	184,401	6	7	264,566	4	1	—
Sodor and Man . . .	21,909	0	0	4,363	0	0	26,220
Restoration of St. George's Chapel, Windsor . . .	—	—	—	5,304	14	2	—
Restoration of vault of the nave . . .	—	—	—	1,834	3	6	—
Maintenance, repair, and restoration of fabric of Westminster Abbey & cloisters . . .	—	—	—	78,058	10	0	—
Totals . . .	9,607,783	1	5½	10,609,627	18	1½	24,291,719
Diocese of Newcastle : Amounts expended on building and on restorations respectively, not specified . . .	—	—	—	313,991	19	3	—
Grand total . . .	£20,531,402	18	9¾	—	—	—	—

THE "QUARTERLY" ON ARCHITECTURE.

ABOUT twenty years ago a writer in the *Quarterly Review* demonstrated that the hope of English architecture was to be found in the working-man (carpenters, bricklayers, plumbers, slaters and smiths, were alike eligible), and that the most promising structure of the age was a club somewhere in Westminster, which was erected without any help from an architect. Persuasive as was the article, it was ineffective. People who were about to erect buildings did not go in search of the legitimate successors of the Greek and Roman builders that were to be discovered without difficulty in the lanes and alleys of London. Their indifference to the future of architecture was, however, excusable. The writer of the article by some oversight omitted to explain two considerations that have importance for every one who contemplates building. It may be he was too occupied with the thoughts of a new revival of art, or, like so many reformers, was oblivious of all things financial. Whatever was the cause, he did not make it clear that when the British workman had the disposal of clients' cash, buildings would be produced more economically than at present. Unfortunately the world is too sordid to risk money for the encouragement of experiments in that art which is the most incomprehensible to outsiders. The writer also neglected to show how by the use of primitive methods of organisation and appliances, and with architects who were to be occupied as workmen, buildings could be completed with increased expedition. Nowadays every contractor has penalties hanging over him if he exceeds a specified term before giving up a building to the owner and in a fit state for occupation. It was not clear how under the proposed conditions of carrying out works delays would be obviated. As the article was defective, inasmuch as the writer did not venture to grapple with the subjects that have most interest for people who have to pay for buildings, it is no wonder that not one conversion from old ways was accomplished by the writer. He would have been as successful if he had treated of dolls' houses and addressed himself to dolls.

Harder to bear has been the indifference of his pets. The English working-man was not inspired by the article to display any readiness to assume novel responsibilities. His ambition is of a very simple sort. He desires to make as much money as possible with the least mental exertion. What does he care about the ardour of Mediæval builders? He has heard that in those old days men like himself were not much better than serfs, and he must pity, if he does not despise, the weakness which could find consolation for daily misery in producing beautiful work at the command of a monkish taskmaster. An English worker is of a sceptical turn, and naturally doubts the motives of the benevolent schemers who are so eager to see him in an exalted position and controlling instead of being controlled. They may think only of the benefit to the arts; he shrewdly concludes that their proposals are only a dodge to get more work out of him. The carpenters, bricklayers and other operatives were therefore as deaf to the appeals of the writer in the *Quarterly Review* as lay and ecclesiastical clients. If an occasional workman is ambitious enough to attend drawing-classes in the evenings, he does not take the reviewer's conclusions to heart; all his efforts have one object, which is the possibility of setting up as an architect, and he will be only too glad to aid in perpetuating a system which repeatedly has been declared to be destructive of architecture.

After twenty years of neglect by all classes, the reviewer, for we presume he is the author of the article on "Architecture" in the last number, has had the gratification to find one incident which appears hopeful. If he exaggerates its importance, who can blame him? All his visions of the future of architecture have been renewed at the appearance of the volume of essays called "Architecture: a Profession or an Art?" The writers also seek a reform, but we doubt if they have been inspired by the reviewer, or would care to adopt his conclusions. Out of the thirteen essays there are only one or two in which the abandonment of buildings to workmen is advocated. The majority uphold the dignity of the architect, and it might be imagined that some of the writers would like to see the creation of a hierarchical caste

from which every man who meddled with business was excluded. But as they are in revolt against the existing system of practice their book is utilised as a means for the repetition of an attack with the weapons that have already failed.

It is strange, however, that the writer has not profited by experience. He addresses the public, but he will not employ the arguments which have most influence with them. Their interest in building is determined mainly by questions of cost and convenience. Yet the reviewer does not condescend to treat of one or the other, as if he were an inhabitant of Utopia. He scorns the conditions of the everyday life which is around us, and from which we cannot escape. Thus in one place he writes:—

Most people seem to think that building is a recondite, mysterious art, requiring much instruction, special talent and peculiar experience; whereas no work is simpler or more practicable by any man of sense. Of course it must be so. By nature men were meant to live in houses, and for this reason Providence has given to almost all men aptitude for building handicraft, and for the rational arrangement of a plan. Nothing but joyful carefulness is further needed. Here in London, on account of the pernicious and demoralising tenure of the land, to build is held to be in some respects degrading, and the well-to-do affect and cultivate peculiar ignorance even of the houses that they live in. On this affectation and this ignorance the Royal Institute of British Architects is founded. Architecture, the most popular of the arts, cannot exist or thrive on leaseholds; it is essentially of freehold origin and growth; it springs from absolute possession, and in London consequently it at present is impossible. It is a silent art, and grows unconsciously in practicable development, and not by means of talking Institutes and tumid lecturers. It is deliberate, for permanent enjoyment, and not hasty, for a speculating gain. Were the people fairly well instructed in the first necessity of family existence, so that they might build, or supervise the building of their houses, this absurdly Royal Institute would have no *locus standi*, and would quickly disappear.

We agree with the writer that the leasehold tenure is a drawback to good building, and it would be an advantage to have more deliberation about work and an avoidance of speculation. But obnoxious as are those evils, they surround the majority of building undertakings in this country. Are people to defer building until leaseholds are superseded by freeholds, or until they can become silent, deliberate and regardless of profits? If those virtues are requisite we may as well go back at once to the cave dwellings which nature has provided, for there is little likelihood of so superfine a life arriving within a century. Is it not plain, however, from his assumptions that the author admits his system of building is not adapted to the necessities of our time? If workmen are to be architects there must be clients with tempers that cannot be ruffled, and the men who labour must be either rogues or angels.

Although our author believes that almost every man has an instinct for some building handicraft and for evolving rational plans, he has to admit the rarity with which those natural gifts are utilised. In one passage he says:—

Since art is the enjoyment of the workman, what a scene of misery is London! The whole place is an emphatic art negation. As we have discerned, the showy buildings are a sham; but the immense majority of dwelling-houses have not even a pretence of art. This all means unhappiness; the constant loss of that enjoyment which has been designed by Providence for those who labour. At the present time, and largely owing to the folly of the middle-class, who train the children of the working-class in that contempt for work which is the worst and most degrading form of education, these young people are diverted from the workmanship which should be their delight, and are induced to think a handicraft beneath them. Household work is wholly strange, and is not even to be hinted to your educated Board-school girl; and boys regard their fathers' trade and artisanship with an insolent aversion. The ambition of the younger artisans is not to do their best in art, but to escape from handiwork entirely. Mere acquisition is their aim; that they may spend their money in the current travesties of art, and add themselves to the insatiate votaries of social folly. Thus four millions out of five who live in the metropolis are constantly demoralised in their life's work, and the remaining million in their obvious expenditure. The houses, furniture and dress of Londoners are a display of epidemic imbecility, and those who should be the most influential in a possible reform seem most incapable of general improvement.

When the tendency of life is towards depths of that kind, the reviewer, instead of decrying architects, ought to give praise to those among them who are endeavouring to keep themselves and their art in a state of uprightness. They are heavily handicapped, and yet they continue to keep a straight course. For the writer should remember that the peculiarities of architectural practice in England

were not entirely the creation of the practitioners. They arose out of the altered conditions of life. As clients have become more mistrustful of builders and workmen, the architect's functions as an overseer, auditor and agent have increased. His character as a man of business is with most clients of more importance than his artistic power. Only a minority of Englishmen are able to appreciate architectural art on right grounds, but every one can resent the weakness which produces a lawsuit with a contractor or a neighbour. If an architect's skill as an artist caused disappointment the Courts would not give redress, but neglect of his duties as an agent would be likely to be punished by the judges and juries.

On that account it seems to us to be vain to expect that ordinary people will ever yield to any application for such a transference of responsibility as is proposed in the *Quarterly Review*. Cases might arise in which American precedents would be followed, where a commission is divided between a designer and a superintendent of construction. But with opinion as it is, the workman has no chance of such a trust as now belongs to an architect. It is the peculiar character of workmen which helps to keep up the existing procedure, and makes it necessary that at least a clerk of works should remain during all operations, even when the building is not of importance.

To say that in the Middle Ages the workmen were the architects is merely an endeavour to deceive readers who are ignorant. The conditions under which works were then carried out were different from those which now prevail. For churches and ecclesiastical buildings there were monks to exercise superintendence. But if the workmen ever possessed the charge of works they were unable to retain the office. As early as the thirteenth century they came under the sway of professional architects.

But the writer in the *Quarterly Review* does not believe that the progress of architecture was determined by important buildings. He cares little for masterpieces, and fancies that builders and clients in all ages resembled him. It is in the village and among ordinary houses that he would seek inspiration. We have no desire to undervalue the domestic architecture of England, and if rightly considered it can be turned to good account by modern architects. It is not, however, to be credited to the unaided skill of the village workmen. The houses were generally raised by builders whose training was not obtained by apprenticeship to one trade. They were able to draw plans as well as to interpret them, and could derive hints from architectural works. But with all his merits, the country builder was unable to advance with the times, and architects are not to be blamed because he was left behind.

It is too absurd, too like the conduct of the wolf in the fable, to make architects responsible for what took place more than a century ago. According to DRYDEN, "The first physicians by debauch were made, Excess began and sloth sustains the trade." But the man would hardly be considered as sane who went about advising people to have recourse to the "simples" of old women in villages, or the lancet of a barber. Rustic art and medicine can be admired without incurring an obligation to be ruled by them.

From all that is said about the Institute of Architects, it might be imagined that the object of the review was to condemn that body. But the writer after all is not as severe in judging the evils which seem to be inherent in the Institute as are some of the most prominent members. There is probably not another society in Britain with so many discontented members. But the gregariousness of human nature keeps them from revolt. The Council, we are sure, must in their hearts agree with the reviewer when he says, "If wise parents wish to make a youth a real architect they should avoid the Institute entirely," and refers to "that great cavern of despair whose entrance is the Royal Institute of British Architects." There is hardly one of the thirty odd pages of the article which does not contain remarks which are as wounding. But if sarcasm could reform the Institute it would not now hold so anomalous a position among English societies. It is, however, hard that the misdeeds of the Institute should be debited to the general body of architects, and, if the reviewer were better acquainted with reality, he would have treated that part of his subject with more discrimination.

HISTORY OF LOCKS AND KEYS.

AT the meeting of the Society of Architects at St. James's Hall, Piccadilly, on the 24th inst., a paper was read by Mr. Harry W. Chubb, A.M.Inst.C.E., entitled "The Art and Mechanism of Locks and Keys, with some Remarks on Modern Strong-rooms."

Mr. Chubb said:—The study of locks and their keys, historically considered, does not, as in the case of successive styles of architecture, exhibit a direct and continuous connection between utility and form. Of grille-work and of other branches of the ironworker's art it may be said that use and ornament are often, and in fact generally, found together. The development of locks, however, is chiefly noticeable from the mechanic's standpoint, and as such is extremely interesting. When ornament is seen it is usually a pure addition *per se* to the mechanical parts; but a few cases do exist in which form and decoration can be distinctly traced back to a useful purpose. No information about locks is at present obtainable earlier than the time of the Pharaohs. Sculptured at Karnac is a lock which, to all intents and purposes, is similar to that used in Egypt now. That such a survival should exist might be doubted, but for the fact of other survivals of ancient methods and appliances in the East. Homer is not silent on the subject. He speaks ("Odyssey," xxi.) of Penelope using a brass key, very crooked and hafted with ivory, to open her wardrobe. Eustathius, a Greek commentator living at Constantinople about A.D. 1170, writing on Homer remarks that this kind of key was very ancient, but was still in use in his day, although keys with wards had been since invented. This form of key is sometimes dug up, and specimens may be seen in the Guildhall and other museums. It was probably used either to draw back the bar or bolt which slid in staples across the door, or else it was used only to withdraw a pin or catch that secured such bar in its locked position. One noticeable peculiarity of the Egyptian, and in fact of nearly all locks down to the middle of the last century, is that they needed no key to lock them. The bolt invariably carries with it the auxiliary mechanism—be it springs, pins or catches—with which it is secured in the locked position. No doubt this way of making a lock, that was in a sense automatic, was accidental rather than intentional.

The Roman locks were like the Egyptian ones, inasmuch as a partial sliding of the key was necessary. But more intricacy is attempted in them: the auxiliary pins holding the bolt are grouped closely, and are varied in section from the plain, round or square; the key, too, has to turn a quarter-circle before reaching the pins. Some ornamentation on the key-shafts or handles is noticeable.

In this era appears the padlock. Securing merchandise and treasure in transit, a knowledge of its mechanism became widely diffused, and the exact principle of these early padlocks is to be seen in those of India, China and Japan at the present day. Among Roman keys are many small ones attached to finger-rings, and these rings in a few specimens are also provided with seals. Locks and keys of the Byzantine era have not come under the author's notice, but there is little doubt that some attention must have been given them, for the age was a mechanical one.

Early English keys have their bows made in the shapes of ecclesiastical symbols. Some of these remain to us in bronze.

That most interesting period of metal-work, and, in fact, of many of the arts—the *Françoise*—contributes many beautiful examples of keybows. Chiselled carefully out of solid metal for the most part, they are perfect little embodiments of the spirit of the age, and must have been as highly prized then as they are now. Invariably Gothic in style, their delicate traceries are only equalled by the minute care displayed in the fanciful workings of their "bits." The locks which they served were provided internally with semicircular projections, around and through which the keys passed whilst being turned. These projections or "wards" were fastened in a separate case or box (hence called "box of wards"), and impeded all but the correct key whilst turning to reach and so withdraw the bolt. The decoration of the lock-cases consisted then, and later, of flat pierced plates, successively superimposed so as to form minute mouldings in Gothic tracery. Often the keyholes were hidden by some secret device.

Medieval German keys are hardly noticeable, but the lock-plates have a freedom of treatment and charm about them quite characteristic. The use of long springs at right angles to the inner end of the bolt led to a widening of the lock-plate at that end. To effect this the sides are spread out in graceful curves, or the end is made trefoil in shape. The surface decoration is light, generally consisting of two curved branches meeting below the keyhole. The branch ends divide up and carry conventional representations of flowers embossed and incised, whilst the meeting stems of the branches form distinct guides by which to find the keyhole on a dark night. Here, at any rate, are two points where usefulness has governed and produced ornament. The Renaissance did not at once give birth to new mechanism, but presentation and chamberlain's official

keys shared in the revival, or rather alteration, as to decoration. Departing from the beautiful four-sided structures of Francis's time, keybows become two-sided only, and show the cyphers of their owners, surmounted by crowns or coronets; tiny dolphins standing on their tails, and Venuses, in pairs, gazing with steel eyes at one another. About the commencement of the seventeenth century the letter padlock appears, altered and improved by a French engineer some 150 years later. Also in 1628 a most complete and special treatise on the locksmith's art was published by one Jousse, at Paris. Jousse, from the way he writes, evidently had to make his own tools and prepare his own metal. His key illustrations are in thorough keeping with the period. Regnier, the French engineer, who improved the letter padlock about the end of the last century was quite a mechanic. He has left us drawings of some ingenious keyless locks, to open which external knobs or dials had to be turned to certain marks. About this time, 1774, in England, Barren conceived the idea of improving upon what was known as the "tumbler." This was a spring-catch that "dogged" the lock-bolt, and had to be moved up out of the way by the key when turning, before the key engaged with the bolt itself. Barren cut slots in the flat part or "tail" of the bolt, and projecting stumps or pins on his "tumblers" closely fitted these slots. This idea subsequently developed into the lever lock. But a great advance was made by Bramah in 1784, despite the fact that the sliders upon which the security of the lock depends can be seen from the outside. In 1818 an ancestor of the writer's produced the Chubb's detector lock. From that time to this it has undergone various modifications and improvements: it has been assailed from many quarters, but it has held its own and still continues to do so, and that in an increasing degree. Modern arts give a wide range for the ornamental treatment of keys, and those made for presentation to the Queen and to other members of the Royal Family for recent functions have a decided character of their own. None of these keys are mere dummies; in every case they are constructed to operate the main entrance lock of exhibition or other public buildings.

It will, doubtless, be admitted that neither art nor craft can progress by simply copying previous work. It may under such conditions be said to exist, but the probability is that it will decline. To live healthily, and so to advance, minds and hands must work, either by arranging combinations of existing things, which shall be new combinations, or else by producing distinctly new things. In a measure the men who do either are inventors, whether designers or mechanicians. If these axioms be granted it is safe to say that the locksmith's craft, with power to requisition every movement in mechanics and to direct force in all its forms, is a craft capable of numerous possibilities.

There is a good deal of originality in some modern American locks, chiefly in those designed for meeting heavy risks, such as for the doors of bankers' vaults and safe deposits. For these purposes key locks have given place to keyless combination locks, and in many cases these are supplemented or else controlled by time locks. Time or chronometer locks are usually made with three movements and are wound up and set to allow the door to be opened at some predetermined hour before closing it for the night. A recent modification of this has been to dispense with the combination locks entirely, and to rely exclusively upon the timer for security. In this case even the handle to move the main bolts is discarded, and the necessary energy for shooting and subsequently withdrawing these bolts is provided by powerful springs. The timer controls the action of these springs. Thus it is possible to have a perfectly solid door through which no hole of any kind exists.

In the construction of vaults for guarding bullion and specie it is necessary to employ metal which, if attacked by burglars, shall be hard enough to resist drilling or other cutting instruments and at the same time sufficiently tough to resist fracture from blows. Numerous have been the attempts to produce a metal having both these qualities. That which according to the writer's experience has been found to give the best results is a species of armour plate manufactured by the well-known firm of Cammells, Sheffield. It is made precisely like the plates for warships, only, of course, not as thick. Some important work in this material is now under construction, and each piece or slab is rigidly tested before being incorporated in the structure.

Bolts for securing the doors of vaults have received considerable attention from inventors—more attention in England than America. In the latter country the revolving round bolt holds sway, but here there are numerous kinds. That system with which the writer is particularly connected is one in which the bolts do not shoot out at right angles to the edges of the door, but are made to do so in diagonal directions. Some point upwards and others downwards, with the result that when they are all shot out they dovetail their door to its surrounding framework.

It hardly falls within the scope of this paper to discuss matters connected with fireproof construction, but it is difficult to pass by the party-wall door of the Metropolitan Building A

without allusion. When the ruins of, say, a burnt-out city warehouse are visited these doors may be seen in various attitudes, some still in place but bent and twisted, others hanging simply on a single hinge, and still others fallen from their wall openings and lying in the midst of *débris*. As to fireproof structure in general the systems are so numerous that it must often be a matter of difficulty which to select. A paper dealing completely and quite impartially with these systems was recently presented at the Institution of Civil Engineers by Mr. Webster, C.E. ("Proceedings," vol. cv.). The writer mentions it because he thinks it may be of value to members of the Society for reference. It may be noted in connection with this, that the result of fire-test experiments on ordinary cement concrete—not on concrete specially prepared to withstand heat—was such as to prove it an unreliable material. Test blocks after being heated and suddenly quenched were found to have lost their strength, and on this account it may be better to use some variety of hard brick for the outer casing of bankers' vaults rather than introduce ordinary cement.

The paper was illustrated by diagrams and models.

IMPROVEMENTS AT EDINBURGH CASTLE.

THE military authorities are at present carrying out at Edinburgh Castle a series of alterations which will have the effect of not only enlarging somewhat the barrack accommodation, but improving the appearance of the large gaunt-looking building which tops the rock on its western side. For some time past, says the *Scotsman*, the accommodation for the men in this building, which is known as the New Barracks, has not been considered by the authorities to be in all respects satisfactory, and it may be remembered that the Duke of Cambridge made pointed allusion to the matter on the occasion of one of his official visits to the Castle. The alterations now being made will go some way towards meeting the suggestions which His Royal Highness then made. Along the western side of the building referred to and on the first floor level—that which is made familiar to the eye by its row of large circular-headed windows—there runs a corridor seven or eight feet wide, upon which the several barrack-rooms on that floor open. The interior wall which divides the rooms from the corridor is to be removed, and each room is to be lengthened to an extent equal to the corridor's width. Then, to preserve the existing communication between barrack-room and barrack-room, a verandah about eight feet wide will be carried along the exterior of the building from side to side. This verandah, which will of course be open, will have some architectural feature to recommend it, and will tend to break the monotonous plainness of the western elevation of the barrack building. It will be breasted by an iron railing about four feet high, and will be covered by a sloping glass roof carried to a height of about fifteen feet upon graceful iron pillars.

ALLEGORY IN ANCIENT ART.

NECESSITY first taught artists to use allegory. No doubt they began with the representation of single objects of one class, but as they improved they attempted to express what was common to many particulars, *i.e.* general ideas. All the qualities of single objects afford such ideas; but to become general, and at the same time sensible, they cannot preserve the particular shape of such and such an object, but must be submitted to another shape, essential to that object, but a general one.

The Egyptians were the first who went in search of images of that kind. Such were their hieroglyphics. All the deities of antiquity, especially those of Greece, nay, their very names, were originally Egyptian. Their personal theology was quite allegorical, and so is ours. But the symbols of these inventors, partly preserved by the Greeks, were often so mysteriously arbitrary as to make it altogether impossible to find out their meaning, even by the help of those authors that are still extant, and such a discovery was looked upon as a nefarious profanation. Thus sacredly mysterious was the pomegranate in the hand of the Samian Juno, and to divulge the Eleusinian rites was thought worse than the robbery of a temple.

The relation of the sign to the thing signified was in some measure founded on the known or pretended qualities of the latter. The Egyptian horseman was of that kind, an image of the sun, because his species was said to have no female, and to live six months under and six above ground. In like manner the cat, being supposed to bring forth a number of kittens equal to that of the days in a month, became the symbol of Isis or the moon.

The Greeks, on the contrary, endowed with more wit and undoubtedly with more sensibility, made use of no signs but such as had a true relation to the thing signified or were most agreeable to the senses; all their deities they invested with human forms. Wings, among the Egyptians, were the symbol

of eager and effectual services, a symbol conformable to their nature and continued by the Greeks, and if the Attic Victory had none it was meant to signify that she had chosen Athens for her abode. A goose, among the Egyptians, was the symbol of a cautious leader; in consequence of which the prows of their ships were formed like geese. This the Greeks preserved also, and the ancient rostrum resembled the neck of a goose.

Of all the figures whose relation to their intended meaning is somewhat obscure, the sphinx perhaps alone was continued by the Greeks. Placed in the front of a temple, it was, among the Greeks, almost as instructive as it was significant among the Egyptians. The Greek sphinx was winged, its head bare, without that stole which it wears on some Attic coins.

It was in general a characteristic of the Greeks to mark their productions with a certain cheerfulness. The muses love not hideous phantoms, and Homer himself, when by the mouth of some god he cites an Egyptian allegory, always cautiously begins with "We are told." Nay, the elder Pampilo, though he exceeds the Egyptian oddities, by his description of Jupiter wrapt up in horsedung, approaches, nevertheless, the sublime idea of the English poet:—

As full, as perfect, in a hair as heart;
As full, as perfect, in vile man that mourns,
As the rapt seraph, that adores and burns.

It will be no easy matter to find among the old Greek coins an image like that of a snake encircling an egg, on a Syrian coin of the third century. None of their monuments are marked with anything ghastly; of these they were, if possible, still more cautious than of ill-omened words. The image of death is not to be seen, perhaps, but on one gem, and that in the shape commonly exhibited at their feasts, *viz.* dancing to a flute, with intent to make them enjoy the present pleasures of life by reminding them of its shortness. On another gem with a Roman inscription there is a skeleton with two butterflies as images of the soul, one of which is caught by a bird, a pretended symbol of the metempsychosis; but the performance is of latter times.

It has been likewise observed that among those myriads of altars, sacred even to the most whimsical deities, there never was one set apart to death, save only on the solitary coasts which were deemed the borders of the world.

The Romans in their best times thought like the Greeks, and always, in adopting the iconology of a foreign nation, traced the footsteps of these their masters. An elephant, one of the latter mysterious symbols of the Egyptians (for there is on the most ancient monuments neither elephant nor hart, ostrich or cock, to be found), was the image of different things, and perhaps of eternity, as on some Roman coins, because of his longevity. But on a coin of the Emperor Antoninus, this animal, with the inscription "Munificentia," cannot possibly hint at any other thing but the grand games, the magnificence of which was augmented by those animals.

But it is no more my design to attempt an inquiry into the origin of every allegorical symbol among the Greeks and Romans than to write a system of allegory. All we propose is to defend what we have advanced concerning it, and at the same time to direct the artist to the images of those ancients in preference to the iconologies and ill-judged symbols of some moderns.

We may, from a little specimen, form a judgment of the turn of mind of those ancients, and of the possibility of subjecting abstracted ideas to the senses. The symbols of many a gem, coin and monument enjoy their fixed and universally-received interpretation; but some of the most memorable, not yet brought to a proper standard, deserve a nearer determination.

Perhaps the allegory of the ancients might be divided, like painting and poetry in general, into two classes, *viz.* the sublime, and the more vulgar. Symbols of the one might be those by which some mythological or philosophical allusion, or even some unknown or mysterious rite, is expressed. Such as are more commonly understood, *viz.* personified virtues, vices, &c., might be referred to the other.

The images of the former give to performances of the art the true epic grandeur. One single figure is sufficient to give it; the more it contains, the sublimer it is; the more it engages our attention, the deeper it penetrates, and we of course feel it the more.

The ancients, in order to represent a child dying in his bloom, painted him carried off by Aurora—a striking image, taken, perhaps, from the custom of burying youths at daybreak. The ideas of the bulk of our artists, in this respect, are too trivial to be mentioned here.

The animation of the body, one of the most abstracted ideas, was represented by the loveliest, most poetical images. An artist who should imagine he could express this idea by the Mosaic creation would be mistaken, for his image would be merely historical, and nothing but the creation of Adam—a history altogether too sacred for being either admitted as the allegory of a mere philosophical idea or into every place; neither does it seem poetical enough for the flights of the art.

This idea appears on coins and gems, as described by the most ancient poets and philosophers: Prometheus forming a man of that clay of which large petrified heaps were found in Phocis in the time of Pausanias, and Minerva holding a butterfly, as an image of the soul, over his head. The snake encircling a tree behind Minerva, on the above coin of Antoninus Pius, is a supposed symbol of his prudence and sagacity.

It cannot be denied that the meaning of many an ancient allegory is merely conjectural, and therefore not to be applied on every occasion. A child catching a butterfly on an altar was pretended to signify *Amicitia ad aras*, or, "which is not to exceed the borders of justice." On another gem, Love, endeavouring to pull off the branch of an old tree where a nightingale is perching, is said to allegorise love of wisdom. Eros, Himeros and Pathos, the symbols of Love, Appetite and Desire, are represented, they say, on a gem, encompassing the sacred fire on an altar; Love behind the fire, his head only overreaching the flames; Appetite and Desire on both sides of the altar; Appetite with one hand only in the fire, with the other holding a garland; Desire with both his hands in the flames. A Victoria crowning an anchor, on a coin of King Seleucus, was formerly regarded as an image of peace and security produced by victory, till by the help of history we have been enabled to give it its true interpretation. Seleucus is said to have been born with a mark resembling an anchor, which not only he himself but all his descendants, the Seleucidæ, have preserved on their coins.

There is another Victoria with butterfly's wings fastened on a trophy. This, they say, is the symbol of a hero, who, like Epaminondas, died in the very act of conquering. At Athens such a statue and an altar to an unwinged Victoria was the symbol of their perpetual success in battle; ours may admit of the same explication as Mars in chains at Sparta. Nor was she provided at random with wings usually given to Psyche, her own being those of an eagle; they perhaps signify the soul of the deceased. However, all these conjectures might be tolerable if a Victory fastened on trophies of conquered enemies could reasonably correspond with their being vanquished.

Indeed, the sublimer allegory of the ancients has not been transmitted to us without the loss of its most valuable treasures. It is poor when compared with the second kind, which is often provided with several symbols for one idea. Two different ones, signifying the happiness of the times, are expressed on coins of the Emperor Commodus: the one a lady, sitting with an apple or ball in her right and a dial in her left hand, beneath a leafy tree; three children are before her, two in a vase or flower-pot, the usual symbol of fertility; the other represents four children, who, as is clear by the things they bear, are the seasons. Both have the subscription "*Felicitas temporum*."

But these and all the symbols that want inscriptions are of a lower rank, and some of them might as well be taken for signs of different ideas. Hope and Fertility, for instance, might be Ceres, Nobility, Minerva. Patience, on a coin of Aurelian, wants her true characteristic, as does Erato, and the Parcae are only by their garments distinguished from the Graces. On the contrary, ideas which are often confounded in morality, as Justice and Equity, are extremely well distinguished by the ancients. The former is represented, as drawn by Gellius, with a stern look, a diadem, and dressed hair; the latter with a mild countenance and waving ringlets, ears of corn arising from her balance as symbols of the advantages of equity, and sometimes she holds in her other hand a cornucopia.

Peace, on a coin of the Emperor Titus, is to be ranked among those of a more energetic expression. The goddess of Peace leans on a pillar with her left arm, in the hand of which she holds the branch of an olive-tree, whilst the other waves the caduceus over the thigh of a victim on a little altar, which hints at the bloodless sacrifices of that goddess; the victims were slaughtered out of the temple, and nothing but the thighs were offered at the altar, which was not to be stained with blood. Peace usually appears with the olive-branch and the caduceus, as on another coin of this emperor, or on a stool placed on a heap of arms, as on a coin of Drusus. On some of Tiberius's and Vespasian's coins Peace appears in the act of burning arms.

On a coin of the Emperor Philip there is a noble image: a sleeping Victory, which with better reason may be taken for the symbol of confidence in conquest than for that in the security of the world, as the inscription pretends. Of an analogous idea was the picture by which the Athenian general Timotheus was ridiculed for the blind luck with which he obtained his victories; he was represented asleep with fortune catching towns in her net.

The Nile, with his sixteen children, is of this same class. The child that reaches the ears of corn and the fruits in his cornu is the symbol of the highest fertility, but those that overreach them are signs of miscarrying seasons. Pliny explains the whole. Egypt is at the height of its fertility when the Nile rises 16 feet, but if it either falls short of or exceeds that

measure, it equally blasts the land with unfruitfulness. Rossi in his collection neglected the children.

Satirical pictures belong also to this class: the ass of Gabrias, for instance, which imagines itself worshipped by the people as they bow to the statue of Isis on its back. It is impossible to give a livelier image of the pride of the vulgar great.

The sublimer allegory might be supplied by the lower class had it not met with the same fate. We are, for instance, not acquainted with the figure of Eloquence or Peitho, or that of the goddess of comfort, Parergon, represented by Praxiteles, as Pausanias tells us. Oblivion had an altar among the Romans, and perhaps a figure, as may also be supposed of chastity, whose altar is to be found on coins, and of fear, to which Theseus offered sacrifices.

However, the remains of ancient allegory are not yet worn out, there are still many secret stores; the poets and other monuments of antiquity afford numbers of beautiful images. Those who in our time and that of our fathers were busy in improving allegory and in facilitating the endeavours of the artists, those, we say, should reasonably have had recourse to so rich and pure a fountain. But there was an epoch to appear in which a shocking crowd of pedants should, with downright madness, conspire in an universal uproar against every the least glimpse of good taste. Nature in their eyes was puerile, and ought to be fashioned; blockheads, both young and old, vied in painting devices and emblems for the benefit of artists, philosophers and divines, and woe to him who made a compliment without dressing it up in an emblem. Symbols void of sense were illustrated with inscriptions giving an account of what they meant and meant not; these are the treasures which are dug for even in our times, and which, being then in high fashion, outshone all antiquity had left.

The ancients, for instance, represented munificence by a woman holding a cornucopia in one hand and the table of the Roman Congiarium in the other, an image which looked too parsimonious for modern liberality. Another therefore was contrived with two horns, one of them inverted, the better to pour out its contents; an eagle, the meaning of which is too hard for us to guess at, was set upon her head. Others painted her with a pot in each hand. Eternity was by the ancients drawn either sitting on a globe, or rather sphere, with a hasta in her hand; or standing with the sphere in one hand and the hasta in the other; or with the sphere in her hand and no hasta; or else covered with a floating veil. These are the images of Eternity on the coins of the Empress Faustina; but there was not gravity enough in them for the modern artists. Eternity, so frightful to many, required a frightful image—a form female down to the breast, with globes in each hand, the rest of the body a circling star-marked snake turning into itself.

Providence very often has a globe at her feet and a hasta in her left hand. On a coin of the Emperor Pertinax she stretches out both her hands towards a globe falling from the clouds. A female figure, with two heads, seemed more expressive to the moderns. Constancy, on some of Claudius's coins, is either sitting or standing, with a helmet on her head and a hasta in her left hand; or without helmet and hasta, but always with a finger pointing to her face, as if closely debating some point. For distinction sake the moderns joined a couple of pillars. It is very probable that Ripa was often at a loss with his own figures. Chastity, in his iconology, holds in one hand a whip (a strange incitement to virtue), in the other a sieve. The first inventor perhaps hinted at Tuccia, the vestal, which Ripa not remembering, indulges the most absurd whims, not worth repeating.

By thus contrasting ancient and modern allegory, we mean not to divest our times of their right of settling new allegories; but from the different manners of thinking we shall draw some rules for those that are to tread these paths. The character of noble simplicity was the chief aim of the Greeks and Romans, of which Romeyn de Hooghe has given the very contrast. His book, in general, may very fitly be compared to the elm in Virgil's hell:—

Hanc sedem somnia vulgo

Vana tenere ferunt, foliisque sub omnibus hærent.

The distinctness of the ancient allegory was owing to the individuality of its images. Their rule (if we except only a few of those above-mentioned) was to avoid every ambiguity—a rule slightly observed by the moderns—the hart, for instance, symbolising baptism, revenge, remorse and flattery; the cedar, a preacher, worldly vanities, a scholar, and a woman dying in the pangs of child-birth. That simplicity and distinctness were always accompanied by a certain decency. A hog signifying among the Egyptians a scrutator of mysteries, together with all the swine of Cæsar Ripa and some of the moderns, would have been thought by the Greeks too indecent a symbol of anything whatever, save only where that animal made part of the arms of a place, as it appears to be on the Eleusinian coins. The last rule of the ancients was to beware of signs too near akin to the thing signified. Let the young allegorist observe these rules, and study them jointly with mythology and the remotest history.

NOTES AND COMMENTS.

THE fifteenth annual general meeting of the members of the Royal Scottish Society of Painters in Water-Colours has just been held in Edinburgh. The president, Mr. FRANCIS POWELL, R.W.S., was chairman. The secretary, Mr. J. WRIGHT ROBB, submitted the balance-sheet, and read his report, in which reference was made to the exhibition of the Society, and the success attending the same. The income for the year amounted to 312*l.* 17*s.* 9*d.*, and the expenditure to 280*l.* 13*s.* 9½*d.*, leaving a surplus of 32*l.* 3*s.* 11½*d.* on the year's working. The balance at the credit of the capital account now amounts to 883*l.* 2*s.* 2*d.*, being an increase of 67*l.* 3*s.* 11½*d.* since last year. The following were appointed office-bearers:—President, FRANCIS POWELL, R.W.S.; vice-president, WILLIAM M'TAGGART, R.S.A.; treasurer, A. K. BROWN, A.R.S.A.; auditors, WILLIAM YOUNG and JOHN SMART, R.S.A.; secretary, J. WRIGHT ROBB.

THE following papers will be read at forthcoming meetings of the Applied Art Section of the Society of Arts:—On February 7, "Pottery Glazes: their Classification and Decorative Value in Ceramic Design," by Mr. WILTON P. RIX. On February 21, "Wall-papers and Stencilling," by Mr. T. R. SPENCE. On April 11, "History and Development of Pattern Designing in Textiles," by Professor PAUL SCHULZE. On May 9, "Primitive Art in Egypt," by Professor FLINDERS PETRIE. Mr. LEWIS F. DAY will begin a course of four Cantor lectures upon "Some Masters of Ornament" on April 10. Mr. C. HARRISON TOWNSEND will give two lectures upon "The History and Practice of Mosaics" on May 8 and 15.

It has been determined to erect a statue of ANTOINE WATTEAU, the most charming of the French painters, at Nogent-sur-Marne. He was born at Valenciennes, and there he ought to be honoured. WATTEAU's connection with Nogent was of brief duration. He suffered from weak lungs. One of the priests of Paris prevailed with a gentleman living at Nogent to invite WATTEAU to dwell in his house. But the artist did not long survive the change, and died at Nogent in 1721. We have as much reason to erect a statue of WATTEAU in London, for he was at least a year there. But so fine a genius merits to have more than one memorial, and we wish success to the committee of artists who have undertaken to collect funds for the statue in Nogent.

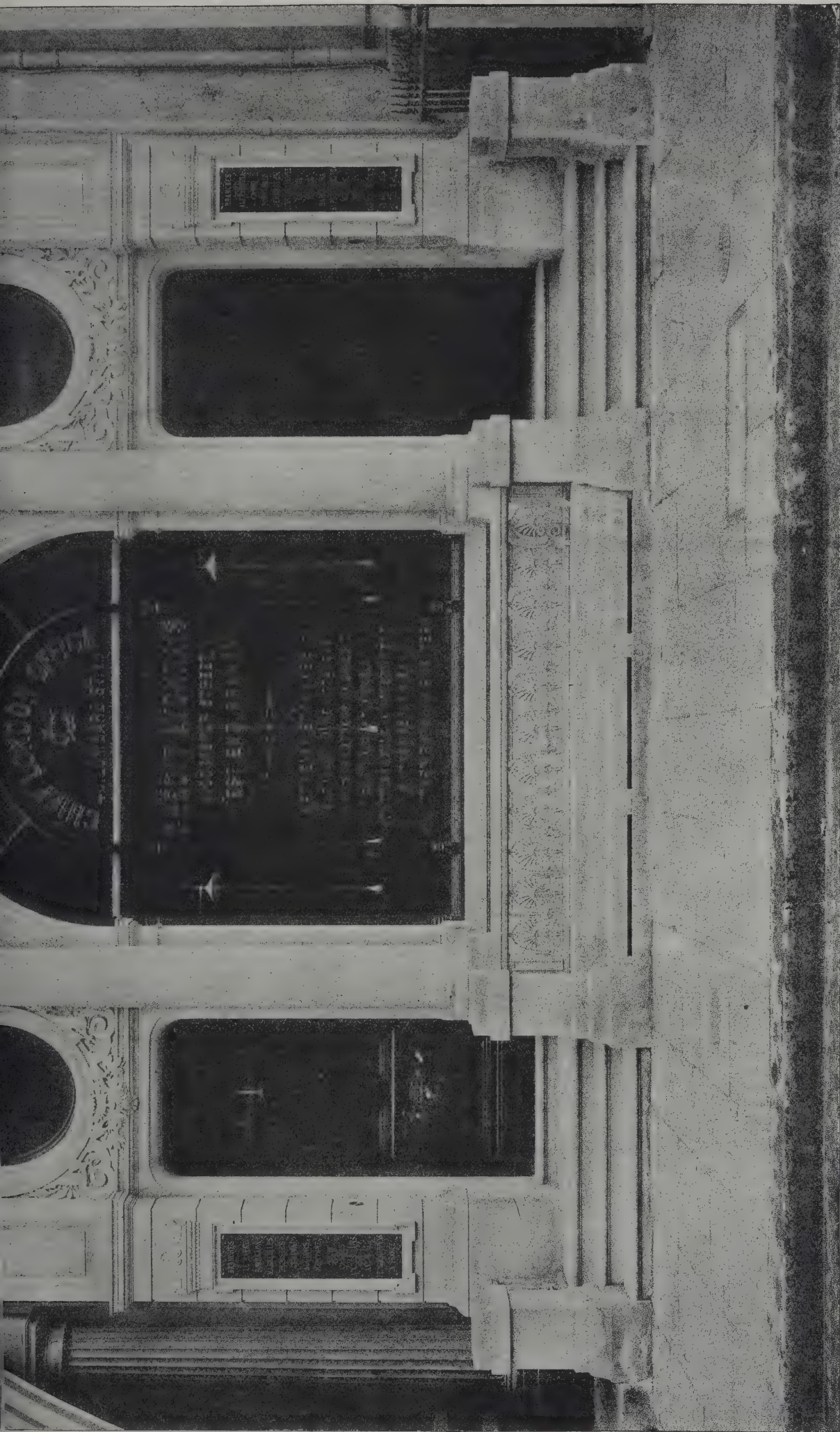
IN the New Quarterly Statement of the Palestine Exploration Fund there is a curious note on "Mud Showers and their Effect on Buildings in Palestine," by the Rev. J. E. HANAUER. He says that he happened to spend a Sunday at Nazareth last May. About fourteen years had elapsed since he had visited the place, and he was very much surprised at the change that had during that time taken place in the colour of buildings there. The Protestant Church, for instance, which in 1878 was fresh, white and conspicuous, had weathered into a light brown or yellowish tint, and was difficult to distinguish from other buildings near it; whilst, from the same causes, it was scarcely possible to recognise the Orphanage, situated on the hillside high above the town, and which, when new, could easily be seen at a great distance. On his return to Jerusalem Mr. HANAUER gave attention to the colour of buildings there. The first discovery he made was that whilst the city walls and towers were, generally speaking, both externally and internally, grey on their northern and western faces, which are most exposed to rain, yet that their southern and eastern faces, whether external or internal, were of different shades of tawny yellow, ochre or brown. Closer examination showed that this remarkable difference of colour in the eastern and southern faces from that of the western or northern was due, not merely to greater exposure to sunshine and protection from rain on the east and south, but to the presence of a curious coating or pigment, varying, according to the hardness of the stone it adhered to (or to the angle of protection and cover afforded by projections or buildings near), in the shades of

yellow, ochre and brown; and further, that these tawny patches of colour are found not only on old buildings such as the city walls, the Church of the Holy Sepulchre, and minarets, &c., but also, and with equal richness of colour, on some modern ones known to have been built before 1860, for instance, on the south wall of Christ Church, and on the oldest part of Bishop GOBAT's School. These observations led Mr. HANAUER to make special inquiries on the subject, and he was told by several old European residents that the yellow colour was caused by a remarkable shower of yellow mud which fell about thirty-five years ago. Professor ROTH, of Munich, examined this yellow mud and found it to consist of sand similar to that found in some parts of the Sinaitic peninsula and to contain many minute shells also found in that region. The rain of clay happened in the year 1857, probably in February. There were showers of rain before, then scirocco came for a few days. That evening the sun disappeared, and then, in the night, there followed a shower of rain which brought down all the very fine dust in the air. All channels were stopped up with a sort of fine clay of yellow colour, and everything exposed was painted yellow, but the following rains washed off a good deal. "Gakooli" stones, however, remained yellow, as they usually become by the process of exposure to sun and rain, whereas harder stones keep the natural colour. Such a rain mingled with clay has since then fallen on several occasions, but only slightly, and never in any quantity worthy of comparison with that above mentioned. Sometimes small shells fall with it or may be detected in the sediment. The phenomenon does not appear to have been noticed before, although it has much to do with the appearance of Eastern buildings.

THE Mahârâja of JEYPUR is a prince who is enthusiastic about art, and especially architecture. He has already expended large sums on building, and it will be remembered that his engineer, Colonel JACOB, recently described in London the efforts of the Mahârâja to secure large measured drawings of the details of Indian work, which were afterwards lithographed. He now proposes to erect a palace, and application has been made to the Madras Government to authorise the consulting architect to prepare a design. As in India there are now several English architects who depend mainly on non-official commissions, they are not satisfied with a proposal which would give an important work to a functionary who should have claims on all his time by his duties. An aggrieved architect, in a letter on the subject in a Bombay paper, says:—"Both as a taxpayer and an architect I protest against permission being granted a public official on full-time pay to design and carry out large works for native princes or any private persons whatsoever. There is not the slightest excuse for this plan of supplementing official salaries by the oblique road of what is euphemistically called honoraria, but which practically amounts to underselling private practitioners. Neither the Government nor the public need be informed at this time of day that there are several able and even eminent architects whose lives are cast in private practice in India, and for public officials on regular salaries to enter into competition with them and take, so far as they are allowed, the bread out of their mouths—this, I say, constitutes not only a grievance but a scandal. It is not the policy of Government to blast, but to encourage private enterprise, and the Home Government only the other day set a notable example of this in binding the highest law officers of the Crown to be content with their salaries and not to compete in private practice with the members of the Bar. So long as outside practitioners of unchallengeable position are to be found in India, no public works officer has any right to interfere with their prospects or career." It may be a question of policy to sacrifice occasionally the interests of civilians in order to insure the presence of a great many military engineers in India. But official architects would not be expected to take prominent parts if the Russians arrived. There is no need, therefore, to adopt extraordinary measures to encourage them to remain in India. If private architects with or without the aid of ghosts in London can design a costly palace for the Mahârâja, the Government should allow them fair play.

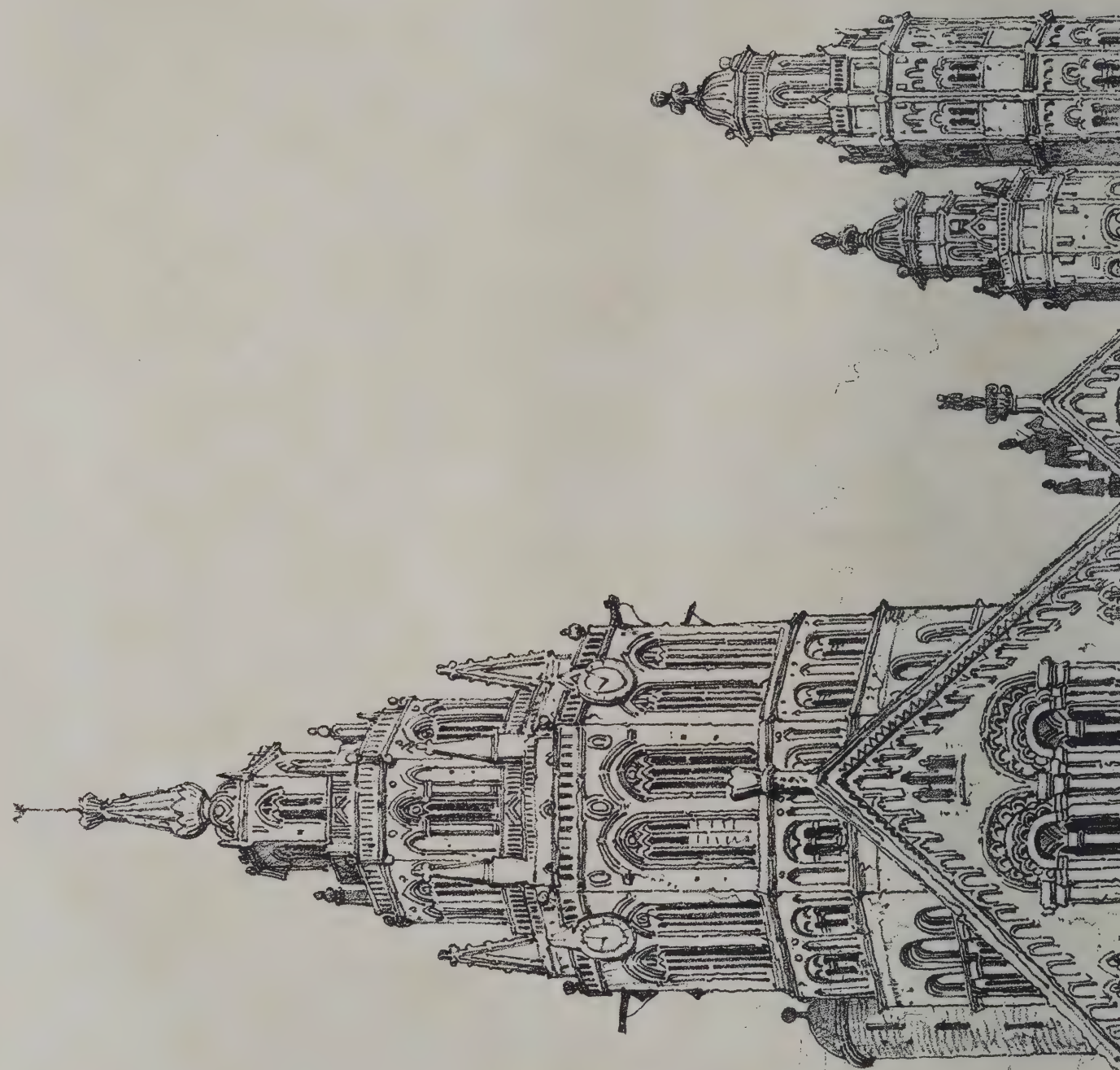
The Architect. Jan. 27th 1893.

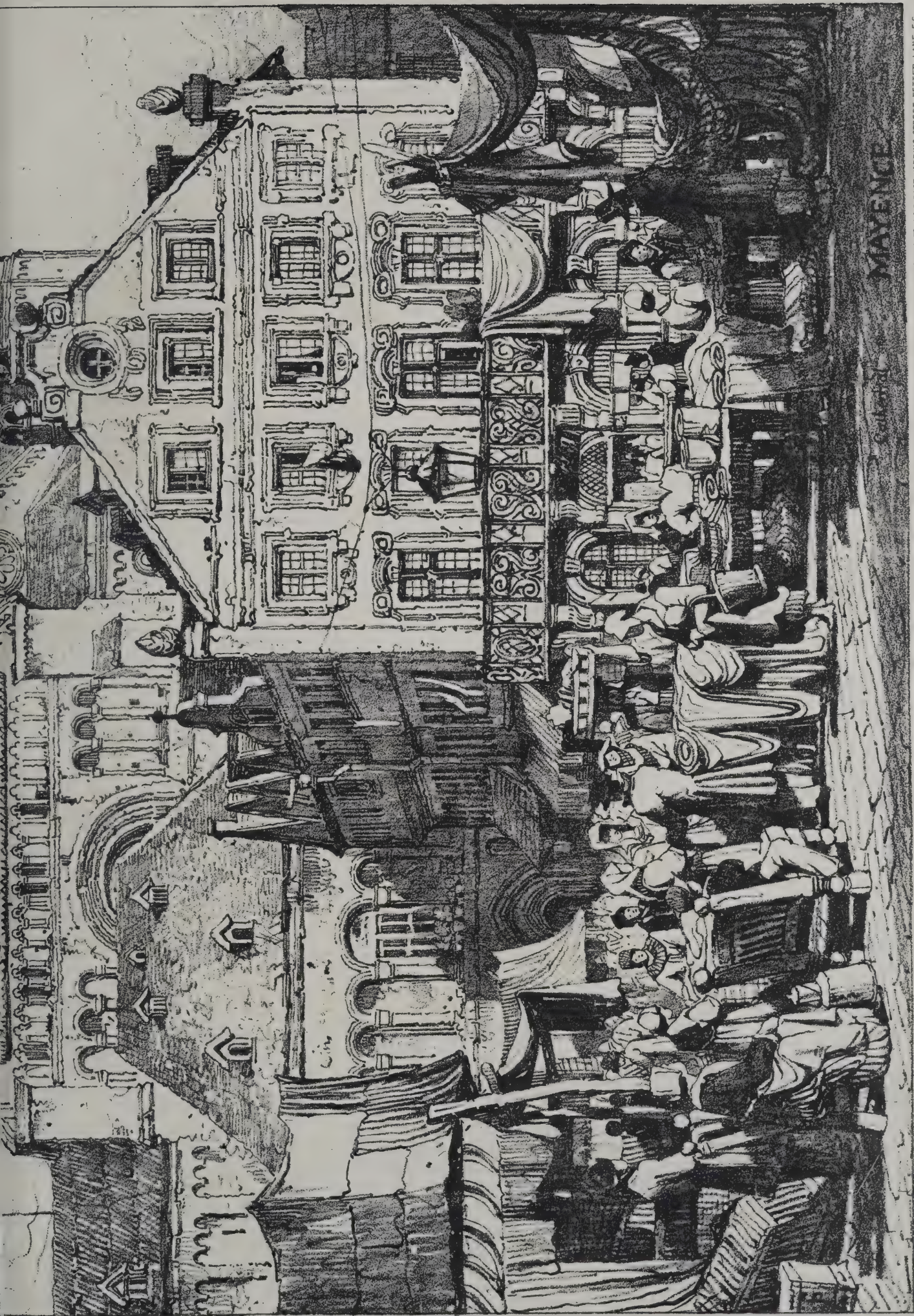




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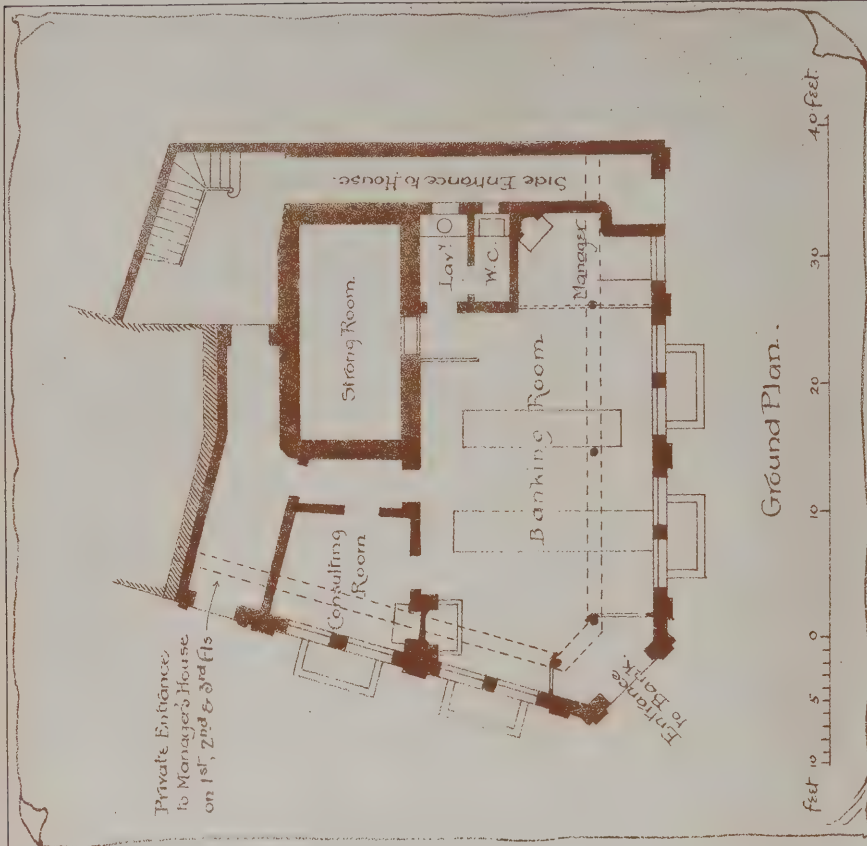
CREDIT LYONNAIS, COCKSPUR STREET, LONDON, S.W.
Messrs. DAVIS & EMANUEL, Architects.





THE CATHEDRAL, MAYENCE.

PHOTO-LITHO. SPRAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.





New Premises for Lloyd's Bank Limited Bexhill-on-Sea. Arthur Wells & Co. Architects

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ILLUSTRATIONS.

WEST END BRANCH, CREDIT LYONNAIS, COCKSPUR STREET, S.W.

IN designing a bank for the great financial company, it was fitting that French Renaissance should be employed. Everybody assumes that architecture, as many other things, is better managed in France than among us, but we imagine that the directors of the *Crédit Lyonnais* would be the first to acknowledge that Messrs. DAVIS & EMANUEL have been as successful as any of the numerous French architects who were employed to erect banks and offices for the company. The illustration is from a photograph by Messrs. BEDFORD, LEMERE & Co.

THE CATHEDRAL, MAYENCE.

WE have to apologise to many correspondents who have written to us complaining of the delay in the publication of PROUT's drawings. As we explained on a former occasion, there are many causes which interfere with the regular production of the parts of a series in a journal like *The Architect*. As the whole of the plates are now on stone, subscribers may be confident that they will receive all the examples of PROUT's works, which we have undertaken to produce.

NEW PREMISES, LLOYDS BANK, LIMITED, BEXHILL-ON-SEA.

THESE premises, recently completed at Bexhill for Lloyds Bank, Limited, were erected from drawings prepared by Mr. ARTHUR WELLS, F.R.I.B.A., Hastings, and erected by Mr. PETER JENKINS, builder, St. Leonards-on-Sea. The arrangement of the bank is shown on the ground-floor plan, above which is the manager's residence, with private and back entrances. The upper part of the building is set back by reason of the estate regulations as to the building lines. The building has been constructed of local red bricks; the moulded bricks have been manufactured by Messrs. KENWOOD & Co., of Beauport, near Hastings; the roof is covered with Elterwater (Westmoreland) green slates, and the doors and sashes to the banking-room are of polished teak. The tile floorings were supplied by Messrs. MINTON & Co., the ornamental ironwork by the Coalbrookdale Co., and the constructional ironwork by Messrs. ROWNSON & DREW.

WHAT IS ARCHITECTURE, AND HOW CAN IT BE ADVANCED?*

I THINK this age is foolishly ungrateful to the fine arts. This ingratitude is mainly due to ignorance, though partly to the low ideal standard of the age, and to its enrichment through scientific discoveries. If the bulk of people were asked the uses of the fine arts, they would probably say they were innocent recreations, to be classed with cards, billiards and dominoes; yet if they would take the trouble of examining the furniture of their own minds, they would find that nearly all they know, and nearly all they feel, was due to the teaching of the fine arts. If men of science were excluded, and if it were possible to extinguish in the rest of Christendom all that has learned from poetry, eloquence, the drama, dancing, music, painting, sculpture and architecture, in what would it differ from its ancestors, the monkeys, except by having clothes, money, and the multiplication-table?

Painting, sculpture and architecture present finished pictures of some beauty, art or emotion which it is important for mankind to be acquainted with, and it conveys this lesson at once; and the other fine arts do the same in a short space of time. It is, too, the chief method that nature herself adopts for our delight and instruction; the sublimity, the beauty, the solemnity, or the ugliness nature presents us with in her works strikes us at once. We are equally moved by the howling of the winds, the crash of the thunderstorm, the fury of the sea, the rumbling of the earthquake, or the explosion of the volcano. No laborious investigations are wanted to produce our emotions from these causes; and this is necessary, for man has to get his living by work, and must lose the emotions of delight or horror, and the lessons they convey, if they could only be got by laborious discovery of nature's laws, or by the patient following of her procedure. Far be it from me to depreciate science, which has in astronomy acquainted us with the marvels of nature's sublimest work; has given us at once new views of the Creator's procedure, and has discovered innumerable laws that are applied to our use. But while we are astounded at "yonder hundred million spheres," we should not be ungrateful for

"all the silvery gossamers that twinkle into green and gold." It is neither my part, nor my wish, to depreciate any one, much less the great men who have devoted themselves to science, and have conferred such benefits upon us; but I certainly do wish to make artists and their arts appreciated, and to show the inestimable gifts they have conferred, and do confer, on mankind. It is only when we know that it is mainly through the fine arts that Christendom is in the van of civilisation that we can appreciate the gross ignorance of those who overlook them, and the black ingratitude of those who depreciate and decry them. Mr. Eidlitz, in his "Nature and Function of Art," truly says:—"The true artist . . . becomes a teacher and prophet to his race whether he knows it or not. Poetry and painting, music, the drama, sculpture and architecture depict emotions which, by a process of mental contagion, generate sympathetically other emotions, and thus teach men to feel ideas which they could not comprehend in their abstract form." We can spare no art and no science, for each science reveals to us that particular mystery it studies, while each fine art not only has its own particular expression, but is lord of that country that no other fine art can invade; so that if one could be lost mankind would be deprived of that part of instruction and delight that it conveys, and that all the rest of the fine arts together could not supply.

The first inception of almost all the works of the fine arts is under some strong emotion, and when the artist deals with words they naturally flow in a rhythmical form. When the poem is long the poet has by the vividness of the picture in his mind and by his art to sustain that emotion in his finished work. His emotion is twofold, that caused by the conception itself and by his desire to excite the same emotion in his hearers. Until lately the words of poetry were enforced by music. Burns spoiled his most exquisite song, "Ye Flowering Banks of Bonnie Doon," because no composer he knew could fit it with a suitable tune. The subjects of poetry were written in verse, not only because it is the form that impassioned language takes, but because verse is more easily remembered than prose, and for the latter reason brevity is a merit. Hence the poet not only compressed his sentences, but used happy words that suggested much, as "The starry Galileo with his woes." The more vivid utterances and pregnant sentences of the poet were impressed on the minds of the hearers, so that language is very much of a mosaic, made up of the striking phrases of the poets. In the days of antiquity Homer's poem was the bible of the Greeks. Soul-stirring strife and tragic episodes abound in it, while the avenging of wrongs, the defending one's country, the contempt of pain and death, the exercise of hospitality and the due worship and reverence for the gods formed a moral code, and the incidental pictures of life both at home and in a far-off country made it delightful.

It may be remarked that the faith of antiquity was mainly gathered from the poets, for they were looked on as inspired by the divinities.

For he on honey-dew hath fed,
And drunk the milk of Paradise.

The real poet is inspired by the age in which he lives, but we may say that his poetic temperament has been bequeathed to him by his parents, who mostly lived in times when every fibre was in tension from wild hopes and desperate fears. The Trojan War, the invasion of Greece by the Persians, the Roman struggle with Carthage and its civil wars, the Crusades, the emergence of Florence, the change to Protestantism, the defeat of the Armada, the defeat of the Royalists, the wars of the end of the eighteenth century and the French Revolution were each followed by a galaxy of poets. The great poet, too, reacts on his age as its seer and prophet. We see an example of this in the late Poet Laureate, in whose works all the mental conflict of the age between the old and new faith, between knowledge and wisdom, are depicted, and a fair hope of progress is held out to humanity through the increase of knowledge, wisdom, courage, goodness and faith. These lessons and incitements, combined with the accurate portrayal of inanimate nature, of the great passions of mankind, of pageants and battles, of mysterious dreams and the ecstasies of saintly warriors and anchorites, made him the great poet of his age, whose words are on everyone's lips, and truly he treated our language as a skilful engraver treats a gem. Lawgivers, warriors, statesmen and even philosophers had learnt long before Horace's time that for their gifts or victories to be kept alive it was necessary to be sung by a poet, and for the same reason the winners of the Olympic games were allowed to dedicate a statue or painting of themselves, or a poem in their honour. We see how splendid literature gives to mortal things the nearest approach to immortality.

Many, many have lived who were valiant in fight,
Before Agamemnon; but all have gone down,
Unwept and unknown in the darkness of night,
For lack of a poet to hymn their renown.

* A lecture by Mr. G. Aitchison, A.R.A., delivered at the Royal Academy on Monday, January 23.

I must not devote too much time to this most fascinating subject, but to take only the novel of the day, how vividly we

remember the striking scenes, the unravelling of characters both good and evil, and how much of our current cultivation and morals is due to them; but literature deals with words and time alone, if we except the melody of verse and prose, and it can therefore only perfectly depict the words we speak and hear, what we think and what we feel; all else that it does is to suggest by words what we see.

Dancing, like singing, is a spontaneous manifestation of high spirits and joy, which naturally express themselves in rhythmical movements or sounds, and have been enlisted in the service of religion. We have all read of David dancing before the ark. The mountaineers who come to Rome at Christmas to sing carols not only enforce the words by the sounds of the bagpipe, but dance at the same time, and if asked to cease their dancing, which is not particularly graceful, say that the act of adoration is not complete without the dancing. Some of the most beautiful bas-reliefs of antiquity represent the frantic dancing of the Mænads. The drama shows us the action and expression of each person, lets us not only hear the language proper to each, but the tone of the voice, with its accent and cadences under emotion, and consequently we are more readily moved by it to tears or laughter, to hatred, indignation or contempt, than by any other fine art, but it is as perishable as a dream. The twin arts of sculpture and painting gave rise to their overmastering rival, written literature, but in combination they were the books of remote antiquity, and as there is no reason why sculpture should be white, they are but different developments of the same art; but this modern liking for sculpture in the white has perhaps caused it to be more exquisite in form, for if the colour of a picture be unpleasant we do not look at it, but fine sculpture does rivet our attention on its perfections in spite of its whiteness.

It is difficult to restrain oneself within proper bounds when speaking of the divine and entrancing art of painting, which preserves for us all the power and loveliness of the present, and conjures up for us all the glories of the past. In the mind's eye we see the roll of painters and their works, like Banquo's line of kings, from Giotto to Reynolds, from the seraphic visions of Raphael and the majestic picturing of Michel Angelo, through the divine harmonies of Giorgione, Titian, Schiavone and Paris Bordone, of Tintoretto and Paul Veronese, till we come to the depiction of the noble bearing and stately beauty of the lords and ladies by Moroni, Vandyke, Gainsborough and Reynolds, and those superb representations of the houses of the Netherlands by Peter de Hooze, and the episodes of its life in his compeers. To speak only of Italian religious pictures, they may be said to have given its current theology to Italy, as Milton's "Paradise Lost" is said to have given it to England. I may say that it is through the absence of pictures that so little is known in England of its history and achievements. In addition to these we have the whole range of landscape-painting from Peter Paul Rubens to Turner.

As we have two kinds of figure-painting so we have two kinds of landscape-painting, the one which depicts for us some particular piece or phase of loveliness or sublimity, and the other which calls up the emotion produced on the painter by some scene, beautiful, mysterious or terrible. The limitation of painting as compared with literature is that time does not come within its range, and I fear we are not now intimately acquainted with expression, while from the necessity in this climate of clothes, the ignobleness of their forms and the absence of artistic grouping, the depiction of contemporary life is scarcely fine art when it is without beauty or sentiment. Men in their natural state would probably group themselves as artistically as sheep in a field, but even sheep cease to be artistically grouped in a pen, and since artistic grouping has ceased, except on the stage, artists are driven to isolated instances of beauty or power and to the portrayal of the past.

Music, I am informed, is subject to mathematical rules in its composition, and to ears cultivated to comprehend it, it raises high and vivid emotions, and it does in some degree affect most of us. I have grouped architecture with music, partly because it has been called "frozen music," and partly because much of its beauty is owing to mathematical proportion, it is one of the visual fine arts that is not directly imitative; so I think we must first ask ourselves how it affects the completely ignorant, and I think it does so by its imposing mass. Ammianus Marcellinus says that Constantius, when he visited Rome, admired the vast mass of the Amphitheatre, and the Pantheon, with its vast extent, its imposing height, and the solid magnificence of its arches. Beholders judge of the nation by the objects for which vast buildings have been erected. The emotions of the less ignorant are, I think, mostly produced by the exhibition of work; in the case of Gothic, by finely pierced work; we hear—in France, at least—workmen and their wives admiring it, and declaring it looks like lace. These emotions are mingled in the educated, but, according to their cultivation, some more admire mysteriousness and exaggeration, while others more admire the grace and subtlety of proportion, and both admire beauty of outline. In most archi-

ture there is an inside as well as an outside, but except in religious monuments the inside can only be seen by the owner or by a select few. In some religious monuments the most impressive internal feature is the lighting, and this is especially so in Hadrian's Pantheon at Rome, whose lighting has a magical and weird effect, and it is only after several visits that attention is given to anything but the dome. Externally its size is by no means so apparent; the vast dome on its circular walls is more appreciable inside and more sublime, and at last we perceive the charm of its composition and its general finish. Sta. Sophia is, perhaps, the next most striking interior; its vastness is overwhelming, while the diffusion of light from hidden sources is marvellous, and afterwards we are awed by the great dome, seemingly supported on nothing. St. Mark's, I think, strikes us most by its richness, and there is at least a feeling of satisfaction that everything looks secure. Most of the Gothic cathedrals produce admiration by their height and length, and, when seen from the west end, for the endless repetition of vertical lines and diffusion of light from unseen windows.

In a few cathedrals, such as Strasburg, where the nave is very light, the gloom of the apse, with its masculine, Romanesque pillars, is impressive. At Seville and at Durham the massiveness of the piers are most noticeable; they look as if they had been built by Titans, and that these cathedrals are halls of Eblis. Milan is not striking inside or out, unless you see the outside by moonlight, or the inside at dawn on a winter's morning, when the interior is nearly dark, with a faint star of light from some altar, the piers looming darkly in the surrounding gloom, their capitals concealed by rolling mist, while the ambos form two black masses. Yet, for all this, many churches and cathedrals look imposing enough at vespers in the winter, with but one small chapel lit up, which glows within the gloom. I recollect being struck with Sta. Maria Maggiore on such an occasion, and with many of the French cathedrals.

Secular buildings are naturally much less striking, though this is scarcely true of the vast halls of the Roman baths. The Loggia dei Lanzi is one of the most striking, and of modern ones, the old Schloss at Berlin, with its plastered front and rococo details. To an architect the first impression of the Ducal Palace is the apparent want of support for the heavy-looking superincumbent mass, just as in Gothic cathedrals one asks oneself, How is it that the vault stands? It is not surprising that architectural monuments being so obtrusive, so gigantic, and sometimes so beautiful, should have forcibly impressed themselves on the minds of great poets and writers, so that literature is full of allusion to them, from "the cloud-capp'd towers" of Shakespeare to "cloisters, branch'd like mighty woods," of the late Poet Laureate. It is superfluous to speak of Satan's Classical palace in Milton, of which he says:—

Not Babilon,
Nor great Alcairo, such magnificence
Equal'd in all their glories.

De Quincey tells us that, in his opiate dreams, architectural visions haunted him, and Wordsworth, in his description of some clouds, saw nothing but architecture:—

The appearance, instantaneously disclosed,
Was of a mighty city—boldly say
A wilderness of building, sinking far
And self-withdrawn into a wondrous depth,
Far sinking into splendour without end!
Fabric it seem'd of diamond and of gold,
With alabaster domes and silver spires,
And blazing terrace upon terrace, high
Uplifted; here, serene pavilions bright,
In avenues disposed: there towers begirt
With battlements that on their restless fronts
Bore stars—illumination of all gems.

Think what architecture has done for the dumb nations of the past, for Egypt, Assyria, Persia and Mexico, who without it would be lost in oblivion. It points out, with a force second only to poetry itself, the grandeur and importance that a nation once enjoyed, and the point of civilisation it had reached. Mr. Ruskin is even more eloquent than usual on the effect of architecture in recalling memories:—

It is as the centralisation and protectress of this sacred influence that architecture is to be regarded by us with the most serious thought. We may live without her, and worship without her, but we cannot remember without her. How cold is all history, how lifeless all imagery, compared to that which the living nation writes, and the uncorrupted marble bears! how many pages of doubtful record might we not often spare, for a few stones left one upon another? The ambition of the old Babel builders was well directed for this world. There are but two strong conquerors of the forgetfulness of men, poetry and architecture, and the latter in some sort includes the former, and is mightier in its reality; it is well to have not only what men have thought and felt, but what their hands have handled, and their strength wrought, and their eyes beheld all the days of their life. The age of Homer is surrounded with darkness, his very personality with doubt. Not so that of Pericles, and the day is coming when we shall

confess that we have learned more of Greece, out of the crumbled fragments of her sculpture, than even from her sweet singers or soldier historians. And if, indeed, there be any profit in our knowledge of the past, or any joy in the thought of being remembered hereafter, which can give strength to present exertion, or patience to present endurance, there are two duties respecting national architecture whose importance it is impossible to overrate: the first to render the architecture of the day historical, and the second, to preserve, as the most precious of inheritances, that of past ages.

Again, like poetry, the remains of architecture help to raise barbarous nations to civilisation, for as Virgil inspired Dante, so did the remains of Roman and Byzantine architecture inspire the savages and barbarians that overran Europe and the East, to imitate and improve on what they found. Architecture ran a continuous course, though with some gaps, from Greek to Mediæval days, through Roman, Byzantine, Saracenic, Romanesque and Gothic, and though in most cases it lost some of its refinements, it must be called a progressive art up to the end of the Gothic period, for it not only embodied the thoughts and aspirations of various nations at various epochs, but it made continuous progression in construction, if we consider that at certain epochs it was taken up by savages and barbarians, who naturally knew nothing. And in the most civilised times, after the fall of Rome, the means at the disposal of the various nations were but slender. Gothic architecture attained a mastery of construction that has only been equalled by the engineering works of to-day, and a new æsthetic expression in tendency, outline and detail that is only to be compared with Saracenic, though Gothic surpassed it; for though the Renaissance did something to improve the appearance of architecture, it was by the adoption of exotic art, and it stopped both its constructive improvement and its æsthetic propriety.

It is unnecessary to ask what are the models in nature of figure-sculpture and painting, but we may well ask what are those of architecture. It is true that some hints may be got from nature in the forms of mountains and rocks—near Amalfi a stretch of isolated rocks looks like a Mediæval town—but these hints can but rarely be used, so I think we may fairly ask what architecture is, and I think we may say it is an effort of man to produce an organism so far resembling one of nature's that it answers its purpose completely, and, like hers, occasionally causes emotions in the beholder, but always has a distinct character.

Nature, as far as we know, not only does her work completely and perfectly—while man does his in a bungling way—but she makes her works answer other ends by means of the first, and, if we may say so, without effort, while man must use great effort to accomplish the two. We can scarcely doubt that the shapes of leaves affect plants electrically, and thus enable their roots to assimilate the different qualities of the soil in which they grow. Some assimilate that which becomes food for man, and some poison, while at the same time the forms affect us by their beauty or ugliness; but be they beautiful or be they ugly, they have a marked character.

The only comparison we can make between architecture and any of nature's organisms is in the case of animals with shells; but it is merely a superficial resemblance, for although the snail is said to carry his house on his head, it is merely a figure of speech. It is not its house, but a part of the creature, for the shell, I believe, acts as the fulcrum for its muscles. Some shells, and some shell-fish, strike us as peculiarly beautiful, some as commonplace, some as quaint or repulsive; but we have no reason to believe that one is less perfectly fitted for its purpose than another. The common crab is a quaint-looking creature, if not an ugly one; while the king crab looks as if it were designed by a Greek artist. Perhaps the simplest shell man ever made for a living man was an anker; but in this the anchorite ate, drank, slept and prayed, and though this cell had no door, it must have had an opening for breathing, for the introduction of food and the admission of light. I think, then, we may affirm two things; that except in the case of the anker the poorest shell we make is originally for a group of two, for the human unit is a man and a woman; and, secondly, that it will have a marked character if it is made to suit its use thoroughly, and is built properly. This character must mainly be got by making the proper arrangements for what the human unit does in its habitation, by the requirements in putting it together, and by the materials employed. Consequently we must know how these materials act, and how they can be properly put together. All matter acts according to laws, and the law which makes ponderous substances stand is statics. So we must at least understand this science, either by theory or practice. Some philosopher has said that "ornament is more natural to man than clothing," for naked savages have been found who have stained, coloured, or tattooed themselves in patterns.

I think, however, that what is now mostly called architecture did not arise directly from the gradual desire of man to improve his dwelling, but from a desire to appease or propitiate his chief deity; and as the savage had no model

but his cave or his hut, most early temples are but glorified caves, huts or houses. The Greek temple, which is undoubtedly the most perfect architectural work of early civilised man, and which has in certain respects never been equalled, was palpably a glorified hut; for though Fergusson insists most strongly that it had a different origin, we must believe Pausanias, who saw one of the original oak columns of the Temple of Heré at Elis, and the wooden pillar of the house of Enomaus was kept in his time as a sacred relic; and besides this, every part of the Greek temple points to its wooden prototype. Man, too, hungers for immortality; and the child, as the type of the savage, hungers for it too, but rather for those he loves and respects than for himself. So large stones, or heaps of stones, and mounds of earth have been raised by savage or half-civilised man to those who have benefited him, and they have also been used to mark great events.

It would be something for us all to know what architecture is, and very much for the student, for without knowing this he may follow a will-o'-the-wisp all his life and find himself in a quagmire at last. Architecture, from the first written record of it that has come down to us in Vitruvius, was treated as the art of building properly, and in a book of much more importance than Vitruvius and nearly as old, the New Testament, the architect is called "a wise master builder," and it was not, I think, till 1849 that we were informed that it had nothing to do with building. In "The Seven Lamps of Architecture" we are told "Architecture is the art which so disposes and adorns the edifices raised by man, for whatsoever uses, that the sight of them contributes to his mental health, power and pleasure." It is very necessary, in the outset of all inquiry, to distinguish carefully between architecture and building. To build, literally to confirm, is by common understanding to put together and adjust the several pieces of any edifice or receptacle of a considerable size. Thus we have church-building, house-building, ship-building and coach-building. That one edifice stands, another floats and another is suspended on iron springs makes no difference in the nature of the art, if so it may be called, of building or edification. The persons who profess that art are severally builders, ecclesiastical, naval, or of whatever other name their work may justify; but building does not become architecture merely by the stability of what it erects, and it is no more architecture which raises a church or which fits it to receive and contain with comfort a required number of persons occupied in certain religious offices, than it is architecture which makes a carriage commodious or a ship swift. I do not, of course, mean that the word is not often, or even may not be legitimately, applied in such a sense (as we speak of naval architecture); but in that sense architecture ceases to be one of the fine arts, and it is therefore better not to run the risk, by loose nomenclature, of the confusion which would arise, and has often arisen, from extending principles which belong altogether to building into the sphere of architecture proper. Let us, therefore, at once confine the name to that art which, taking up and admitting, as conditions of its working, the necessities and common uses of the building, impresses on its form certain characters venerable or beautiful, but otherwise unnecessary. Thus, I suppose, no one would call the laws architectural which determine the height of a breastwork or the position of a bastion. But if to the stone-facing of that bastion be added an unnecessary feature, as a cable moulding, that is architecture, by which we see that the architect is only a decorator of walls; and Fergusson, though he did not state it so crudely, had much the same idea, for the gross building should, according to him, be so superabundantly strong that it could be cut away where wanted for æsthetic reasons. He no doubt was thinking of rock-cut temples; but I think, without wasting our time on refutation, we may cast all such whims and oddities to the winds. You might safely incise a stone wall or a column, or put on either a slightly raised pattern, or cover a wall with plaster for painting or for mosaic, or you might veneer it with marble; but if you wished to enrich any part by deep carving without knowing anything about building you would put the building in jeopardy and probably cause it to fall, not to speak of losing the pride and boast of architecture, that she has created an organism in imitation of nature's own work. To show the paramount importance of constructive knowledge, I may say that even such masters of practical construction as the Mediæval architects were not always fully equipped; the abutments of vaults were generally not quite strong enough for the thrusts, as may be seen in the deformation of the angle piers of the transepts in most cathedrals, and absolute failures were not unknown; the central tower at Beauvais is said to have been built twice, and to have twice fallen.

I think we now know that to be architectural each building must be exactly fitted for the purpose to which it is to be put, that its materials must be properly used, and that the whole must be put together according to the law of statics, which will give us the proper sizes and shapes, and that if we do this thoroughly, even in a hut or cabin, it will have a distinct

character of its own ; but you must not think that because this is easily said it is easily done. Those things, however, we now call buildings are mostly groups of buildings. I think, too, that the common definition of architecture as building to obtain beauty is wrong—it is building properly, so that the true character of the building may be expressed. We certainly do not want to build a prison so that it may look beautiful, but so that it may convey repulsion and horror. We do not want to make a court of law beautiful, but to endow it with awe and respect ; for though law is said to be the perfection of reason, most of us pray to be delivered from the law, the world, the flesh and the devil.

Before we can properly sub-divide architecture we must consider life a little. We all must eat and drink, and I suppose in this climate be clothed ; and if our occupation is not hard, out-of-door work, we must be warmed, and all of us want to have our food cooked—man has been defined as “an animal who cooks his food”—and to be protected from the inclemency of the weather, at night at least. These things are absolute necessities, without which we die. The stores or warehouses that keep these necessities, or the shops that sell them do not raise high or deep emotions in us, except perhaps when we feel we shall die without them. We hardly ask for beauty in a coal store, a wool warehouse, an oyster, tobacco, drinking, or boot shop, but on the other hand, we ask for a certain amount of comeliness in all buildings, except where it would be improper ; for buildings are obtrusive things, and take from us the view at least, often both light and air, and always add to the pollution of a town. We want the highest sublimity we can attain in temples to the Deity, to whom we desire to express our thankfulness and submission ; the utmost stateliness and dignity in buildings for Parliament, as the laws made there ought to add to our happiness, and, good or bad, greatly help in moulding the character of a people, and there the measures are decided which give us peace or war ; grandeur in the mansions of great men who guide, instruct or defend the people, and also in the monuments to those who have preserved or improved the nation ; and some degree of beauty in every house, for it always contains some joy or some sorrow, and the education of the nations is carried on there, for though children may get their schooling elsewhere, most of them get their education at home.

It would be wearisome work, if I could do it, to enumerate the different aspects that each sort of building in a large city should exhibit, but I think we may roughly divide buildings into those for the common necessities for the continuance of life ; monumental, for those devoted to the higher aspects of human feeling and intelligence ; and mixed, for those which combine to minister to both. If man were as capable of making his buildings perfectly fitted to their uses as nature is, we should want no more instruction, for she succeeds in making most of her works beautiful ; and when she does not, it is probable that their repulsiveness is a warning against them, and is thus useful to man. She endows us with our senses, and with their likes and dislikes ; but this was not enough, for when the neglect of these instincts produces illness or death, she usually supplements the lesson by making the filth we accumulate or the unhealthy site we choose for a habitation a breeding-place for annoying or poisonous insects, to again warn us of the risks we run. The capacity of making the purely useful agreeable is far from being given to man. We see engineering structures as perfectly fitted for their uses as very clever and skilful men can make them, but we cannot say that the general result is beauty ; but on the contrary, the beautiful ones are most rare, the bulk of them are ugly, and some are hideous nightmares. We have seen that it is an injury to mankind to put up eyesores, but this is by no means the strongest case in architecture. Engineering works are mostly for commonplace purposes—that is to say, directly or indirectly, for the creation of more food, clothing and warmth ; but the highest class of architectural works, temples, monuments and tombs are mainly for emotional ends, and their object is to create or intensify such emotions, and not to diminish or destroy them. We have only two masters to go to—nature and former works ; and we must recollect that the future is but the unknown quantity, evolved from the present and the past. A great writer says, “The true men of progress are those whose point of departure is a deep respect for the past.”

It may be said—for it has certainly been done—that we have but to copy what produced such emotions in the past, and does still produce other emotions now ; but it must be borne in mind that some of our emotions are not those of antiquity, nor of the Middle Ages, nor of the East, nor even precisely those of our immediate predecessors, and that there is a certain meaning attached to certain architectural forms from their being associated with certain uses, as well as beauty attributed to forms from their constant association with the higher sentiments. The Romans associated the pediment with a temple, and were proportionately shocked and disgusted when Julius Cæsar was allowed to put one on his mansion ; from the same association Cicero thought pediments so beautiful that he

expected to find them in the Elysian fields. We associate a steeple with a church, a dome and minarets with a mosque, and the Mediævals of Italy a tower with a free town. The vast groined halls of the Roman baths suggest to us a Christian church. This must have struck Michel Angelo or the Pope, when the Trepidarium of Diocletian's Baths was turned into Sta Maria degli Angeli.

We ask, in all structures built for us, that our material wants may be satisfied and our emotions excited, when the building is for a use to excite emotion, and our neighbours and all beholders ask that it may not be an eyesore. This is in fact what the craving for novelty means, improvements to suit the wants and tastes of the present time. This at once raises the question that is all-important to this part of the subject, Have we got an architecture that does fulfil all the wants, satisfies the tastes, and expresses all the emotions of the day ? for if we have, nothing further need be said on the subject. But can we as architects truly say that the buildings of the present day give us the exact and perfect arrangement that is wanted, that they exhibit the use of the materials in the precise way in which they are most fitted to their purpose, and that the construction is perfectly adapted to the end in view and to the materials we must employ ? If we cannot affirm this we must admit we have failed, and this mainly applies to the building part ; the æsthetic and the emotional effect will require a fuller analysis. Yet this may be said, that so long as we hear the word “styles” in architects' mouths, we may be sure we have not succeeded, for what is a style in this sense ? It is the expression in building of the wants, the knowledge, the skill and the taste of a people or a nation in a different and in most respects a lower position than our own, whether that people were Greek, Roman, Byzantine, Saracen or Mediæval.

The Greeks and Romans were pagans. Jupiter struck with his thunderbolts people, buildings or towns that were impious. This is hardly our view of the cause of lightning. The captains of ships that sailed or rowed without a chart or compass, and got out of their course in a storm, attributed it to the anger of the gods for some sacrilege committed or some sacrifice forgotten, but this is not our interpretation. Socrates pronounced virtue to be incommunicable because Pericles's son had been taught to ride on two horses, and yet could not govern Athens. An English Prime Minister would hardly send his son to learn riding at Astley's to fit him for the post. Infanticide was not only practised, but was not even strongly reprobated ; they were slaveholders, and believed in witchcraft and the evil eye, and sacrificed living animals. This last we have abandoned—at least, since the old gentleman died in this century, who sacrificed a ram to Jupiter in his back parlour at Stoke Newington.

The Byzantines were orthodox Christians, industrious, turbulent, cowardly and cruel, besides being rotten to the core with corruption. The Saracens were fanatical Mohammedans, fierce and turbulent, torn to pieces by tribal hatreds, without much inventive genius, but with a passion for geometry and mathematics, and were also slaveholders. The Mediævals were at first little better than savages, but settled down, and after the early Crusades made a good deal of progress in the arts, and particularly in architecture. The bulk of the people were serfs, few but the clergy could read and write and all classes were bigoted Roman Catholics, as we see by the Crusade against the Albigenses. Science had scarcely begun to be studied, for the very suspicion of it was heresy. It was a time when, as a great writer says, “the highest result, at least on that planet, our earth, was a choir of priests chanting psalms.” Compare these separate stages with our own, in which science has completely revolutionised our views of our own position in the universe and of its government, in which time and space on this earth have to a great extent been annihilated, in which the most important events in the whole world that happened yesterday are brought to our breakfast-table in the *Times*, when the sun makes pictures for us and the powers of the air light up our houses of a night. Now in England almost everyone can read, write and cipher, and the masterpieces of literature can be bought for the price of a pot of beer. The whole world is better fed, clothed and taught than it ever was. New materials are to our hand, to which marble and granite for their resisting power are almost nothing, and we have advanced the science of statics to a height unknown before, when we can prevent pestilence and unravel the processes of vitality. Surely we must have something else to say in architecture than they had in the sixteenth century, not to speak of the thirteenth.

Taking the culminating period of the Middle Ages as having produced the greatest architectural works the world has seen for the combination of constructive skill with emotional expression, what visions do we see before us of a future architecture if we can make the one step forward—an architecture that will so completely overshadow these masterpieces of the Middle Ages that we shall look upon them as mere antique curiosities, kept only as landmarks to show our progress.

Think of the future temples to truth, to religion, of the buildings where the mysteries of nature are unravelled, where wisdom,

virtue, courage and intelligence are taught, when strength and beauty compete for the prizes, where the last triumphs of science and art are exhibited to the people; the temples where the people are purified, instructed and exhorted before giving their votes; of the tombs or cenotaphs to the benefactors of their country, or the world that will make the tomb of Mausolus seem but a wart.

INFLUENCE OF BYZANTINE ART IN ITALY.

(Paper by Mr. R. Phéné Spiers, continued from page 47.)

I NOW come to the cathedral of St. Mark's, Venice, a building which, inspired throughout by Byzantine work, and of which the main design was certainly due to a Greek architect, seems to me to have exercised the greatest influence on the Lombardian architecture of the twelfth and succeeding centuries. The early history of the present cathedral and of its predecessors has been traced by Cattaneo, to whom I am chiefly indebted for my information. It commences with the recovery of the body of St. Mark by Giustiniani Partecipazio in 829. In that year the Mohammedans of Egypt had determined to pull down the church of St. Mark of Alexandria, and the Doge Partecipazio succeeded in obtaining the relics of the saint in whose memory it had been erected. Nothing remains of this church at Alexandria, but it is believed to have occupied the site of the present Lazaretto. Giustiniani Partecipazio intended to erect a church worthy of these relics, but died before it was commenced, leaving the task to his brother, Jean Partecipazio, who succeeded him as Doge of Venice. The church was built between the site of the then existing Ducal Palace and the church of St. Theodore, which had hitherto been the chapel of the Ducal Palace. The church he built was probably of the usual basilican type, and in it were used up the marble columns and capitals which his brother Giustiniani had exported from Sicily after his conquests there. It is probable also that some of the materials were obtained from the ruined cities of Heraclea, Altino, Concordia, and others, for examples of all periods are found in the present church. In 976 the Ducal Palace was set fire to by an enraged populace, and the Doge, Pietro Candiano, was killed. The fire spread to St. Mark's, and partially destroyed it. The new Doge, Pietro Orseolo, commenced at once the restoration of both palace and chapel, but as he retired to a convent within two years, it is scarcely probable that he can have done more than to restore the old church to its primitive form, and there is no record of a continuation of building in succeeding years. It is quite impossible that so important a structure as the present St. Mark's could have been erected in so short a space of time, and as long ago as 1859 Selvatico, an Italian antiquary, questioned the accuracy of the tradition, having discovered a document in the archives of Venice stating that Dominico Contarini (1043-71) built the church of St. Mark's. 1063 is the date accepted by Cattaneo for its commencement—the same year that the rival Republic of Pisa commenced its cathedral. As Contarini became Doge of Venice in 1043, it is probable that long before 1063 the project was in contemplation. For the provision of ways and means there was no difficulty, as the Treasury of Venice was then richly stored and it was a question of setting forth on some new conquest or building a cathedral; fortunately for us they decided on the latter. Where to place it, however, was another matter. The church of St. Mark's was built, as I have said, between the Ducal Palace and the church of St. Theodore, 16 feet from the former, 32 feet from the latter. Its west front projected quite as far beyond the Ducal Palace as was thought desirable, and a further extension on the east side would only have increased the church to too great a length. The result of the deliberations would appear to have been to pull down a portion of the Ducal Palace on one side and the church of St. Theodore on the other, and to extend the building north and south by the addition of huge transepts. It was here that the Greek architect came in apparently, who showed them that by following the model of the church of the Holy Apostles at Constantinople, they would retain portions of the walls and, without increasing the length, obtain an immense space in the centre. Early records state that the reconstruction was based on the church of the Apostles at Constantinople; this church, however, was pulled down in 1464 by Mohammed II. to build a mosque on the site, so that we have only the description of this church given by Procopius, the historian of Justinian's time, to go by. Now Procopius states:—"In ancient times there was one church dedicated to all the Apostles, but through length of time it had become ruinous, and seemed not likely to stand much longer. Justinian took this entirely down, and was careful not only to rebuild it, but to render it more admirable both in size and beauty. He carried out his intention in the following manner. Two lines were drawn in the form of a cross, joining one another in the middle, the upright one pointing to the rising and setting sun, and the cross line towards the north and south wind. These were surrounded by a circuit of walls, and within by columns

placed both above and below. About the middle point there is a place set apart which may not be entered except by the priests, and which is consequently termed the sanctuary. The transepts which lie on each side of this, about the cross-line, are of equal length, but that part of the upright line towards the setting sun is built so much longer than the other part as to form the figure of a cross. That part of the roof which is above the sanctuary is constructed like the middle part of St. Sophia, except that it yields to it in size, for the four arches are suspended and connected with one another in the same fashion; the circular building standing above this is pierced with windows, and the splendid dome which overarches it seems to be suspended in the air. In this manner the middle of the roof is built; but the roof over the four limbs of the church is constructed of the same size as that which I have described over the middle, with this one exception, that the wall underneath the spherical part is not pierced with windows." Now Procopius was not an architect, therefore we must read between the lines of his description, and when he says the church was surrounded within by columns placed both above and below, he is evidently referring to the columns of aisles and triforium galleries, as in St. Sophia. If that reading be accepted, then the only differences between St. Mark's and the church of the Apostles are—first, there is only one range of columns, viz. in the lower storey, which carry the gallery, and the upper range of columns in wall with windows above, as in St. Sophia, is omitted, the windows being in the outer wall above the aisles; secondly, there are windows at St. Mark's in the four other domes; thirdly, the galleries were replaced by narrow passages in the thirteenth century. Otherwise he might have been describing St. Mark's plan: a Greek cross, with the west end a little longer, dome over the crossing, and four other domes over the limbs, viz. nave, transepts and choir.

Now I have already pointed out that Partecipazio's church, restored by Orseolo, was erected between the church of St. Theodore and the Ducal Palace, 32 feet from the former, 16 feet from the latter; and it is here that the late restorations of St. Mark's have been of such value in testing the validity of the new theory. The wall which separates the chapel of St. Isidore from the north transept, when stripped in 1887 of its marble casing showed a bare surface of bricks, blackened by exposure to the weather, which proved it to be an ancient wall; and, further, a window with stone dressings was found, 9 feet from the ground, fitted with an interlaced wrought-iron grating on the side of transept, and on the other side with the jambs splayed off. This was one of the windows which lighted the south aisle of St. Theodore. The outside of the north wall of nave (now the south side of the north atrium) was exposed in 1885, and it was also found to have been blackened by exposure to the weather, showing it to have been the ancient wall of Partecipazio's church, 76 feet long and 26 feet high. On the south aisle the antæ of the original narthex was discovered, so that it is fair to assume that the south wall of nave below the baptistery and the south aisle, as also the west wall at back of atrium, are both the ancient walls of the original church. If any further proof were required, I think it would be found in the fact that, where an old wall existed, columns were erected against it to carry the vaulting, as in the atrium and baptistery, whilst on the opposite sides it was carried on the wall.

Cattaneo was of opinion that the early church did not extend to the same length as the present cathedral, basing his theory on the existence of a low crypt on the west side of the present crypt and raised choir. Since his death, however, it has been ascertained that this substructure was not a crypt, but was built to carry the floor of the whole structure, and exists throughout, its object probably being to keep the church dry. It is the sinking in the pockets of the arches of this substructure which has led to the wavy surface of the mosaic floor. I had an opportunity in August last (when portions of the pavement in south transept had been taken up to restore the vaults) of tracing out the lines of the arches crossing the church and of the foundation walls of the original basilican church. The west end of the new crypt, therefore, is the same as that of the old one; how far it extended to the east is still a matter of conjecture, but as Cattaneo himself allows, the length of a chancel, including the apse, usually varies between one-third and two-fifths of that of the central nave, and as that is the actual proportion of the existing chancel, there is fair reason to suppose that the inside walls of the three apses are in the same position as that occupied by the original church.

In the reconstruction of the new church, therefore there were certain restrictions, firstly, in the width of nave and aisles, the old walls being retained, and secondly, a limitation in the projection of north and south transepts, as the south wall of St. Theodore and the inner wall of the Ducal Palace were utilised. These limitations have apparently led to a diminution in the diameter of the domes on the north and south transepts, which are 33 feet as against 42 feet, the diameter of the nave dome, and a similar diminution in the choir dome, so as not to interfere with the central apse. The central dome is egg-

shaped, being 42 feet from north and south and only 41 feet from east to west.

Now Contarini died in 1070, and his successor, Dominico Selvo, is said to have commenced the embellishment. It follows that the main structure must have been completed, including the atrium, by that date, and Cattaneo is of opinion that owing to the immense resources they had the task was a possible one; but the structure thus completed bore a very different aspect to the St. Mark's we now see. Externally it was a plain brick building, like the present south transept, its decoration being confined to the brick arches, which with their deep voussoirs have a certain decorative character, to small niches with marble shafts and capitals, to roundels, corbel tables and string-courses. I have endeavoured to make a drawing reproducing the original façade, my conception being based, first, on the walls of the existing structure; secondly, on the reproduction given in Ongania's work of those portions of the ancient structure which were exposed and copied by Mr. Scott during the restoration and on Cattaneo's description. In front of the atrium were five rectangular niches and two small ones, one on each side of the central niches. The extrados of the arches spanning these niches was exposed and covered with lead, as those of St. Saviour at Constantinople. The piers supporting them were decorated with semicircular niches with small marble capitals and brick shafts, and roundels and blind niches above. The gables of the upper storey, as also of the transepts, were also semicircular, but at a lower level than those of the existing transept, about 2 feet 6 inches. This accounts for the indented brick circular string-course which exists in the south transept, and which originally ran round the coping, now raised about 2 feet 6 inches. The existing dome terminals are in timber covered with lead; they were added in the thirteenth century, so that originally the domes were much lower, and the extrados of the arches of the windows were probably exposed, as they are in all Greek churches. I could find no evidence of this, as all the windows have jambs, some of late date, possibly thirteenth century, also the upright portions of the drum have been refaced and the drums raised. As regards the exterior, it is certain that many of the capitals, columns, balustrades, jambs and lintels were taken from older structures, and that the original church and that of St. Theodore furnished at least a portion. Examples of all periods are found in the present church, including Roman capitals and those of the fifth century onwards. The decoration of the exterior took two centuries to carry out, not including the fourteenth-century florid work of the upper gallery and pinnacles, and every vessel which set out for the East was required to bring back columns, capitals and marbles of all kinds to enrich the great church which, in this respect alone, is absolutely unique. There is no example in the East which suggests a precedent for the singular decoration of the exterior of the atrium with rows of columns on two storeys, and the only parallel instances I am acquainted with are those of the churches of St. Gilles and of St. Trophime at Arles, of the eleventh century, where columns carrying architraves are set close together with figures between; and here the idea was certainly taken from the Maison Carrée at Nîmes, except that they borrowed the idea of a peristyle for the purposes of a wall decoration. To go through the various portions of the cathedral would be beyond the limits of my paper, and would require two or three evenings instead of one. In 1150 the galleries were reduced in width to give increased light to the aisles and chapels. The great arch outside the chapel of St. Isidore was erected in the thirteenth century. The baptistery was decorated with marbles and mosaics in the fifteenth century, but the columns, capitals, with dossier and vault, date from the early structure. The chapel of St. Zeno was originally the entrance to the atrium from the south porch, there being also an entrance in the north porch known as the Porch of Flowers (Porta delle Fiori). The vault of the nave and aisles extends over the west atrium. On the south side two bays project, viz. over the south porch and the entrance to baptistery, and these formed, according to Cattaneo, open loggias; in the former is a semi-spherical vault intended, doubtless, to be decorated with mosaic. It is an interesting example of brick domical construction of the period. On the north atrium are four chambers all vaulted with domes. All these are parts of Contarini's building.

It is only necessary for me to draw your attention to the photographs on the walls (which illustrate a portion only of the treasures of St. Mark's), and you will be able to judge for yourselves of the enormous influence which such work was likely to exercise on the development of the Lombard style, and that not only in Venice herself but in all those towns with which by sea or land she was in constant communication. Mr. Jackson's work on Dalmatia and Istria will show you how great an influence was exercised in Venice by the Byzantine churches in those countries, a debt which was repaid afterwards when in succeeding centuries they were ruled by Venice. If I have not mentioned Dalmatia and Istria specifically before it is because I have included them generally with Eastern countries. But as to the influence of St. Mark's, so enamoured were the Venetian artists with Byzantine work that down to the Renais-

sance period they frequently copied it with such accuracy as to deceive all but experts, and many of the wells reported to be eleventh or twelfth-century work are, according to Cattaneo, reproductions of the fourteenth and fifteenth centuries. There is a favourite string-course with leaves turned over, the design of which comes originally from Constantinople, in Monas-tes-Koras (Kakriyeh Djami), which is found throughout St. Mark's, in St. Donato, Murano, in the early palaces of the Grand Canal, which I came across in a palace at Ancona, and I have no doubt could be found elsewhere, which testifies to the general favour which it met in the cities of North Italy.

The cathedral of Torcello, an island about eight miles to the north of Venice, was founded in the seventh century, and although reconstructed since, still possesses some of the Byzantine capitals which were used up in the first church. Of this church the central apse and fragments of the baptistery still exist. In 864 the external walls would seem to have been rebuilt, and two minor apses added, one on each side of central apse. A crypt was then formed under the latter, the floor of the apse raised, and the range of marble seats and bishop's throne erected. To this period also belongs the rich interlaced work of the west doorway. In 1008, when the son of Doge Orseolo became Bishop of Torcello, the nave arcade was rebuilt, and thirteen of the eighteen capitals date from this period, as also the marble enclosure to the choir, the panels of which are Byzantine in treatment if not actually carved by Greek artists.

By the side of the cathedral is the church of St. Fosca, originally a basilican church of the ninth century, but modified and partly rebuilt in 1008. There is a special interest attached to the changes which then took place, because they may possibly have suggested the rebuilding of St. Mark's on a Byzantine plan. The model, however, on which it is based is one of the later type of Greek churches, in which the central dome is carried on detached columns. They had, however, a very vague idea how to build pendentives, and still less conception of what the thrust of a dome was likely to be, and I should doubt if it was ever attempted. By throwing small arches across the angles they managed to arrive at the circular base for the dome, and then probably left off, the church now being covered with a timber roof, the exterior of which has the appearance of being the original covering. The capitals of the interior are fine examples of Byzantine Corinthian. Those of the octagonal arcade are barbarous attempts to invent new forms with Byzantine ornament.

The central apse, which was rebuilt in 1008, is polygonal externally, which shows its Byzantine origin. Underneath the cornice we find the earliest example of these triangular panels, which were afterwards adopted in the church of St. Donato, in the island of Murano, two miles from Venice—with this exception, that in St. Fosca the triangular recesses are filled with decorations in stucco, whilst at Murano, being much closer to the eye, they are filled with marble incised panels. There is no doubt that these panels, which are only incised and of simple execution, were produced to fit the places, and not the converse, as is suggested by Fergusson. The church at Murano was built towards the close of the eleventh or beginning of the twelfth century, and possesses many fragments of interlaced pattern slabs of the eighth and ninth centuries. The two large slabs which stand between the upper arcade at each end of the west part bear so great a resemblance to the panels of the choir at Torcello that they may have been carved by the same Greek artists. The apse of Murano is also polygonal.

The position of Ancona opposite the Dalmatian coast, and its facilities of communication with Venice by sea, would naturally bring it within the sphere of Byzantine influence. I have been quite unable to get any information as to the history of the churches here, so that it is difficult to decide their dates. The three churches of interest, so far as my subject is concerned, are the Duomo, dedicated to St. Ciriaco, St. Marie in Piazza, and St. Marie Misericordia. The latter is a square church on the plan of a Greek cross, with dome in centre carried on four piers. There is no Byzantine detail except a pulpit of the eighth century, evidently carved by native artists who attempted to copy Byzantine work.

St. Marie in Piazza possesses an extremely rich west façade, with an unusual screen of arches one above the other carried by small shafts. The wall behind these has been panelled with marble slabs carved with interlacing Byzantine ornament, which comes irregularly behind the shafts. I came to the conclusion on the spot that, in imitation of St. Mark's at Venice, the architect of the first church inlaid the upper portion of his façade with marble slabs from some more ancient building. At a subsequent date, finding that they were being outdone by St. Mark's, and being unable to command the supply of marble columns and capitals enjoyed by the Venetian Republic, they employed a Lombardic artist to decorate the front in his own way, and we have in this remarkable decoration the result of his efforts. The Byzantine leaf cornice is found both inside and outside of the church, which I should assign to the end of the eleventh century or beginning

of the twelfth, and the arcading fifty to seventy years later. Subsequent additions have much altered the upper part of the façade, and the aisles have been raised and partially rebuilt.

The Duomo or cathedral is variously ascribed to the tenth or eleventh century, but it contains Byzantine capitals and other treasures of much earlier date. I should ascribe it to the end of the eleventh century, and the plan seems to me to have been taken from St. Mark's of Venice. It is in the form of a Greek cross (not including the extension of choir at a later date), and it consists of nave, transepts and choir, all with side aisles, and a central ribbed dome of twelve sides, carried on a drum, and pendentives of the twelfth century. The nave, transepts and choir are all covered with timber roofs, and there are crypts under both transepts and choir. The capitals are all Byzantine with dossierets, and in the balustrade of the parapet to south transept there are eight marble slabs with incised work, originally inlaid with mosaic, four of which must, I think be of Greek workmanship, as they are carved with birds and animals which have their prototypes in Greece. The inscriptions, however, on other examples stored in the crypt are in Latin, as also those on the figures or face of the slabs or parapet to south transept and others encased in the façade rebuilt in the thirteenth century. The inlaid ground of those in the transept had all been taken out, but in the crypt one of the slabs still retains its cement inlay, with three or four pieces of glass, which suggested that they were tesserae from which the gold surface had been chipped off. I have tried in various ways to obtain more information respecting these slabs, but in vain, and as I unfortunately arrived in Ancona two days before some fête, and before I left the whole church was enveloped in red drapery and the windows covered with veils, I was unable to copy any of the inscriptions.

Owing to the paucity of examples in Lombardy prior to the eleventh century, we are unable to trace the earlier developments of what is termed the Italo-Byzantine style, to distinguish it from the Romano-Byzantine and the Lombardo-Byzantine phases. The few churches which remain and to which I have already referred, of the ninth and tenth centuries, still retain the simple basilican form with timber roofs. Early in the eleventh century, however, a new and important element is introduced in the desire to erect churches the construction of which should be fireproof, in other words to vault the nave and aisles of their churches. This had for centuries been done in the East, in fact, after the erection of St. Sophia all the churches were vaulted. De Dartein does not recognise any Eastern influence in this respect; at the same time he is bound to allow that it may have inclined the architects of the West to make an attempt in the same way. The domical form given to the webs of all the Italian examples is so marked and is so widely different from the early Roman vaulting, which at that time still remained throughout the country, that it is only fair to suppose that the early Italian builders may have profited by the lesson set them in the East. Be that as it may, it is quite certain that with the introduction of vaulted naves an altogether different plan of pier or support was required in the place of the ordinary basilican column, and the favourite Byzantine composite or Corinthian cap could not be used up again. They were obliged, therefore, to invent and carve a new combination of capital which should meet the requirements of the compound or clustered pier.

The dossieret was given up, or rather its place was taken by an abacus of less height decorated with interlaced work or scrolls, or leaf ornament of various kinds. It had no longer the same great projection, for here we return again to the old Roman system in which the arch or architrave or wall above is in the same plane as the pier or shaft below the capital.

In the Byzantine capital animals or birds are rarely carved, the eagle, the lion, the lamb and the ram's head occasionally taking the place of the volute, and supporting the angles of the abacus; but are probably not found in more examples than 3 to 5 per cent. In the Italo-Byzantine capital it is almost the reverse. Animals and monsters and figures of all kinds decorate their capitals, relieved with interlaced work of various patterns. Though bold and vigorous, the carving of these animals is very barbaric, and it is only when they reproduce those animals or bird forms which occur occasionally in Byzantine capitals that the treatment is properly conventionalised and good. In fact, the finest capitals of the eleventh and twelfth centuries are those in which the artists have felt the influence of Eastern work and tried to reproduce it.

In the church of St. Michele, at Pavia, carved work of three periods may be traced. First, the early Lombardic work of the eighth or ninth century—animals of barbaric type taken from an earlier building and built into the eleventh-century façade. Second, Lombardic Byzantine panels, which are utilised in the jambs of the portals. And third, the mingling of these two elements in the carved work specially executed for the church. The same is observable in the church of St. Ambrogio at Milan, where the jambs and arch-moulds of the west doorway would seem to have been taken from the earlier ninth-century church. Some of the carving in this church

seems to be of earlier date than St. Michele, but I am inclined to think that is due to the existence of much Roman work in the town. In St. Eustorgio and St. Celso, also in Milan; in St. Pietro in Celo d'Oro at Pavia; SS. Pietro and Paolo, Bologna; St. Savino at Piacenza; the cathedral of Parma, and other churches of the twelfth century, we find a magnificent series of capitals, showing a wonderful fertility of design, and, as time progressed, of knowledge and finish of execution. One of these churches, St. Pietro in Celo d'Oro, is dated 1132, and in allowing fifty years earlier for the first developments of the style in St. Ambrogio, Milan, and St. Michele, Pavia, and, perhaps, twenty to thirty years later for St. Celso at Milan, we should probably not be far wrong, though some authorities, among them M. de Dartein, are inclined to give a much earlier period. Towards the close of the twelfth century the Byzantine influence dies out, and in the baptistery of Parma there is scarcely any trace; the concave sections given to the leaves and tendrils are replaced by convex, and interlaced work is seldom employed.

The Byzantine influence in Venice, Padua, Vicenza and Verona lasted a much longer period. The church of St. Antonio at Padua, built between 1232 and 1307, is the most notable example, but only in the plan and the main features of the building, in which they have attempted to reproduce a new version of St. Mark's. It is in the form of a Latin cross, and is crowned with eight domes.

Along the Grand Canal in Venice are the remains of seven or eight Byzantine palaces of the eleventh, twelfth and thirteenth centuries. The most remarkable of these is the Fondaco dei Turchi, a building which has lately been entirely restored, I might say rebuilt, none of the ancient marbles being retained. I fortunately purchased on my first visit to Venice two photographs of the building in its original decayed condition, but of which there remained sufficient sound material to have been embodied in the restoration. The Venetians, however, wanted to have a new building, and allowed their architect to exercise his ingenuity in the design of an upper storey or series of gables, which I am sure never existed in the old building. In the Casa Loredan, Casa Farsetti and other palaces we find the original arcade and fenestration which formed the foundation of what is known as the Venetian Gothic style, such as is found in the Ca d'Oro, the Foscari and other palaces. The arches of these Byzantine palaces are all stilted, and in their hood-moulds they employ always what is known as the Venetian dentil, but which is first found in St. Sophia of Constantinople. This dentil is found in all the Venetian palaces down to the end of the fifteenth century, and also at Padua, Vicenza and Verona. All the capitals which carry these arches are of Byzantine character, doubtless copied by the Venetian artist from those of the models in St. Mark's, and the leaf cornice to which I have directed your attention reigns throughout.

The Byzantine influence in Lombardy, I have said, dies out towards the end of the twelfth century. This, however, is not the case in Venice and in the towns which came within her influence. To go further, however, would take me beyond the period I have selected, and would certainly put too great a strain on the indulgence with which you have listened to my long paper.

I can only express the hope, in conclusion, that I have been able to lay before you clearly, 1st, the essential characteristics of the Byzantine style; 2nd, the sources through which the influence of that style penetrated into Italy; and 3rd, the principal results of that influence. If, beyond these three objects, I have been able to awaken your interest in the high decorative qualities of the Byzantine style, in the variety and beauty of its carved capitals and screens, and last, but not least, in the reticence and simplicity of its masses, I shall not altogether have failed in the object of my paper, although I have not gone to the headquarters of the style. For our immediate purpose as revivalists of principle in architectural design, the unconscious adaptation by a nation of a foreign style may possibly teach us lessons which the study of the originals would at first fail to impart to us.

CLIMATE AND ART IN EGYPT.

PROFESSOR FLINDERS PETRIE, in his lecture at University College on Saturday, said the Egypt of the early monuments was a mere strip of a few miles wide of green, amid boundless deserts, and beneath a sky of the greatest brilliancy; a land of extreme contrasts of light and shadow, of life and death. These conditions were reflected in the art. On the one hand was the most massive and overwhelming construction, and on the other the most delicate and detailed reliefs. On one hand the most sublime and stolid statuary, on the other the course and accidents of daily life freely treated. On the one hand, masses of smooth buildings that far outdo the native hills on which they stand, gaunt and bare, and on the other the vivid and rich colouring in the interiors. Against such a back-

ground of hills and precipices, hundreds of feet high, no architecture but that of Egypt would be able to assert itself. In consequence of the climate also Egypt is a land of great simplicity of life. Where the only necessary is a few handfuls of grain or lentils in the day, where clothing is an encumbrance, and the shadow of a palm tree is enough by day and by night during most of the year, life is reduced to the fewest elements. And this simplicity is reflected in the early art, which is only relieved from bareness and poverty by its majestic and vigorous spirit. This extreme of simplicity is especially seen in the oldest buildings, the temple of Sneferu, at Medum, and that of Khafra, at Gizeh. Another point in which we must look to Egyptian nature, in order to understand their art, is in the drawing of the figures. Most Europeans condemn their drawings as an incongruous mixture of side and front views. This is not the real case. Their drawings are three-quarter views omitting the much foreshortened parts. In an actual photograph of an Egyptian boy, taken without any posing, may be seen the side view of both knees in kneeling, one raised above the other, the whole breadth of the shoulders, both arms apart, the profile (with some part of the offside of the face), a full view of ear, and yet a full eye. There is here every element which is set down as impossible by those accustomed to more rigid beings, but which is true to nature in the Egyptian. The early statues agree very closely in the general character which they show, although the individuality of each is clear. There is a full, firm, sane, able look, great decision and vigour, and no trace of cruelty, pride, or excitement. They appear as one of the noblest races that ever existed, and quite fitted for the gigantic new ideals, which founded the character of Egypt as one of the greatest factors in human history. In all their work, whether in architecture or sculpture, the ideal of this earliest art is gigantic work which impresses us the more by its very simplicity and restraint, and the absence of any attempt to seek an effect which is not solidly produced. We admire the action, and not merely the intention. We have no need to say "this man's ideals were greater than his means," for nothing is attempted which is not perfectly accomplished. Their simple grandeur was a challenge to all the feebler races which have followed, each wondering at that which they could not imitate.

CITY IMPROVEMENTS.

AT the meeting of the City Commission of Sewers on Tuesday—the last during the existence of the present Commission—Mr. Alderman Treloar, the chairman, explained the work done by the Commission during the past year. He said that among the improvements carried out the completion of the widening of Ludgate Hill was the most important. The total length of the thoroughfare was 850 feet, the width, formerly 47 feet, was now 60 feet, and the total net cost to the City had been 230,000*l*. Although that great undertaking was begun with the concurrence of the Metropolitan Board of Works and on the understanding that the Board would contribute one-half of the amount expended on it, the London County Council had repudiated that arrangement, and had hitherto declined to pay one penny towards the cost. Many other improvements of more or less importance had been completed or begun. During last session an Act was passed enabling the Commission and the County Council to make a thoroughfare 40 feet wide between Middlesex Street and Bishopsgate. In 1882 the promoters of the Regent's Canal, City and Docks Railway Company scheduled the Golden Lane site, intending to appropriate it as a terminal station, and the price agreed to be paid to the Commission for the site was 80,598*l*. The scheme was abandoned, and after nine years' negotiations an arrangement had been effected by which the Commission had regained possession of the land, and received 42,000*l*. as representing depreciation of value of land, interest on purchase-money, loss of rates, &c. Great credit was due to the solicitor (Mr. E. A. Baylis) for that satisfactory termination. Due attention had been paid to undertakings before Parliament, and when necessary steps had been taken to protect the rights of the citizens. The Central London Railway Bill necessitated a great deal of consideration, resulting in the Commissioners agreeing, subject to certain conditions, to a scheme for an underground station, with subway approaches, opposite the Mansion House. Access to the station would be by two staircases, formed in the footway in front of the Royal Exchange, and also by six others close by. Connected with those staircases would be subways enabling not only the railway passengers to get to and from the station, but the public generally to cross beneath the roadway at that spot. The Bill had received the royal assent. The artesian well at the artisans' dwellings had been completed. It was hoped that in the future the ample supply of water from this source might be utilised for the inhabitants of the surrounding district. The amounts which could be and were legally charged by the water companies were most excessive, and it

was felt that the Commission should in every way endeavour to bring about some alteration in the present system. He was told that in some cases the amount paid as water-rate was so excessive for the quantity used that it would have been cheaper to have used champagne. Great progress had been made with electric lighting, and, indeed, the street lighting in all the main thoroughfares was virtually completed. It was proposed to light the side streets with glow-lamps. He regretted that as regarded private lighting they were much behind, and every effort should be made to press the matter on. The City of London Electric Lighting Company, when laying down their tubes, took the opportunity in a very enterprising manner of placing other tubes side by side with them, with the view of ultimately using them for telephonic purposes, but they could not so use those extra tubes without the consent of the Commission. Negotiations were now in progress with the view of obtaining from the company some practical advantage for the ratepayers before they gave their consent. Mr. Treloar said he believed that one of the chief duties of any municipal body was street improvement. If further improvements were not from time to time made the City would become inadequate to the requirements of its business. But the public should know that the improvements were for the most part made for the benefit and convenience of the entire metropolis and not alone for the City. There was not a part of London which did not add its quota of traffic to the 1,186,000 people and 92,000 vehicles entering and leaving the City every day. It should also be pointed out that the City had to pay about one-eighth of the amount expended by the London County Council on improvements outside the City.

GENERAL.

The Spring Exhibition of the Manchester Academy of Fine Arts will be opened on February 21 with a *conversazione*. Space has been set apart for architectural drawings and works in black-and-white.

The Dunfermline Art Exhibition closed on Saturday, having been open during seven weeks. Up to the time of closing, pictures to the value of 985*l*. had been sold, as compared with 871*l*. paid at the last triennial exhibition.

The Permanent Collection at the Manchester City Art Gallery has been reopened to the public. The collection now occupies the five galleries on the south side of the building and the chief entrance-hall.

The Annual Prize Distribution of the Clapham School of Art takes place this (Friday) evening, when Mr. P. H. Calderon, R.A., will preside.

A Partnership has been entered into between Mr. Reginald G. Pinder, F.R.I.B.A., M.S.A., of Bournemouth (of the late firm of Kemp-Welch & Pinder), and Mr. J. F. Fogerty, B.E., son of the late William Fogerty, F.R.I.B.A., of Dublin.

The Ramsey School Board have instructed Mr. J. W. Start, F.S.I., architect, of Colchester, to prepare plans for the enlargement of their Parkeston Schools by building a new girls' school for 200, and enlarging the boys' by 100 places.

The Ancient Parish Church of St. Peter, at Lusby, near Horncastle, has been reopened after restoration, under the direction of Mr. Ewan Christian.

The Partnership between Messrs. T. Worthington & J. G. Elgood, architects, in Manchester, has been determined, owing to the recent severe illness of Mr. Elgood. The practice will in future be carried on by Messrs. T. and P. S. Worthington under the style of "Thos. Worthington & Son."

The New Buildings for the parish of All Saints, Plymouth, were opened on Sunday last. Mr. Edmund Sedding was the architect, and Mr. P. Blowey the contractor. The work cost 1,300*l*.

"Pemberton's Parlour," one of the landmarks of Chester, occupying a prominent position on the North Wall, though to outward appearance perfectly sound, has collapsed, and was utterly destroyed, owing probably to the effects of the frost. The tower is believed to belong to the Norman period, and on an inscribed panel it was set forth that it and the adjacent portions of the walls were repaired by the aldermen and murengers in 1702.

A Lecture was given by Mr. T. H. Thomas on "Pre-Norman Stonework in Wales," at the last meeting of the Bath Literary and Philosophical Association. The address was some explanatory notes of a series of photographs of descriptive and ornamental stones at present found in Glamorganshire, which were in fact almost the only existing remains of pre-Norman architecture in that county.

The Local Government Board have held an inquiry at the Town Hall respecting an application of the Bilston Township Commissioners for permission to borrow 2,500*l*. for fitting up and carrying out improvements at the new public baths. There was no opposition.

The Architect.

THE WEEK.

THE decision which was given by Lord COLERIDGE and Mr. Justice CAVE on Wednesday will not satisfy district surveyors, but it will have the effect of preventing the Building Act from becoming more oppressive than it has been hitherto. The circumstances were novel. District surveyors are generally supposed to take cognisance of every intention to erect any sort of structure that can be interpreted as a building. But in West Hackney a house was completed without the knowledge of the district surveyor. Notice was given to carry out alterations in it, and, as the builder declined, he was summoned. He maintained that the surveyor's notice arrived too late; but the magistrate did not take that view, and made an order. The builder appealed. There is no doubt the builder should have lodged the requisite notice; but, according to Lord COLERIDGE, it is the surveyor's duty to be independent of such a notice. His business is to go about his district constantly, and keep his eyes open. The whole machinery of the Act ceased when the building was completed. There might be a sale of the building, and the builder might have retired or died. The responsibility for lapses was therefore temporary; for to suppose that proceedings could be taken afterwards would, according to Lord COLERIDGE, be equivalent to charging the Legislature with an intent to do an outrageous injustice. As district surveyors have too much interest in buildings, they generally take care that the provisions of the Act are carried out in detail; but the decision in the Queen's Bench makes it plain that there are more limitations to the exercise of their office than had been supposed.

WE have already commented on the action which was taken by a contractor for sewers at Workington. He declined to carry out a part of the work in moist ground in the way prescribed by the specification. As his proposal to execute the work in another way was not adopted, he threw up the contract. Afterwards he claimed 7,000*l.* for work already done, and damages, but as the surveyor did not give a certificate the Corporation declined to pay. When the case was tried before Mr. Baron POLLOCK and Mr. Justice HAWKINS, judgment was given for the Corporation. The contractor appealed, and the case was heard in the Court of Appeal on Wednesday. As might have been anticipated, there was no reversal of judgment. The right of the borough surveyor to withhold a certificate was the same as that of any engineer or architect in dealing with a contract. The contractor accepted the surveyor as arbiter of what was to be done. If any alterations were to be introduced, an order for every one of them was to be signed by the town clerk. The position of the contractor was not affected by any defect in the plans. Let it be granted that an impracticable method of dealing with the moist ground was proposed, the contractor was still as much bound to obtain a certificate before he sought payment. As we said before, it was the contractor's business to examine the ground he was to excavate, and in this, as in other matters, we anticipated the judgment of the Court of Appeal. It is no doubt hard on the contractor to have a large sum of money kept from him, and the Workington Corporation can now afford to be generous in dealing with him; but as he agreed to depend on the will of the surveyor, he cannot escape the consequences, however disagreeable. Although our opinion of the case has been confirmed, it is right to say that we were not aware that an appeal was contemplated.

AMONG the experiments which are made with the object of determining the density of the air owing to the population of districts, those which Mr. JOHN AITKEN described to the Royal Society of Edinburgh on Monday should be noticed. He did not use a dust counter, yet he was able to make some curious discoveries on the hazing effects of atmospheric dust, or rather the hazing effects of the products of combustion. The observations extended over a period of two years at Falkirk, which may be considered as the dividing line between the populated and the

sparsely-populated districts of Scotland. If lines were drawn north and west from Falkirk, the quadrant between these lines would include almost the whole of the thinly-populated districts. The amount of haze had been based on estimates founded on the visibility of the hills seen from Falkirk. The result of the mean of about 200 observations was that the limit of visibility increased with the increase of dryness, that the transparency of the atmosphere varied with the direction of the wind, and that the direction of greatest transparency was the direction of the northerly and westerly winds—that is, the winds blowing from the sparsely populated regions; while the direction of least transparency was the direction of the southerly and easterly winds—that is, the winds blowing from the thickly populated regions. Generally speaking, the air was six to ten times as clear with a northerly or westerly wind as it was with an easterly or southerly wind, for the same degrees of humidity. In other words, Falkirk air would be six to ten times more transparent if there were no inhabitants in the district. The extreme limit of visibility for the most transparent atmosphere observed Mr. AITKEN estimated at about 250 miles. The observations may be accepted as fairly representative of the haziness of similar districts, but on investigation some differences would probably be noticed. It is a pity the air loses transparency, but there is no help for the change. Towns cannot be demolished in order that nature may be restored to its original state.

MANCHESTER has contributed so much to the Ship Canal, it might be supposed that the citizens would not seek to increase their burthens. But the announcement that the historic Trafford Park Estate is in the market has created a desire to possess it. There are nearly 1,200 acres, and as the property adjoins Manchester, it would be an invaluable aid to the health and recreation of the inhabitants. At the meeting of the Council on Wednesday, they moved:—"That a special committee be appointed to make an exhaustive investigation into a proposal for acquiring the Trafford Park Estate for the city of Manchester, and to prepare and present to the Council a special report, with a view to advising the Council thereon." The motion was adopted with a single dissident. Unless the owners become over-avaricious, it may be assumed that the property will be secured against all competitors.

THE Leeds School Board would appear to be destined to cause dissatisfaction among local architects, although the designing of schools is confined to them. Leeds is one of the few towns in which there is no Board school by a London architect. At present there is a grievance over the competition for a school to be erected in Darley Street. Only architects who practised in Leeds were allowed to take part in the contest. The drawings were without names or mottoes. The first prize was awarded to Mr. J. M. BOTTOMLEY. Fortunately for himself he set up an office in Leeds a short time before the plans were sent in. Mr. BOTTOMLEY was therefore legally entitled to be considered a local practitioner, and it is not likely the School Board will treat him as if he were a stranger. But the transaction indicates the ease with which the most saving conditions can be defeated in architectural competitions.

IN a letter to the *St. James's Gazette* on "Insanitary London" Mr. ERNEST RÜNTZ offers the following recommendation:—"Let the London County Council apply for an Act to enable them to raise loans—say 'Municipal Mortgage Loans'—having for their object the advancing to house-owners of necessary sums of money for the purpose of the revision of imperfect drains, and to include in such Act powers to enforce the same. This would enable the poorer owners to comply with the compulsory regulations at a minimum sacrifice, if the advances were repayable in small amounts by their being spread over a number of years, upon a repayment system similar to but lower in the scale of interest than building societies. The loan could be issued as a 3 per cent., and the money advanced at 3½ per cent. to 4 per cent. The profit on the difference would pay the cost of the machinery necessary in carrying out such a transaction."

TECHNICAL EDUCATION AND THE LONDON COUNTY COUNCIL.

THE Local Taxation (Customs and Excise) Act of 1890 makes available for aid towards technical instruction in the metropolis a sum of money that would elsewhere serve for the education of a kingdom. Unfortunately there is little hope that aid of the kind will be made to yield all that it ought to do among us. The South Kensington incubus contrives to gain hold of most projects for education outside the universities in this country, and renders them almost powerless for good results. When it was settled that the clerks of the Department were to decide upon the subjects which were to be taught and to be the judges of the schools, the fate of technical education was determined. It was doomed to be as costly a failure as the education in art, for which those officials are responsible.

It is no wonder the London County Council, like other municipal bodies, hesitated about entering on the road to ruin, or that the money from Customs and Excise has been utilised for payment of works in London instead of for amateurish experiments in technical education. At the same time the Council have felt that they were expected to act in the spirit which inspired legislation on the subject, although it failed with arrangements for administration. Accordingly the County Council appointed a special committee on technical education. One of the consequences is a comprehensive report, which has been prepared by Mr. LLEWELLYN SMITH, M.A., B.Sc. It describes the result of an inquiry he made into "the wants of London with regard to technical education, the existing provision to meet such wants, and the mode in which the county could best promote technical education," under the Acts of 1889, 1890 and 1891. The report is most creditable to the author.

It is needless to say that at the present time London possesses a great many establishments which are supposed to impart technical education. They are not all successful, and there is no doubt that the majority of students are not of the kind which the founders wished to attract. It is flattering to professors when the sons of wealthy manufacturers are glad to be instructed by them at rates that are almost nominal; but those youths could obtain training elsewhere without any loss to the State. Able professors always prefer to have the best materials to work upon, and in some of the higher technical institutions it is well known that every comer is not welcomed. Rejected candidates are at liberty to go elsewhere, but it should not be forgotten that the London student who has commenced any branch of industry is a judge that is not easily satisfied. In anything which touches his own work, however remotely, he can discriminate between competency and inexperience. Unfortunately, most of the teachers that appear in technical schools have had no experience in the application of science to industry. They have been crammed with what passes for science under the Science and Art Department, and that perilous stuff is not convincing for a London artisan or apprentice. Mr. SMITH, in his report, says that in the technical classes of the metropolis he could discover only 24,000 students, whereas there ought to be at least 140,000; but when the character of the instructors is considered, it is a wonder there are so many.

County councils, and everybody who may desire to make education available, should bear in mind that competent teachers are the foremost necessity. Commodious buildings and generous rewards are advantages, but they cannot compensate for deficiencies in the masters. The spirit which in the Middle Ages made men brave the perils of land and sea in order to derive wisdom from an expert, who might have to give his lessons in a wood through want of a classroom, is not extinct. Students are still willing to go in quest of knowledge, but they have grown more sceptical than their predecessors, and will not weary themselves to attend on counterfeits.

The eagerness of the London student to acquire knowledge when he knows it is obtainable of the right sort is suggested by the tables of the report. At the Polytechnic, where experience is a condition precedent for teachers, we find there are no less than 348 students of various ages

in the class of building construction. During the session 1891-92 there were 88 between twenty and thirty years of age, and 133 over thirty years attending the building classes. In the carpentry class 80 of the students were over twenty years of age, and among the plumbers 41 were over thirty years. The City of London College, which has also the reputation of having practical men for teachers, has 116 students of building construction. The Architectural Museum, on the contrary, could only attract three students to the class of building construction, although, owing to Mr. F. BROWN's presence, there were no less than 368 in the classes for figure-drawing and painting. Why should the Highbury Institute have 64 students of building construction, with 189 for drawing, while the Camden School has only 2 in the former and 204 in the latter? The Working Men's College has some earnest supporters, but there are only 15 students of construction. The Hyde Park and Bayswater School counts 5 in the class of construction, and 164 in the drawing classes; while the Westbourne Park Institute has 21 in the drawing classes and 49 in the building classes. Out of the 58 students who meet at the Church Institute, Upper Tooting, 39 represent building. The instruction in masonry at the City and Guilds Central Institution deals with the most difficult problems of stone-cutting, and yet there are 41 students of masonry, and 60 students receive manual instruction as teachers. The Finsbury Technical College has gained a name through two of its professors. We find that no less than 394 students attend the classes for electrical engineering. These are only a few samples of the numerous variations in the statistics which are to be seen in the report, and they merit consideration by the County Council whenever there is an appropriation of the surplus from Customs and Excise.

Another subject for consideration is the convenience of students. If technical schools are to be only a sort of mock universities, where things in general of a scientific class are to be treated, it does not matter where they are placed. For dabbles in science and wealthy students the City and Guilds Institution was fitly placed at South Kensington. The position gave a sort of fashionable status to all concerned with the enterprise. But the long ranges of empty rooms will reveal to any one who is able to judge that a worse position could not be found for a building to be used by students who are connected with business. In London, where so much appears to be arranged indiscriminately, there is a sort of connection between businesses and districts. Building, for example, is carried out all over the metropolis, but the men congregate in certain parts. The census returns show that in Fulham, Chelsea and Wandsworth 50 and upwards among every 1,000 of the population are men and boys engaged in building. In Hackney, Lambeth and Camberwell the proportion is 40 to 50 per 1,000. In Kensington, Marylebone, Hampstead, St. Pancras, Islington, Holborn, Shoreditch, Southwark (St. Saviour), Greenwich, Woolwich and Lewisham the proportion is 30 to 40. In St. Olave, Southwark, Stepney, Mile End, Bethnal Green and Poplar it is 20 to 30. In the City and Whitechapel and St. George's-in-the-East it is 10 to 20 per 1,000. From these data it is not difficult to determine the most eligible site for a builders' technical school. For the metal trades Poplar and Greenwich have preference; next come Holborn and St. Saviour's, Southwark. Printers and bookbinders also most abound in Holborn and St. Saviour's, Southwark. Shoreditch and Bethnal Green contain the largest proportion of inhabitants occupied in the wood and furniture trades. The chemical trades are most numerous in St. Olave, Southwark, and the clothing trade in the City, Whitechapel, St. George's-in-the-East, Shoreditch and Bethnal Green. The maps, which are tinted according to the density of population of different trades, suggest why some trade institutions are failures. The reports point out how "in Paris the trades are almost entirely dealt with by centralised institutions, each planted in the heart of the industry in question." For elementary technical instruction in London, Mr. SMITH ascertained there was a conclusion "that classes must be brought as near as possible to his (*i.e.* the workman's) door, any available buildings, such as Board Schools, being used for the purpose;" but they should be "grouped round and leading up to central institutes equipped in the

best manner for practical work, and devoting themselves mainly to some important group of industries in the district."

The grouping of schools around institutes is only a part of a very extensive scheme of systematising which Mr. SMITH recommends, and which comprises the training of technical teachers, the teaching of art, science, technology, manual work, commercial subjects and household economy in London. The establishment of museums, the foundation of scholarships and exhibitions and other means of advancing technical education are treated at length. Mr. SMITH does not propose to set aside the arrangements already made by various bodies; he would increase the efficiency of existing institutions by grants from the London County Council. One of his proposals deserves to be printed in these columns:—

I have suggested above that professorships of architecture should be formed in connection with the teaching university. The inclusion, however, of the training of architects among the functions of such a body would depend on the inclusion of art teaching generally among its faculties. To separate architectural form from other branches of art teaching and put it under an academic body to be taught by lectures and tested by examinations, would be extremely undesirable. The architectural student wants his studios and workshops for practical work—drawing, painting, modelling, carving, &c.—as much as the engineering student wants his laboratory and workshop. Leaving it for the present an open question whether the training of architects should or should not be a university function, we may at least consider the question of a school of architecture as a department of higher education.

The only agencies at present devoting themselves to the training of architects (besides the small amount of teaching done at University College and King's College) are the Royal Academy Schools, the National Art Training School and the Architectural Association.

The Architectural School at the Royal Academy is outside our scope. It is only an evening school, as distinguished from the schools of painting and sculpture in which teaching is given every day. The National Art Training School trains teachers of architectural drawing, but very few architects, and there are only a very few architects attending the District Schools of Art (the greatest number of these being in the life class at the Westminster School). The Architectural Association has for some years carried on courses of instruction for its own members. At the beginning they were taught by voluntary teachers, but now they have been reorganised under paid instructors. Some hundreds of students in all attend these classes at the Association's studio in Conduit Street. The Royal Institute of British Architects examines but does not teach.

The question arises whether the work now tentatively carried on by the Architectural Association, which might at any time fall to the ground, and which at present is confined to members of that Association, could not be consolidated and developed by the aid of the Council into a school of architecture.* The Westminster Architectural Museum, which sadly needs re-housing, could be attached to such a school.

To go into details, however, is premature. It is enough to say that (1) the provision for the training of architects in London is scandalously inadequate; (2) that such training, if improved, would raise the standard of the whole of the building crafts, and that a school of architecture and the building trades could become a centre of influence, giving tone and dignity to all the scattered classes for the various branches of the building trades throughout London; (3) that such training as is being done is chiefly done by a voluntary society with no guarantee for its permanence, and is confined to its members; and (4) that if a move is made to realise the idea of a great school of architecture, the Council would do well to help the project in every way in its power, both by annual endowment and aid for equipment.

The creation of a municipal school of architecture would be a splendid achievement for the London Council.

Whether the municipal funds would be rightly employed for such a purpose remains to be seen. If architects are ever trained at the expense of the public it must be expected that they will make a return by working for a remuneration much lower than prevails at present. Nor is there any reason why the rates should not be also applied to the education of physicians, lawyers and clergymen. If the existing system of education for professions is inadequate and if it cannot be improved unless by the help of county councillors, the outlay for the purpose should be met by payment that will bear a proportion to the expenses. In any case the proposal for training of architects will hardly serve Mr. SMITH's and his committee's cause with the ratepayers of London, and architects will not be grateful for it. But there is some excuse for such proposals, when it is found that so many architects are ready to declare that the majority of their brethren are incompetent.

The amount which Mr. SMITH believes it would be

necessary to grant for the first year to help technical institutions is 80,000/. As there is a likelihood of "leakage" to any extent in expending the money, he insists on the necessity of a central organisation. He suggests the creation of an administrative committee consisting partly of members of the London County Council, and partly of members drawn from the School Board, the City and Guilds Institute, the governors of the Polytechnics and the London Trades Council. He also recommends that "small advising trade committees, representing the main groups of the skilled London trades, should be formed to visit and report to the committee from time to time on the practical teaching of the more purely technical subjects," and there is no doubt inspectors of that class would be efficient. The central organisation would cost 50,000/. a year in addition to the 80,000/. In a year or two it would be necessary to increase the grants to 100,000/.

It will be wise to give serious consideration to the proposals. In England, where individuality is inherent among the people, and where everybody can be independent, co-operative efforts for education are liable to failure. Successive Governments have been unable to make of the Science and Art Department a useful institution. In spite of the laudations which are heard at the annual distribution of prizes, there are few towns in England where the products of the art schools can be taken as worth the expenditure. Mr. SMITH says of the farming system which now prevails in the schools, that it is "so thoroughly bad, both in its effects on the management of the schools, and the remuneration and conditions of tenure, that the County Council would be well advised to insist on its abolition as a condition of assisting the schools." The removal of many other defects in the schools is also indispensable if efficiency is really desired. But, with the best efforts, it will take a long time before manufacturers and practical men can believe in the advantages of technical schools. Experience of the South Kensington system has raised a prejudice against teaching which is in any way supposed to be under Government control, and therefore likely to hamper production by some form of circumlocution. This is exhibited in many ways, and students have often to suffer through it. How far the prejudice can go, and how it affects teaching that is independent of the Science and Art Department, may be judged from one part of Mr. SMITH's report. He commends a suggestion of Professor AYRTON that "leaving premium scholarships" or assistance in money should be provided for students who have gone through courses of technical education, but on that account are not prized by men of business. The Professor says:—"At the completion of the course at a technical college, those who come out at the top or those who have influence get posts at once; those who are not so good, but who have money, can enter at works at a reduced premium; but the poor, fairly good student finds it very difficult to get a start—very difficult, in fact, to enable him to show the manufacturer what he can do. For in consequence of the premium system a student who has passed even creditably through his course, but who is not at the top, and who has neither influence nor money, will not be admitted into a works even to give his services for nothing."

This is a remarkable admission, for it comes from a teacher who has attracted thousands of students in a few years. But as long as the public identify science with South Kensington, we must expect that trained students will be handicapped whenever they try to turn their knowledge to account. From what is said in many places it might be imagined that the world is craving to obtain the help of the students of technical classes. The reality is revealed by what is said by Professor AYRTON. It is not so in other countries. County Councils would, however, be wiser to recognise the prejudice than to ignore it.

Let amateurs say what they will, the best technical education for workmen can be devised in connection with their workshops. The youths and adults who attend schools with pompous names too often imagine that they are taking part in some process which, in a mysterious way, will emancipate them from the drudgery of their trades. The daily toil on works becomes distasteful to them. In England the great need is for intelligent, active, industrious and courageous workmen (there is a superabundance of over-

* See *Architecture: a Profession or an Art?* (edited by Norman Shaw, R.A., and T. G. Jackson, A.R.A.), especially the concluding chapter.

seers in the market), and if the London County Council will keep that end in view and attain it the ratepayers of the metropolis would not grudge an expenditure of 100,000*l.* a year. But if the assisted schools will only turn out a greater number of "science students" of the kind that is approved by the Science and Art Department, then as far as the promotion of industry is concerned the money might as well be cast into the Thames.

CHURCH BUILDING IN ENGLAND.—II.

IN his "Past and Present" CARLYLE wrote:—"The pious munificence of England lies far scattered, distant, unable to speak and say 'I am here,' must be spoken to before it can speak; pious munificence, and all help, is so silent, invisible, like the gods." The Parliamentary paper on "Churches and Cathedrals" is a commentary on his words. For it is not only in the metropolis and the surrounding district that we find evidence of extraordinary munificence in erecting churches, but throughout the country. It is easy to understand that benevolent people would expend money when they found there were crowds without churches near them, but in such cases it might be supposed that plain buildings would meet the requirements. Nor is it surprising that the Duke of NEWCASTLE should expend 30,000*l.* on a church "for the use of his family and others residing in Clumber Park." But what is remarkable is the number of churches for which large sums were contributed in order that they might be made worthy of their services. We shall notice a few of those examples of generosity.

The church of St. Mary, Portsea, cost 46,383*l.* The Admiralty gave 50*l.* and the Church Building Societies 650*l.*; the remainder of the money was mainly contributed by the late Mr. W. H. SMITH, the member for the Strand division. At Toddington, in the diocese of Gloucester and Bristol, the new church cost 44,000*l.* The Earl of ELTON erected St. James's, Kingston (Purbeck), which cost 40,000*l.* At Burton, St. Paul's Church was built, at an outlay of 40,000*l.*, by Lord BURTON, who also contributed 14,000*l.* for St. Margaret's Church and 10,000*l.* for Range-shore Church. The greater part of the cost of Holy Trinity, Burton, that is 30,000*l.*, was contributed by Lord HINDLIFF. For St. Mary, Bury (in the Manchester diocese), the subscriptions amounted to 30,000*l.* Mr. E. S. HEYWOOD paid 36,550*l.* for building the church of St. Augustine, Pendlebury, besides 2,091*l.* for the site. The private gifts for Shelton-cum-Newby Church and Studley Church (Ripon) were 40,000*l.* and 30,000*l.* respectively.

The expense of rebuilding St. Mary's, Southampton, was 30,000*l.*, and the private benefactions came to 29,400*l.* Holy Trinity, in the same town, cost 14,000*l.*, towards which the grants were 375*l.*, the remainder being donations. Mr. W. NICHOLSON paid 22,000*l.* for building Holy Trinity Church, Privett, also in the Winchester diocese. At St. Leonards one church cost 22,000*l.*, a second 17,800*l.*, and a third 9,269*l.*, and at Hastings sums of 10,000*l.*, 9,500*l.*, and 6,200*l.* were expended on new churches, besides 10,940*l.* on restoration. In the Plympton district, 29,000*l.* was laid out on a new church at Revelstoke, besides 20,000*l.* on the restoration of Holbeton Church. Cheltenham stands well in the return, as the outlay on St. Matthew's was 25,000*l.*, St. Stephen's 11,000*l.*, and SS. Philip and James 14,500*l.* The cost of St. John, Scunthorpe, exceeded 20,000*l.*, which was contributed by Lord St. OSWALD. The late Mr. GRIFFITH LLEWELLYN expended 20,000*l.* on St. Catherine's, Raglan.

Leicester appears to have expended no less than 69,685*l.* on new churches and 21,497*l.* on restorations. Large as was the amount, only a seventh was derived from the societies. St. Peter's cost 15,200*l.* and St. Saviour's 20,000*l.* (a gift of the Rev. F. G. BURNABY), St. John Baptist 10,000*l.* St. Saviour's Church, Walthamstow, costing 20,000*l.*, was erected at the joint expense of Mr. J. KNOWLES and Mr. R. FOSTER. The cost of St. Thomas the Martyr, Brentwood, was 21,910*l.*, which, with 410*l.* grants from societies, was subscribed. It was a private gift of 25,000*l.* which enabled the parishioners of Halkyn (St. Asaph) to erect their new church. In Rugby the rebuilding and enlargement of St. Andrew's amounted to

25,000*l.*, derived from voluntary contributions. The Earl of FITZWILLIAM gave 25,000*l.* to erect a parish church at Wentworth.

In the diocese of Manchester large sums have been contributed by individuals. An anonymous benefactor supplied the money required (24,060*l.* 8*s.* 4*d.*) for building St. Benedict's, Ardwick. Mr. C. P. STEWART contributed 16,000*l.* for St. James, Collyhurst. Lord EGERTON OF TATTON gave 10,700*l.* to build St. Clement's, Ordsall. Holy Trinity Church, Ashton-under-Lyne, was erected by Mr. G. HEGINBOTTOM at a cost of 14,682*l.*; Mr. J. WHITEHEAD paid 6,471*l.* for Roughtown Church in the same town, and Mr. J. F. BUCKLEY 7,000*l.* for a church at Greenfield, Stalybridge. Mr. T. GREENHALGH subscribed 48,500*l.* for two churches (All Souls and The Saviour's) in Bolton. Nearly the whole of the outlay on other churches was obtained by voluntary contributions.

Liverpool has not expended more than one-third the amount that was raised in Manchester on account of churches. Although doomed to be in all things far behind its assumed rival, there is no doubt that Liverpool possesses some people who are willing to give as well as to receive. All Hallows, Allerton, costing 20,000*l.*, was built by Mr. JOHN BIBBY. A bequest of 25,000*l.* was given towards the 28,000*l.* required for St. Matthew and St. James, Mossley Hill. Mr. H. DOUGLAS HORSFALL built St. Agnes, Toxteth Park, costing over 28,000*l.*, and Mr. T. F. HARRISON built St. Anne, Stanley, West Derby, which cost 12,000*l.* As a rule, the churches in the Liverpool diocese were cheaper, probably the average might be taken at 5,000*l.* Among the new buildings are St. Stephen, Edge Hill, removed and rebuilt by the London and North-Western Railway (outlay, 14,249*l.*), and St. Aidan, removed and rebuilt by the Mersey Docks and Harbour Board (outlay, 8,000*l.*).

The number of churches erected by single donors, at a cost varying from 10,000*l.* to 20,000*l.*, is very large. Among them are Swarraton (Alresford), 15,000*l.*, by the late Lord ASHBURTON; St. Mary's, Tedworth, over 12,000*l.*, by the late Sir JOHN KELK, the contractor; Llangwrig Church, Bangor, 11,000*l.*, by the late Chevalier LLOYD; St. Paul, Spalding, 16,000*l.*, by Miss CHARMEON; St. John Baptist, Spalding, 12,000*l.*, by Miss JOHNSON; St. Matthew, Surbiton, 20,000*l.*, by the late W. M. COLTHURST; St. Paul, Morton, near Gainsborough, 10,150*l.*, by Sir H. B. BACON; St. Peter, Scorton, 13,000*l.*, by Mr. J. ORMROD; the restoration of St. Laurence, 10,000*l.*, by Miss DENISON; St. Nicholas, Whitehaven, 10,092*l.*, by Miss GIBSON; Altofts Church, Pontefract, 10,000*l.*, by Mrs. MEYNELL INGRAM; St. John, Carlton, Pontefract, 18,000*l.*, by Lord WHARNcliffe; Luttons-ambo, 13,125*l.*, and Helperthorpe, 7,885*l.*, besides the restoration of Kirby Grindelythe, 12,600*l.*, by Sir TATTON SYKES (the figures are said not to fairly represent the cost), and St. Mary, Holmbury, 10,000*l.*, by the late G. E. STREET, R.A. Mr. WATERHOUSE, R.A., has not been as yet called on for so large a disbursement. He appears as aiding with subscribers to raise 1,325*l.* 11*s.* 4*d.* to restore Yattendon Church, and renew bells and organ.

It might be assumed from the return that seeking money for building and restoring is not a troublesome task. "Voluntary gifts," "donations," and "subscriptions" may represent wearisome toil, heart-burning and disappointment for many a clergyman, although those accompaniments of church-work may not be represented. We get an occasional, and it may be an accidental, glimpse of the difficulties when we find the source from whence the 4,505*l.* needed for building St. Paul's Church, Winchester, was tapped by "writing letters to persons in all parts of the country," or at Hagbourne, near Wallingford, where 30,000 letters of request produced only 1,500*l.* The late Mr. BOURDILLON allowed the secrets of his success and his troubles to be buried with him undivulged, for it appears "no account can be found of the way in which he raised the money" (about 2,000*l.*) that restored St. Peter's, Little Horksley. Shareholders are not supposed to be open-handed in these days of scanty and irregular dividends, but directors of charitable institutions will be glad to learn that the 2,610*l.* for St. George's Church, Netherfield, Nottingham, came from shareholders of the Great Northern and London and North-Western railways. Much more can, no doubt, be obtained from the same source by the exercise of tact and perseverance.

When Sir ROGER DE COVERLEY observed the scarcity of steeples west of Temple Bar, he exclaimed, "A most heathenish sight!" It was not only in London, but in most parts of England where that sort of sight was presented. The old knight would now be the first to acknowledge that England, in regard to churches, was transformed. The work was then slow, but our time, as WORDSWORTH said—

Is conscious of her want ; through England's bounds
In rival haste the wished-for temples rise !
Their Sabbath bells' harmonious chime
Floats on the breeze—the heavenliest of all sounds
That vale or hill prolongs or multiplies !

ART AND SANITATION.*

IN addressing you on the subject of the "Fine Arts in Relation to the Sanitary Condition of our Great Cities" I am met by two difficulties—a Scylla and Charybdis—that might appal one who had not set out with a determined purpose or was not sure of his way. The first difficulty is that the work of the artist and of the sanitary engineer seem to stand so very far apart in our minds that I may be challenged with the question, "What have they to do with each other? Speak about either of the two things, and we will listen; but let us have one thing at a time." The second difficulty is, that the two—art and sanitation—are so nearly identical, are so interwoven in their action and reaction, that you may too hastily assume that anything I may have to say regarding their relation to each other must necessarily be obvious and trite.

Now I am not afraid of either of these difficulties. In simply stating them I have left both behind, and am content to let Scylla take care of Charybdis. For when you come to look into the matter, what is art but the science of beauty, and are not beauty and health pretty nearly synonyms? At any rate the two things go very much together. They "keep company," as the lads and lasses say. Where perfect health is there is beauty. Where perfect beauty is there is health. In other words, if health is the foundation of the temple of beauty, beauty is the shrine in the temple of health.

Now I know that I am speaking to citizens of no mean city. I am ready to admit, if you tell me that it is so, that all our great cities are lovely and healthy, and that London is the loveliest and healthiest of them all. But whether this be so or not one thing is certain, viz. that to us it is our home. And when our short English summer is over, and the dark days of winter are upon us, it is a matter of no small moment to us what our home is like. From sunny fields and silvery streams, from sea and lake and forest, from the golden light of the south and the eternal snows of mountain fastnesses, we stream back to London, and we know not whether, when we get up in the morning, we shall be able so much as to see each other's faces across the street. Is London in the month of January a desirable place in which to set up a studio for painting? Is London all that could be desired as an art centre? Is it not worth while to inquire whether we could make our great cities more habitable, more pleasant to live in? That is the question to which I address myself to-night. And I will begin by laying before you a series of propositions to which I invite your assent.

The first is that the progress of art in our country and the free development of some of its finest characteristics have been arrested by the foul condition of the atmosphere of our great cities. The second proposition is that the appliances necessary for the sanitation of our dwellings are not irreconcilable with the laws of beauty. The third is that, according to the law of beauty, as well as the law of sanitation, things are right only in their right place. The fourth is that if you can do nothing better with works of art than smoke them black, like fitches of bacon, your artists will probably (according to the law of supply and demand) give you works suitable for that purpose. My fifth proposition is that any great scheme for the future of national and historic art in England is hopeless so long as this state of things continues. And finally, I shall put it to you that to find a remedy for these evils societies of artists have to look to the Society of Arts. Upon each of these propositions I will say a few words, though, having regard to the limited time at my disposal, they must be very brief.

And first. Do we sufficiently realise how the advance of art is hindered by the insanitary condition of our great cities? Take, for instance, architecture and see how dirt stops the way. How it stops the way, not only of the traffic in the streets—an army of scavengers may cope with that—but how it stops the way of all the splendid developments of decoration, by virtue of which architecture takes rank amongst the fine arts. Just

think, for example, what the façade of a public building might be but for this all-pervading, ever-increasing plague of atmospheric dirt. We need not go back in imagination to the time when our forefathers saw the splendour of Westminster Abbey, its delicate tracery, its shafts of marble, its wealth of statuary, long since lost to us in the veil of black slime that covers everything in London. We need not, I say, go back to the past. We have only to seek out some cathedral in purer air, that has not yet been defiled, to see that the defilement comes not of age but of dirt. Lincoln, for instance, or Winchester or Ely or Salisbury, still show us what magic can be wrought in stone by the wizards we call architects. Why is the loveliness of the natural colour of stone to be seen only by a handful of villagers, or the inhabitants of a small provincial town—why not by the toiling millions of the metropolis? The buildings are there. Beneath their shadow runs the perpetual stream of human life, St. Paul's in the east, Westminster Abbey in the west, each with its own splendour, and the stream of life for ever ebbing and flowing, like the great river that runs between them. But the river is thick with mud, so that the people cannot drink of it; and St. Peter at Westminster, and St. Paul in the City, looking out over the surging masses, cannot see each other, for the air is black with smoke; and the people pass and re-pass, and know not that the grimy objects that fill the niches of the Abbey are amongst the loveliest of the sculptures that the world has ever seen.

But that is only one aspect of the case; it shows how much we lose of the work already accomplished by the great architects of the past. But just consider what we lose in the limitation it places on our efforts to create new forms of beauty. Westminster Abbey is built of stone, and depends for its loveliness on the grace of its structure and the splendour of its sculpture. But art has other resources at her command, and notably amongst these is colour. The façade of Siena Cathedral, or the Duomo of Orvieto, or St. Mark's, Venice, are also full of carving; but amidst the carvings are mosaics; the walls are of marble and porphyry, rich with every change of colour—russet and grey, purple and gold; shafts of malachite; panels of *lapis lazuli*. Why do we in England see nothing of all this? In Orvieto, every public building—I might almost say, every house—is as finely engraved, in proportion to its size, as a signet ring; as delicately coloured by the use of brick or stone, or marble or terra-cotta, as an inlaid cabinet. And then the great west front of the cathedral. The city stands upon a hill, from which you can see, for fifty miles round you, the fair Italian landscape and the beautiful blue line of the Apennines. The sun goes down, and you feel that nature can yield no greater splendour to your eyes than that fair landscape, with the golden light deepening into crimson in the west. But then you turn round and look at the mighty Duomo, flushed with the crimson and gold of the sunset, and you learn what art can do—not to surpass nature, not to compete with her, but to interpret her, to reflect her, to make you understand her better. The great windows flash like jewels, the arches are filled with mosaics of the Apocalyptic vision; every stone is engraved with some story of the saints or of the passion of Christ. And perhaps, as darkness falls upon the city and you walk back to your hotel, you begin to think—what resources of the chisel of the engraver, and the saw and wheel of the lapidary, and the smelting-pot of the worker in mosaic, are lost to our architects, simply because of the foulness of our atmosphere—a foulness not inherent to it, but made ourselves in the innocent process of cooking our mutton chops.

For observe—the fault is not to be charged to our climate. Orvieto, indeed, is on a hill, where the air is always pure, but Genoa and Pisa and Venice and Naples are in reach of the wet, salt mists of the sea, and yet they are beautiful. Ah, no! it is not the climate that we have to fight against. It is the climate plus dirt. It is the climate in unholy alliance with the guerilla contingents of smoke and foul gases that decimate our forces and carry foolishness into the councils of our building committees. Are you going to help us against this enemy? Are you going to clarify the air of London and Liverpool and Manchester and the other dark places of the earth? If it be true that "the dark places of the earth are full of the habitations of cruelty," it is equally true that they are full of the habitations of ugliness. Are you going to give the artist that which he values as his life—that without which life itself is of no use to him—I mean light? If you will enable us to see London, I promise you that art shall make it beautiful to look upon.

Have I said too much about the chimneys? Well, then, let us turn for a moment to the gutter. For we must not be afraid of using rough words, if rough words are necessary to express our meaning. I speak as an artist. If in the utilitarian enterprise of sanitation there is a department which may be called the science of the gutter, there is in the exalted regions of idealism a department which may be called the art of the gutter. And this leads me to my second point—that the appliances necessary for the sanitation of our dwellings are not irreconcilable with the laws of beauty. See how naturally

* A paper on "The Fine Arts in Relation to the Sanitary Condition of our Great Cities," read by Mr. Wyke Bayliss, F.S.A., P.R.B.A., at the meeting of the Society of Arts on January 24.

the aims of the architect fall in with the aims of the sanitary engineer.

For instance, to take a case that comes particularly within my knowledge. In the building of a cathedral it is necessary to provide channels for the flood of water with which a sudden or heavy rainfall will deluge the roof. These channels are made to project in such a manner that the rush of water shall be carried outwards, away from the surface of the walls. But the architect who designs all this is not a builder only, but an artist also. Under his touch, therefore, the gargoyle, common in itself and mean in its application, is ennobled by a secondary use. It is a gutter—but it is more than a gutter, as an architect is more than a builder. It is fashioned into some shape that shall add another beauty to the fabric. Into some shape—yes—but what shape? Shall it be derived from the flora or the fauna that give their wealth of loveliness to the sculptor's work in wood or stone? There is no link of association between these and the purpose to be fulfilled. Shall men and women bend downwards with mouths agape to scatter streams of water on the incautious passer-by? Their places are within the church. Shall the angels be made to fulfil this gentle office? Rather let them, with outstretched wings, bear up the fretted roof of the choir, looking down with mild eyes on the worshippers. But the fiends, the fiends that come with the night winds, bringing with them the fury of the storm. The fiends that lurk in the miasma of foul air. The fiends that clamour at the painted casements, which they cannot break, because the sword of Michael, with which he drove them out of heaven, flames there. The fiends that rock the great steeple to its base, if only they may shake down the cross uplifted high in air. The fiends that beat despairingly against the massive doors, strong with a strength beyond that of oak or iron. Transmute them into stone! Let them grin downwards on the happy throng which crowds the threshold they can never enter.

New here is a strange thing. The very end and aim for which our cathedral is built is to make war against the Wicked One and all his hosts. And yet, just at the critical moment, when the architect is at a loss to deal with an essential part of his design—lo! of all things in heaven and earth and hell—it is the “fiends” who come to the rescue. And why not?—if my third proposition be true, viz. that in art, as well as in science, nothing is to be regarded as common or unclean if only it be in its right place. Whether a gutter is in itself a thing of beauty depends upon the point from which it is viewed. Is the hippopotamus a thing of beauty? As he lolls against the prison bars of his house at the Zoological Gardens, with rolling eyes and huge mouth opened wide for sweetmeats, it must be admitted that his shape is not elegant, and that his countenance is not attractive. But in his right place it is a very different matter. On the broad shores of the Nile, when the landscape is shimmering under the blaze of a tropical sun, when, as far as the eye can reach, there is nothing but the burning stillness of the vast solitude of vegetation without life—see! that mighty rush, as leviathan passes to the water. See! the white foam lashed to the skies, and through it the purple and gold of his harness, iridescent with light, startled from its sleep upon the river. The sea-horse is himself again. Offer him a biscuit now!

It is thus that art deals with sanitation. The gargoyle, if placed upon a pedestal in a drawing-room, would not add a grace to the apartment. But in its right place—high up, that is, upon the cathedral roof, casting its deep shadows from the meridian sun, or touched by the silver of the moonlight—there it is as beautiful to the idealist as it is useful to the utilitarian.

But the gargoyle serves another purpose. It serves to transfer our thoughts from architecture to sculpture. The gargoyle is essentially the design of the architect, but it brings the sculptor into the game, who, mounted on the high scaffolding, may still find work to do in the fretted roof or the crocketed spire. But the sculptor does not aspire to remain, like St. Simeon Stylites, always on so high a pinnacle. He would like, sometimes at least, to descend to the tympanum of an arched doorway, or the floriated capital of a column, or even to the pavement of the street, and show us what he can create in the shape of a lovely bas-relief, an acanthus scroll, or a statue. But if he attempts such a thing, what will become of his work? What has become of the few works of sculpture that are supposed to adorn London? Do they not look as if they had suffered martyrdom at the hands of the street gamins on the 5th of November? They are absolutely black with slime. Is that the best thing you can do with them? If they are to be treated as guys, why should they not be made as guys? That is my fourth proposition. The sculptor cries for help. Who will save him and his work from this degradation? Who will give him the hope of a future? We look to you. When you have cleared our great city of its tenebrous pall, and given us light; when you have cleansed our temple, we will decorate its shrine.

And then painting. What a glorious art it is in its noblest form—that of mural decoration. And yet no Englishman who has seen Tintoretto's designs in the Ducal Palace at Venice, or

Luini's great fresco in the church of the Angels at Lugano, or Raphael's decorations in the Loggia of the Vatican, can feel otherwise than that we are cut off absolutely from at least one phase of art, and that, as I have said, its noblest and grandest. But why? Again I say, it is not the climate that decimates our forces. It is the climate *plus* dirt.

What, then, is our hope for the future? Have we any hope for the future? My fifth proposition is that any great scheme for the development of national and historic art in England is hopeless so long as this state of things continues. This is a hard saying, but I will put it to the test by venturing to make a suggestion. I ask you to recollect the position that England has taken in the history of art. You know that there have been two great periods of art—the Classic, which gave us the Parthenon, and the Gothic, which gave us Westminster Abbey. You know that the mastery in these two schools, each perfect in itself, and neither second to the other, belong to the people of Greece and to the people of England. The race of men who built our cathedrals are the equals of the race of men who built the Acropolis of Athens. We then, as Englishmen, have a past to look back upon, and ought to have a hope for the future. We are a nation with high aspirations, ready and strong to do great deeds which shall be worth recording. And we have painters capable of drawing pictures on a wall. Let the nation, through its representatives, choose the event, and the artists choose from among themselves the man who shall paint it. One picture every year—of the chief event of the year, or the most noble deed done, or the highest good achieved. In the choice of subjects there should be no boastfulness of petty princes blazoning their puny exploits. Nothing should be recorded that had not stirred the heart of the people. In the choice of painters there should be no voluntary display of raw ambition, or fashionable frivolity or senile declension. They should be chosen by the suffrages of their fellow-painters in their prime, so that their work would become in itself a true historic record, not only of the executive power, but of the collective judgment of each living school of art as it arose, flourished and passed away. There is no genius of which the nation is proud that would be waste material or might not take its share in the enterprise. The pencil of Leighton would not be too refined, nor that of Watts too serious, nor that of Millais too robust. Landscape, the glory of English art, would find its place. Even the sculptor need not stand aside, for the sequence of glowing canvases might be varied by a group or a bas-relief in bronze or marble. The subject selected and the name of the artist chosen might be announced annually with the opening of the exhibitions of the year, and the artist should be allowed one year in which to complete his study or cartoon of the picture. Then his cartoon should be exhibited to bear the criticisms of the people. Few errors of historical importance would escape such an ordeal. Finally, the work should be completed by the artist, under no control save the influence those criticisms may have wrought upon his mind. There would be no risk of failure in such an enterprise. The events will come; the nation may be trusted for that. The men will come; some are with us even now, ready to begin the work. This would, indeed, be historic art, the marriage of art with history. And think what would be the issue in ten years, in fifty years, in a century. We look with wistful eyes into the future and picture to ourselves what we should see under such a scheme as this. Unless the future altogether belie the past we should see such scenes as these.

The hospital at Scutari—the sick and wounded of our soldiers on their pain-stricken beds—and then—

Lo! in this house of misery
A lady with a lamp we see
Pass through the glimmering gloom,
And flit from room to room.
And slow, as in a dream of bliss,
The speechless sufferer turns to kiss
Her shadow as it falls
Upon the darkening walls.

It is “Santa Filomena.” It is Florence Nightingale herself, not an imaginary suggestion of what she might have been, painted a hundred years after we had lost her, but she herself—

As if a door in heaven should be
Opened and then closed suddenly.

And then we see the interior of a classroom in London, with a few grave men and thoughtful women, and the pale faces of many children—large-eyed, wondering children—who shall grow up to see themselves in this picture, and to know that they were painted there because the opening of the first Board school was a revolution, mightier in its results and more far-reaching than any that has yet been chronicled in England. And then we see the senate-house at Cambridge and the first girl-graduate receiving her degree that shall acknowledge her to be as wise as Merlin, and leave her still as beautiful as Vivien.

We look for scenes like these because, although the past returns no more, yet the future shall be like it. Do we look for

them in vain? That is a question that can only be answered by the nation. Can be only answered by the nation, did I say? Ah, no. The nation cannot answer it, except through you. Who is there amongst you who will help to frame the answer? We wait for you. Dear as are the remembrances of the past, splendid as are these visions of the future, we can do nothing to realise them without you. Our frescoes peel from the walls, our paintings blacken in the foul gas, our mosaics corrode before our eyes, our statues trickle down with greasy slime. But when you have cleared our great city of its tenebrous pall and given us light—when you have cleansed our temple—we will not be slow to make its shrine beautiful.

That, Dr. Richardson, is what I, representing a society of artists, have to say to you, representing the Society of Arts. We long for your city of Hygeia. We know that science is working for us. The science of beauty greets the science of health. All that I have said of these three branches of the fine arts, architecture, sculpture and painting, in association with our national monuments, is true relatively of every subsidiary development of art. Science would cleanse the house and flood it with light. Art would cleanse the mind and fill it with beauty. And see how the two things, sweetness and light, which I call "the holy alliance," follow each other in natural sequence. Go into the dark little rooms of the labouring classes, and if it is not, indeed, too dark to see, observe the dreariness of the surroundings of our poor. They toil and spin, but they are by no means arrayed like Solomon in all his glory; they work like the bees, but they are not

Singing masons, building roofs of gold.

How can art penetrate to these dismal chambers? You know that in the old Mosaic dispensation it was forbidden to muzzle the ox that treadeth out the corn. Are we to be less careful for the labourers that contribute to our luxuries? How, I say, can we penetrate to their dwellings? We have our free galleries and museums, thank God, in almost all our great cities. But I want to get closer home than that; I want to lift the door-latch of the cottage and dreary flat, and the little parlour at the back of the shop; and I say, let sanitation lead the way, and art will follow. Give them light, and they will at least see the dirt and the nakedness of their walls. Give them light and cleanse their walls, and the cheap print will follow. And the print, though it may be cheap, need not be nasty. As it becomes cheaper, it will become better. And they will become better and happier with it; for with the sight of art will inevitably grow the love of art, and with love, happiness; and happiness is, perhaps, one of the most powerful disinfectants the world knows.

That is the reverse side of the shield. The main purpose I have had before me has been to show how much may be done by a Society of Arts for a Society of Artists. But there is another aspect of the question to which I wish to refer before I conclude. I mean the return that art can make. For, after all said and done, we may take it as certain that art is, and always must be, one of the environments of our lives that is daily shaping them to fair or foul issues.

Bad art, therefore, means much more than bad artists. It means dreary surroundings in our dwellings, ignoble buildings in our streets, evil thoughts in our hearts. But the miserable hoardings of our railway-stations, plastered with hideous posters that crush our eyes as with a weight, forbidding us to raise them from the mud upon the ground; the blank walls and ungainly furniture of our houses that make mud in our minds—these are not necessary evils. It is we who have made them, and cursed them with ugliness; they only return to us the curse, in mental depression, with its inevitable tale of physical suffering. If the artist is interested in the work of the sanitarian, the sanitarian should be equally interested in the work of the artist. I know that the erection of a fine edifice on the north side of Trafalgar Square, and the transfer of the Arch of Titus to the east end of the Strand, would not efface the calendar of crimes to be tried at the next assizes. But because art cannot do everything, it is unreasonable to conclude that it can do nothing. It can at least do this. It can so transfigure a little colour that lies inert upon the palette into a living presence that our hearts shall beat faster only to look upon it. It can so link thought with thought and put them into sweet words that we may look through Shakespeare's eyes upon an English garden of three hundred years ago, or hear the storm-shaken pines which make music in the Volkslied, or see the shadow that lay dark on Dante's life as lies the shadow of the cypresses upon his grave at Ravenna. It can so build stone on stone, and shape them into beauty, that the architects of the thirteenth century shall speak to us of the nineteenth, making us stronger for our duty and happier in performing it. For art stands alone in this, that it engages not some but every faculty of our being. Like the summer clouds that fill the sky, art sweeps across our world, drawing into itself all our aspirations, all our scientific attainments, every tender emotion of our hearts. How beautiful are these summer clouds! Now ranged in lines like the battle-

mented walls of a distant city; now massed together like an army with banners; now drifting through the azure in a myriad of ethereal shapes, like a company of angels looking down on us from heaven. How beautiful is art! in the splendour of its imagery, in its storms of passion, in its serene contemplation of things divine. But it is only art; but they are only clouds. Does science say they are only clouds? How then are the furrows made soft with the drops of rain? And art? Believe me, no tender thought or noble aspiration or high enterprise is lost to us because art fashions them into beautiful shapes. They come back to us as the rain comes from the clouds, and they make our lives fruitful in faith and wisdom and love. But the artist lives and works and dies, and his works perish with him. Why should they perish with him? That is the one question I press upon you. They need not perish with him. The time shall yet come when, if not the artist, at least his works shall be immortal.

EGYPTIAN ART.

IN his second lecture at University College Professor Flinders Petrie spoke upon Egyptian art from the sixth to the twelfth dynasty, in which he observed that after the grand school of the pyramid builders described in the previous lecture, the political and artistic power having somewhat decayed, the desert tribes pressed into the eastern side of Lower Egypt, and, seizing the capital, left the feebler art of the southern provinces isolated. No great works are known of this period of depression. The grand school of black granite was captured by the desert invaders, and we have one statue in this material of King Khian. It is only very lately that we have put his history together, and it is certain that he came shortly after the sixth dynasty. He is always called "Prince of the Desert" on his scarabs, but he adopted Egyptian titles on his sculpture. It is possible that this race worshipped guardian angels, and not greater deities, as he is said to be "beloved of his *ka*," or double. On the rise of the twelfth dynasty the Egyptians regained the Delta and the fine schools of sculpture, which had greatly deteriorated. Their best work is always formal, and, seeking to avoid heaviness, they fell into a shallow, slender and weak style, which further deteriorated into a peculiarly cold and harsh manner in the thirteenth and fourteenth dynasties. The Hyksos, a second invasion from the east of the Delta, broke in after this and secured the school of black granite, which, from its falling thus in the hands of invaders, lay probably in the Sinaitic Peninsula. The only parallel in all ancient types to this peculiar race is a people in North Syria, shown on the sculptures of Rameses II. Heavy as the race appears, there is yet no depreciation in the technical art during this period; and it seems as if a centre of civilisation had lasted at the granite quarries, which maintained its traditions, and was but little affected by the politics of Egypt. Meanwhile, the southern art had been studying good examples of the early times, and improving; and when the southerners again claimed the whole land in the eighteenth dynasty, their art blossomed with much purity and grace, which make up to some extent for the loss of pristine vigour and animation. There is no period after the fourth and fifth dynasties so worthy of admiration as Hatasu's. In minor work there was also spirit and life. A wooden statuette from Gurob may bear comparison with the celebrated wooden statue in the Ghizeh Museum. But the expression is infinitely different. The genial greatness of character in the statue of the old kingdom is replaced by a face belonging to a complex civilisation—calculating, hard, overbearing and heartless; the charming character and simplicity of early times has irrevocably disappeared.

TESSERÆ.

Titian and Rubens.

CRITICS are in the habit of confounding Titian with Rubens. No comparison can be more unjust to the Venetian. Rubens could not represent the woman life; he never touched it without defiling. His province was altogether different. What he could deal with successfully was the purely animal life, the rich and lavish life of the tropics more especially. The lustrous fur, the sleepy savageness, the stealthy grace, the infinite luxuriousness of the leopard cub and the river god are rendered with exquisite vivacity. It may be said that his most famous paintings are occupied with other subjects; but even of the Antwerp *Christ* the criticism holds good, for the peculiar effectiveness of that painting is derived from its curiously plain, homely and unaffected rendering of the mere animal body without life, which, as associated with a mystery which we cannot penetrate, has always retained over the imagination a certain morbid and unwholesome fascination. Now, Titian may not have the highest insight into the woman

life, but he has at least none of the essential vileness of the Dutchman. His *Flora*, his *Venus* in the Tribune, and his *Sacred and Profane Love* in the Borghese, are all copied from some captivating and bewitching ideal. In each we have the golden hair, the delicate life of the complexion, the fresh, meditative, voluptuous beauty. There may not be, perhaps, much of the soul, or of the higher heart and imagination, but still they are always redeemed from the grossness of Rubens by a certain abstract and indefinable refinement, by the subtle woman grace, if not by the divine woman purity. And this criticism may be very widely applied to all the maxims of the Venetian artist. Nothing can surpass his richness, fluency and brilliant imagination; but the moderation of his genius is quite as conspicuous as its versatility. The arrangement and ordering of the picture is always, as in the *Venetian Slave* of Tintoretto, Bonifazio's *Presentation of Moses*, and the *Rosario* of Titian, superb and sumptuous, as though the artist had been used to the regal ermine and the stately ceremonials of doges and kings; but, at the same time, there is none of the gilding and tinsel of the court lacquey, and the colouring, however lavish, is invariably chaste and harmonious. The drawing also, though neither sharp, hard nor coarse, is perfectly precise and distinct, exquisitely clear, delicate and transparent. Here Titian specially excels. He says what he has to say without any effort, but with a clear and joyous resoluteness, the fascination of which it is impossible to resist. There was neither weakness nor mistiness in his work.

English Sculpture in the Fourteenth Century.

Until the reign of Edward III. we can scarcely recognise an independent style of sculpture in England. The revolution in costume in that prince's reign produced a vast influence on art; the flowing draperies and beautiful arrangement of the dresses of females, with the fine chain-mail, which adapted itself to the movements of the figure, and was so favourable to the exhibition of natural forms, were then discarded. The light plate-armour introduced by the Italians, and adapted to German taste, together with the less graceful costume of females adopted at that period, checked the advancement of sculpture, and left little scope for the aspirations of genius. The good principles of taste were irremediably checked, and never again appeared in their original strength; at the same time, remarkable examples of science or skill in the mechanism of art were occasionally produced. The statue of the Black Prince in Canterbury Cathedral is a splendid memorial of the ability of the age, and it is as successful a work of its character, in metal, as could have been produced. This statue was gilt, and some of the accessories were tastefully enamelled. The statue of Edward III. in Westminster Abbey is a very dignified specimen of art, and, with the statue of Edward of Hatfield in the same church, is worthy to be placed in rank with the productions of the best period of English sculpture. The names of the artists who executed either of these works remain unknown. Amongst those employed in St. Stephen's Chapel mention is made of Michael, a sculptor, and of the following painters:—Master Walter, John de Sonnington, Roger de Winchester, and John de Carlisle. About the time of Henry VII. the prevalent character of sculpture was vigorous, and, although rude in execution, it was by no means deficient in feeling or expression. The effigies of bronze representing Richard II. and Anne of Bohemia, his consort, were fabricated A.D. 1395 by Nicholas Broker and Godfrey Prest, citizens and coppersmiths of London, who also provided the enamelled scutcheons and other decorative accessories. The fine altar tomb of Corfe marble was sculptured by Henry Yevele and Stephen Lote, masons of London.

Invention in Art.

The highest excellence is to effect the highest objects of the fine arts in the highest manner, *i.e.* by a direct appeal to the mind, as in the case of historical and poetical pictures, in which it is absolutely necessary that there should be some action going on; and the picture should explain itself as to what has gone before, what is actually being done, and give some indication of what is to follow. The physiognomy and costume should identify the scene and the period of the action; and to those acquainted with the history of that country the picture should need no description. But the action itself should be intelligible to all, whether acquainted with history or not; and the art and the artist should be entirely merged in the impression of the scene. But it should be observed that it is not necessary, in order to refine the feelings and to elevate the mind, that the subjects of the fine arts should be selected from celestial or terrestrial magnificence; that the heroes and heroines should be gods and goddesses, kings and princes, queens and princesses. There is as much real dignity in virtue in humble life as when encircled with splendour and rank, and a peasant doing a virtuous action is a subject of contemplation as well calculated to effect the legitimate objects of the fine arts as any achievement of the greatest monarch, surrounded by all the accessories of worldly pomp

and distinction. The second grade of invention is shown in those works of art in which the most elevating impression is produced or some emotion excited by an indirect appeal to the mind, in which the action is inefficiently represented, but the emotion, which would be excited by the action if intelligible, is produced by the general effect of the picture. Titian and Tintoretto afford some fine examples of this production of impressions by secondary means. In this class will also fall poetical landscapes, with or without figures, in which the emotion is excited by the character of the scene and the circumstances under which it is exhibited. As there are grades in the quality, so there are degrees of power in invention. Keeping in mind the test of value in the fine arts, a moderate degree of invention of a high quality must take precedence of a great degree of an inferior quality, unless the degree of the latter be so pre-eminent as to absorb all other considerations, as is the case in some of Rubens's and Rembrandt's pictures. The subject is terrific, perhaps a martyrdom; the circumstances attendant upon it are exhibited in their most revolting character; but the fearful truth and vigour with which every incident is presented is such that, while you draw your breath with horror, a reluctant admiration is extorted by the power displayed in producing so great an effect upon the mind with a few pigments. An instance may be found in Raphael's picture of the Morbeto, where an infant is attempting to suck the breast of its mother, who has died of the plague, the bystanders holding their noses. The incident of the child is revolting, but so natural as to compel an admiration of the painter's invention, notwithstanding the violation of taste. Not so the action of the bystanders, which, though perfectly natural, is disgusting, from its appeal to our sensual faculties, and in a manner calculated to do anything rather than excite agreeable or refined feelings. In these instances the ultimate object of the fine arts is effected in a very indirect manner. From the stupendous power displayed on an ill-selected, perhaps disgusting, subject, notwithstanding the coarseness of the images presented, the mind is insensibly led from the production to the producer by the vigour and truth with which the action is embodied, and to the contemplation of the extraordinary command of mind over matter. It is in the early stages of art that invention is generally found alone, as may be seen in the early Florentine and German schools, Etruscan sculpture, &c. The respective grade which such works are entitled to take will depend upon the intellectual impression aimed at and produced; the effect must always take precedence of the means. As the value of invention will depend upon the degree of taste associated with it, so the rank in which the skill in the art or means is to be placed will also depend upon the degree in which it is controlled or directed by taste.

The Romans in Yorkshire.

Inscribed monuments such as altars from the names of emperors in the inscriptions, prove Roman occupation in Yorkshire from the time of Domitian to that of Volusian and Gallus, thus corroborating the testimony of ancient writers. Of the dated monuments, the most curious is a pig of lead, inscribed with the name of Domitian in his seventh consulship, and found on Dacres Moor, in the centre of the county, close to an ancient lead mine. From the date of the inscription and the place of discovery, we may infer a fact of some importance—that the Romans, immediately after the reduction of the Brigantes by Agricola, commenced working the lead mines in the conquered territory. Besides their chronological value, the Roman inscriptions found in Yorkshire furnish us with much curious information relative to the legions, cohorts and *ala* of cavalry, and the places where they were quartered. Combining this information with the notices of troops in the *Notitia Imperii*, we find that the stations in Yorkshire were garrisoned by the 6th and 9th Legions, and by a variety of foreign cohorts, such as the Nervii and Lingones, whose history has been partially traced out by Horsley, but may be made much more complete by comparing the inscriptions found on the line of Roman wall, published in Hodgson's "Northumberland," and the "Tabulæ Honestæ Missionis," published by M. Arneth, of Vienna, which are copperplates containing the names of such soldiers as have obtained an honourable dismissal from the Roman service. One of these was found in Yorkshire, near Sheffield, and is published by Camden, but incorrectly, as has been recently ascertained by comparing it with the original plate. The inscribed monuments further furnish us with some curious particulars relative to the mythology of Roman Britain. Thus, the Romans, coming to a picturesque stream in Yorkshire, the Wharfe, appear to have deified it under the name of Verbeia; and in some instances, with that spirit of adaptation by which they were distinguished, they appear to have dedicated altars to the indigenous gods of the Britons. The uninscribed remains of Roman art found in Yorkshire afford rather negative than positive evidence of the social condition of that people. The absence of architectural remains of any consequence, excepting at York and Aldborough—the rarity of tessellated pavements, the debased and barbarous character of the scul

ture and ornaments—would, *à priori*, lead us to infer what we know from history, that the Brigantes were not conquered till some time after the subjugation of the south of Britain, and that their district, like the rest of the north of England, was held by the Romans only by a great and well-distributed military force, and not colonised by peaceful settlers, like the southern part of the province. A large portion of the Roman remains discovered in Yorkshire consist of enamelled fibulæ and other ornaments of a late period, which we may suppose to have formed the trappings of the Roman cavalry soldier. Among the most remarkable of such antiquities are those found at Stanwick, presented by Lord Prudhoe to the British Museum, and some discovered in Swale Dale, now in the York Museum. The Brigantes, or British population of Yorkshire, have left us traces of their existence in many parts of the county, but these remains have not been collected and examined with sufficient accuracy to enable us to ascertain the social condition of the race before and subsequently to the Roman conquest. Pursuing, however, the method of inquiry which has been laid down for the antiquities of Denmark, we may distinguish in Yorkshire, as in other parts of Celtic Europe, the antiquities of an age of stone, before the use of metals—the antiquities of an age of bronze, when that metal was in general use—and the antiquities of the subsequent period, when iron was substituted for bronze, and which corresponds with the establishment of the Saxons in this country. In the antiquities of the age of bronze we may discern the progress of Roman influence, distinguishing the work of the aborigines from that of the Romanised Briton.

French and German Painting.

The French paint man acting; the Germans, man thinking. French art is an art of action, because her people have acted; German, an art of thought, because her people have studied. French art is so signally popular in its character, that it might safely confide the favourable decision of its merits to the verdict of universal suffrage. German art, on the contrary, the product of study, appeals to the student and to the few; it needs a learned taste, to be understood; its walks are the secluded paths of meditation; it reaches the heart, not by the beaten road of the common understanding, but through the shadowy avenues of intuition and the mazes of the pure reason. French art is practical and actual, sharp and sparkling; German, dreamy, abstract and abstruse, and withal somewhat ponderous and pointless. The French paint a picture, the Germans think one out. The French paint events, the Germans poems. French art is physical, German metaphysical. The French make a figure speak through the action of the entire figure; the Germans concentrate the expression in the head, and make the face the mirror of the mind. The French take the world as they find it; the Germans refine, speculate and idealise, and hence their art is generic, typical and symbolic. French art lives in the busy world, German in solitude. Now, the best art has ever been philosophic. Leonardo da Vinci, from the marked purpose which runs through his sketches, was evidently building up an inductive art; and it is no less evident that his mind was fed and fertilised from the inner wells of a deductive philosophy. The same was true of Raphael, and is equally true of the modern Germans. German art is marked, however, by an excess of self-consciousness. There is a class of thoughtful people who are termed "absent," and in such characters German art abounds. The figures seem lost in reverie and abstraction; they are revelling in the mazes of imagination, or overpowered by the intensity of inwardly originating feeling; and thus absorbed they become, in fact, unconscious of the outer world.

Rock Tombs at Tlos, in Lycia.

Tlos is a most delightful place. Few ancient sites can vie with it. Built on the summit of a hill of great height, bounded by perpendicular precipices and deep ravines, commanding a view of the entire length of the valley of the Xanthus, the snow-capped Taurus in one distance, the sea in another, the whole mass of Cragus and its towering peaks and the citadel of Pinara in front, itself immediately overhung by the snowy summits of the Massicytus—a grander site for a great city could scarcely have been selected in all Lycia. Pinara has perhaps more majesty, but there is a softness combined with the grandeur of Tlos, giving it a charm which Pinara has not. The acropolis hill terminates on the north-east in perpendicular cliffs. These cliffs are honeycombed with rock tombs, some of which are of great beauty. The older tombs are similar to those at Telmessus; but there are others, of an apparently later period, having their chambers excavated in the rock, but with their doorways regularly built. Such tombs have often long Greek inscriptions. The oldest tomb, to all appearance, at Tlos is the largest and most interesting. It is a temple tomb, fronted by a pediment, borne on columns of peculiar form and Egyptian aspect, having no carved capitals and being wider at the base than at the upper part. From such columns the Ionic

might have originated, for we can hardly suppose this, apparently the most ancient and important tomb in Tlos, to have been left unfinished. Within the portico is a handsome carved door, or rather imitation door, with knocker and lock, on each side of which are windows opening into large tombs. On one side of the portico is carved a figure, which we may recognise as Bellerophon, mounted on Pegasus, and galloping up a rocky hill, which may represent Mount Cragus, to encounter an enormous leopard sculptured over one of the tomb entrances on the right side of the door. This animal may be a form of chimæra, but presents none of the mythological attributes, and is in all probability the representation of a "caplan," the leopard which infests the crags of Cragus at the present day. An ornamental flourish appears on the door side near the leopard, and is repeated on the corresponding panel on the other side, but there is no animal carved on that panel. On the panels beneath the tomb are carved dogs, and there are also traces of others on the pediment. Pegasus is a Persian horse having a topknot and knotted tail. A saddle-cloth of ornamental character has been painted on his back. The group of figures appears to have been originally painted. The head-dress of Bellerophon is very peculiar, as also the arrangement of the beard. The eye is rather full, and Greek. There is no inscription on the tomb. A few feet from it, on a level with the pediment, is a Lycian inscription in a panel on the rock, the characters of which are much larger than any met with elsewhere. Two other Lycian inscriptions occurred at Tlos, one on a tomb on the opposite hill, and another on one near the base of the acropolis hill. None of these had been previously noticed. In a field at some distance is a quadrangular pedestal, or perhaps top of a tomb, on one side of which is a representation of Tlos itself during a siege. In this curious view can be recognised the disposition of the walls on the acropolis and of the more remarkable tombs as they are still to be seen.

The Fleet Street Conduit.

Upon it, says Stow, was a fair tower of stone, garnished with the image of St. Christopher on the top, and angels round about lower down, with sweetly sounding bells before them, whereupon, by an engine placed in the tower, they, divers hours of the day and night, with hammers chimed such an hymn as was appointed. This conduit was rebuilt with a larger cistern at the expense of the City in 1589. In the triumphal progress of Queen Anne Boleyn through the City of London on her way to Westminster to be crowned, pageants, as they were called, of various kinds were set up at all the conduits in her way, of which the principal were in Cornhill, Cheapside and the one opposite to Shoe Lane, in Fleet Street; all of these were newly gilt and adorned for the occasion, and those at Cheapside and Cornhill were made to run with wine instead of water. At the Cornhill conduit, Stow informs us that a poet sat to recite a new ballad in her praise as she passed. The conduit in Fleet Street, we learn from the same authority, was newly painted, and all the angels had their faces washed, and were made to look decent and becoming on the august occasion. Upon the conduit was a tower with four turrets, and in each turret stood a child representing a cardinal virtue.

The Destruction of the Mausoleum, Halicarnassus.

A detailed account of the destruction of the mausoleum by the Knights of Rhodes is given by Claude Guichard, in his work on the "Funérailles et Manières diverses d'ensevelir," printed at Lyons, 1581, lib. iii. 5, p. 379. In that most curious narrative it is stated that in 1522, when the Sultan was preparing to besiege Rhodes, the Grand Master sent some of the knights to repair the castle of St. Peter at Halicarnassus. Looking about for materials the knights found in the middle of a level near the port some steps of white marble. Making use of these in their repairs, and finding the stone good, they continued to excavate on this site. As they dug deeper they found the base of the building enlarge, and at the end of four or five days' excavation they came to an opening like the mouth of a cave, entering which they arrived at a great square room surrounded with columns of marble, with their bases, capitals, architraves, friezes and cornices carved in half relief, representing combats and histories. The knights were at first struck with admiration at the beauty of this work, but shortly after broke and destroyed the whole of it, using it as materials. Besides this hall, they found a door leading into another, as it were the ante-chamber, where was a sepulchre of white marble of marvellous beauty and brilliancy, which they had not time to examine, the trumpets having already sounded the retreat. On returning to the spot next day they found the tomb opened and rifled, and quantities of fragments of cloth and gold strewn about, probably the work of pirates in the night. "Thus," says Guichard, "this superb sepulchre, one of the seven wonders of the world, after having lasted 2,247 years, was discovered and destroyed by the Knights of Rhodes to repair the castle of St. Peter."

NOTES AND COMMENTS.

THE latest requirements of the Education Department with regard to all schools receiving aid from the Exchequer ought to have been enforced some years ago, and it is to be hoped no excuses on the part of managers and others will be tolerated. What is called the voluntary system may have its advantages, but it is cruel, in order to uphold it, to make martyrs of little children (who are incapable to understand what it means) by immuring them in unhealthy schools. If people cannot with State aid erect buildings that will at least be equal to Board schools in sanitary conditions, they should not be allowed to entice children. The new circular of the Education Department unfortunately allows some latitude to managers, for it says that the inspector need not press for immediate alteration in every case, and the words are sure to be taken as an excuse for a do-nothing policy. Money should be withheld for every shortcoming in the buildings. It is no excuse to say that the majority of voluntary schools were erected several years ago; with as much justice the managers might plead for a continuance of obsolete methods of education. When it is remembered that children have to pass several hours in uncomfortable positions, the playground of a quarter of an acre for every 250 children is not an excessive requirement. Classrooms which are less than 18 feet by 15 feet are unsuitable, and it is desirable that brick walls should not be less than 14 inches thick. Adequate ventilation and heating are also required as aids to teaching. There is no doubt that the realising of the conditions of the last circular will be a costly proceeding, but as the schools were upheld without aid from the State, the managers would not be in a worse condition if all the grants were expended on the buildings. In many cases it will be necessary to erect new buildings, but as voluntary schools are sources of satisfaction to the opulent representative of various causes, it may not be difficult to find the money that will be needed. If it be necessary to have zealous supporters among the poorer classes, care ought to be taken to make them healthy. The latest demand is therefore a kindness to the upholders of voluntarism, although it may at first appear oppressive. It is to be regretted the Education Act cannot become as stringent in respect of private schools and other educational establishments.

COUNTY Councils that propose to become their own builders would do well to study the last report on the Government buildings by the supervising architect of the Treasury of the United States. In it the proposed cost of all buildings under way is given, as also the amount expended during the year. If dividing the whole cost of all of these buildings by the whole amount expended during the year indicates the average time required to erect a building for the use of the Government, it would appear, says the *North Western Architect*, that the steady employment of about three journeymen and three helpers on the average building would carry the work along at the rate required to complete within this average time. As a full force of superintendents and inspectors must be kept in any case, everybody can see where one of the items that unite to make Government buildings so very costly comes in. If Congress were to refuse to order another building until those now under way are finished, and then work on the plan of ordering more only as the money is set aside for completing them, there would undoubtedly be a great gain in economy of building. It may be replied that in England it is not necessary to employ a regiment of superintendents, as the workmen will become so proud of their privilege to take part in public works they can be left to themselves in safety.

THE French sculptor known as "JACQUES FRANCE" has been fortunate in escaping from punishment which he deserved. His bust of the Republic was supposed to be so typical it was adopted by the Government, to be set up in all the communes. M. LECREUX (for that is his right name) arranged for the reproduction of his bust with a M. LESERTISSEUX. Probably he forgot the transaction or fancied he had set aside the contract, for he made another arrangement with a M. PARROT. Unlike the two kings of

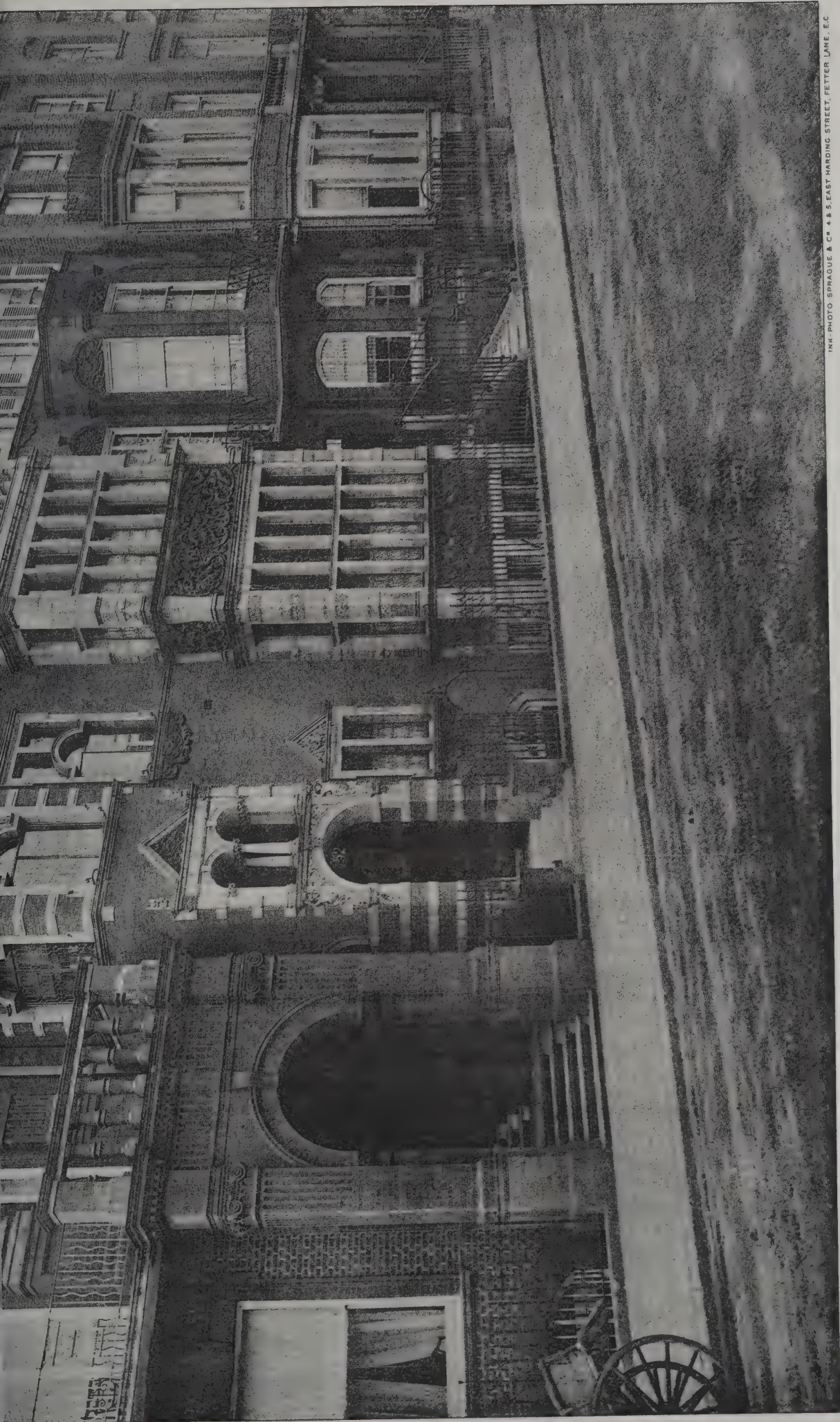
Brentford with their one rose, the two traders were not satisfied with their position, and all the parties became engaged in a lawsuit. The sculptor maintained that the first agreement was null and void, and that he had full liberty to enter into an engagement with M. PARROT for the sale of the right to reproduce the bust. The case came before the Tribunal de Commerce, and M. BINOT DE VILLIERS, an expert, was appointed arbitrator. After vain endeavours to persuade the parties to settle the dispute, the arbitrator decided that the original agreement with M. LESERTISSEUX was still valid, and could not be abandoned. The decision was considered by the sculptor to be tantamount to a doubt of his honour, and that he was supposed to be acting dishonestly. The arbitrator assured him there was no thought of criminality. The sculptor was not to be appeased, and, allowing his passion to rule him, he attacked M. BINOT DE VILLIERS, and with one of his tools inflicted several wounds. When M. JACQUES was brought to the police-court he declared that he was not guilty of a mere assault, as he wished to kill his victim. The trial, therefore, took place in the Cour d'Assises. There the sculptor pleaded that he had no intention to commit homicide, that the expert had annoyed him by his manner, and had even raised his arm to strike—all of which were denied by the sufferer. A doctor was ordered to report on the condition of the accused, and he found that the sculptor's mind was weakened by continuous excitement, and that his legal responsibility was diminished. As a consequence, the defendant was acquitted. In France there is not much sacredness about any office at present, but fifty years ago, if a litigant attacked a judge, he would not have been let off so easily.

OWNERS of dilapidated property will not hear with satisfaction of a decision given by Sheriff ERSKINE MURRAY. There is no reason why it should not be acted on in England. The case which gave rise to it was very simple, but very sad. In the outskirts of Glasgow are some dilapidated cottages which, in spite of their age, are not picturesque. Three days after Christmas a sweep was employed by the tenant of one of them. From the character of the chimney he was compelled to reverse the common order and work from above. The chimney gave way, and he was thrown to the ground, a distance of about 20 feet, and so grievously injured that in a short time he died in the hospital. The widow brought an action against the owners of the property, and was awarded 200*l.* with costs. An effort was made by the defendants—for landlords of their class are not scrupulous—to annul the action because the sweep was not licensed. As he was only a year without a license, the plea did not count. The Sheriff said that the owners of buildings are not to wait until their tenants report defects; it is their duty to have their property periodically inspected, and more especially when it is ancient. Contributory negligence was not admitted, and accordingly the defendants must pay 200*l.*, which probably is more than the value of the house.

NORTHERN caution has raised an obstacle to the final settlement of the claims between the Edinburgh Corporation and the North British Railway Company. It will be remembered that, after an arbitration, it was arranged that the company were to pay 25,000*l.* for those parts of the Princes' Street Gardens which are needed for an enlargement of the Waverley Station. The money was lodged in a bank, but although the time has expired which was fixed in the award, the Corporation remain unpaid. The reason is that the parties cannot agree about the form of conveyance. Supposing the owners and occupiers of the buildings facing the gardens take actions for the loss of a pleasing prospect, who will be responsible for the damages? The Corporation naturally wish to be secured against having to appear as the defendants in any future actions, but the railway company are as little anxious for that position. Both sides maintain they have a right to be exonerated against all claims for compensation by the owners of houses in Princes' Street. The Courts may be able to settle the difficulty which delays the commencement of the operations.

The Architect, Feb. 3rd 1893.





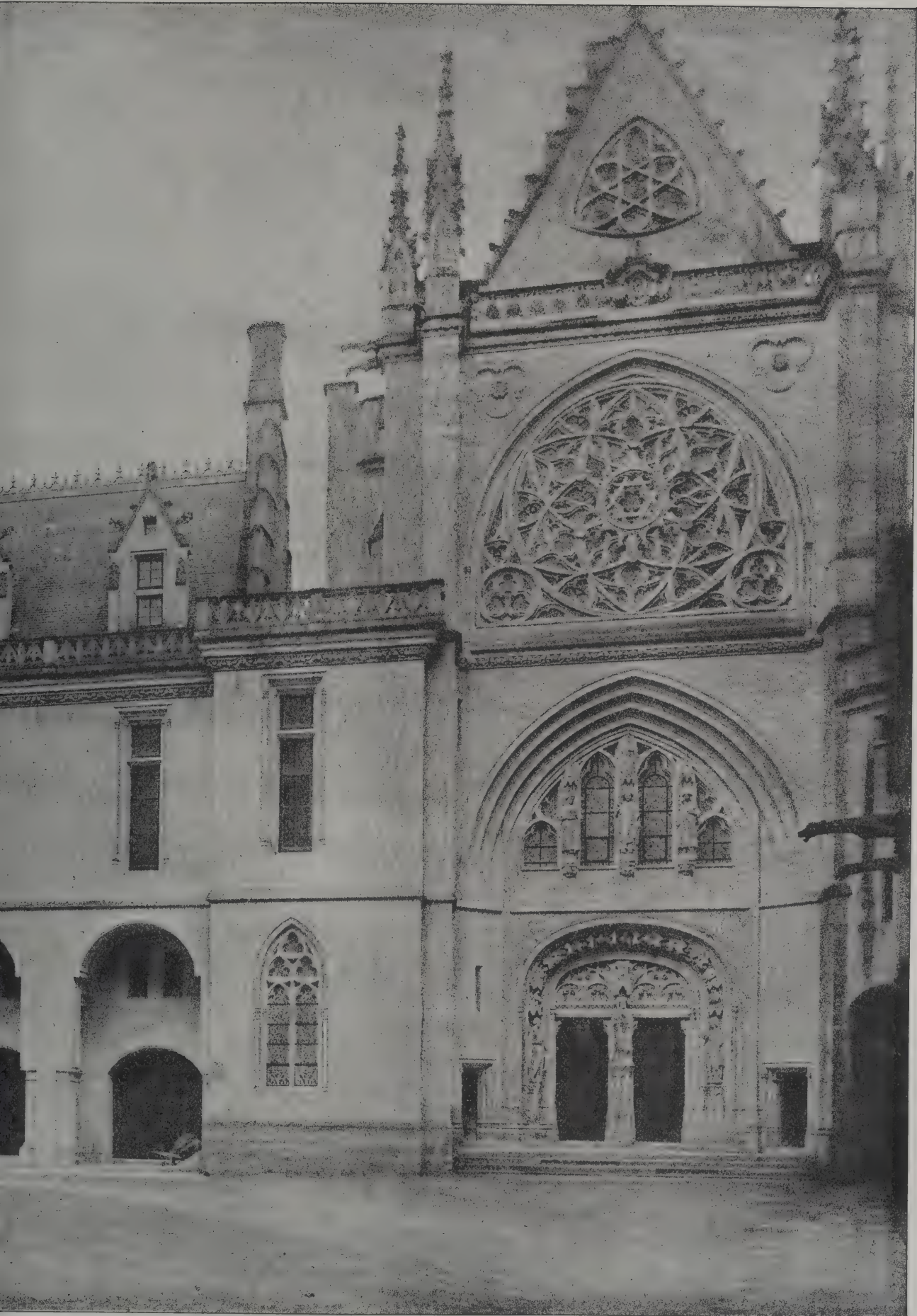
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52 CADOGAN SQUARE, LONDON, S.W.
Messrs. ERNEST GEORGE & PETO, Architects.



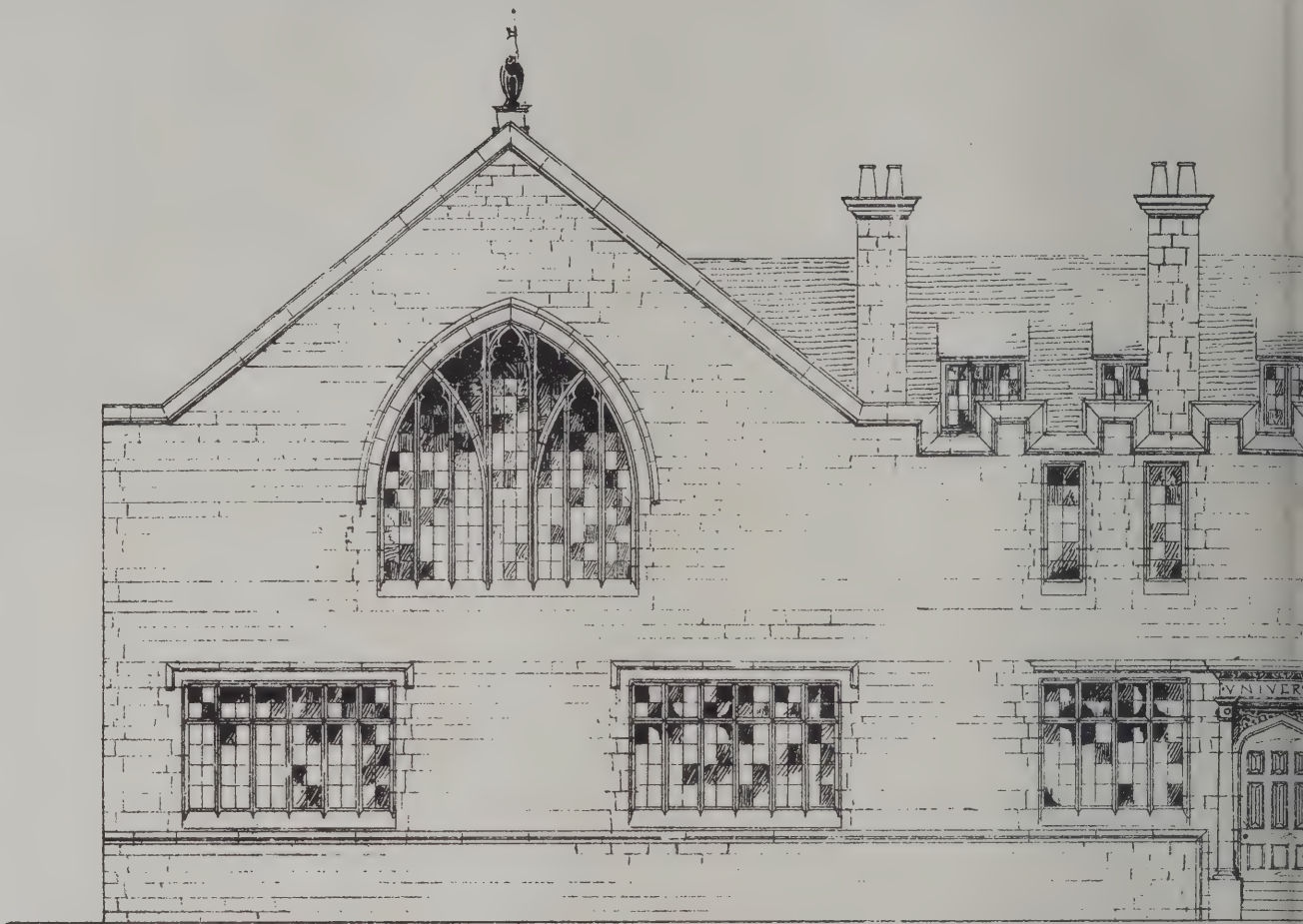
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Feb. 3rd 1893.

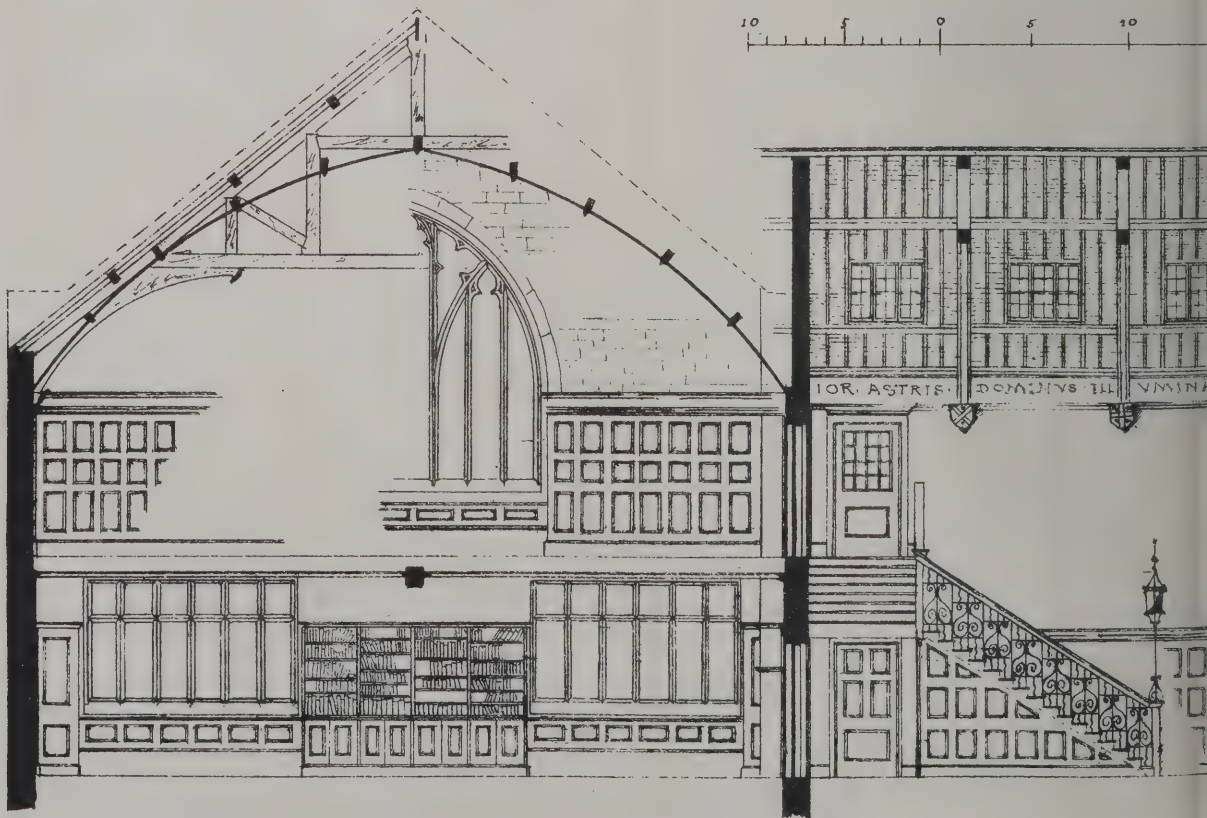


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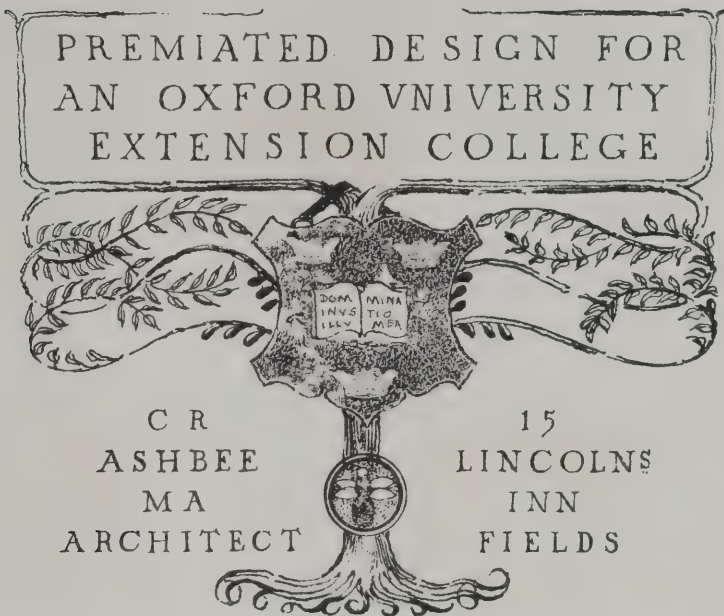
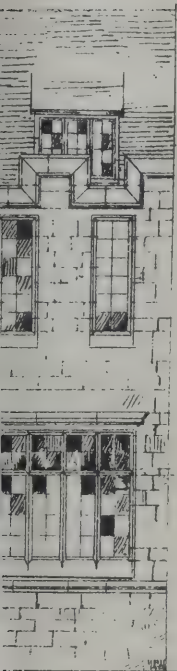
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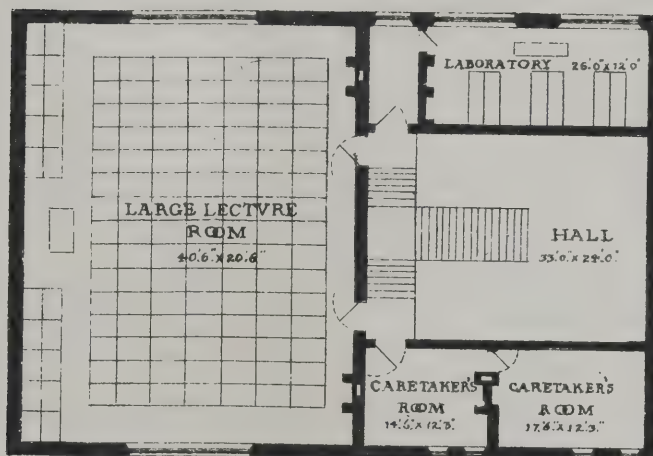
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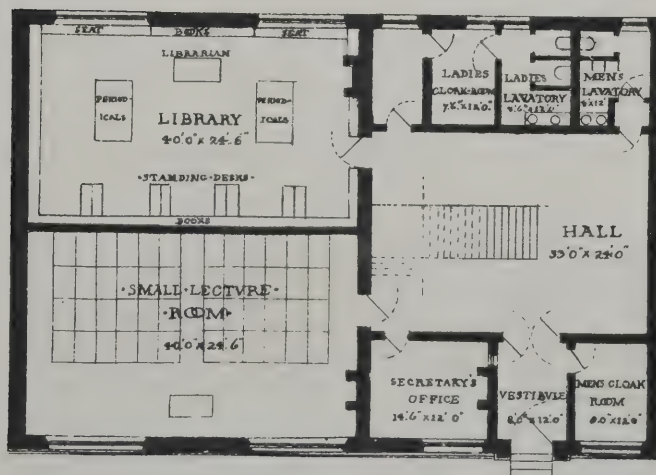
SECTION SHOWING LECTURE HALL LIBRARY AND ENTRANCE



FIRST
FLOOR



GROVND
FLOOR



E HALL

ILLUSTRATIONS.

52 CADOGAN SQUARE.

THE improvement of Lord CADOGAN's estate has given opportunities to several architects to depart from the established type of West End house. Cadogan Square is one portion of the estate where a comparison between many designs can be made. We give to-day a house by Messrs. ERNEST GEORGE & PETO, and the illustration will suggest that their buildings are as effective and attractive in the solid as they appear in the picturesque drawings in which they were first revealed.

THE CHATEAU OF PIERREFONDS.

THE illustration shows another part of the court, including the chapel, which is situated nearly at right angles to the part lately given.

PREMIATED DESIGN FOR AN UNIVERSITY EXTENSION COLLEGE.

THIS design was prepared as a pattern plan upon which, subject to the modifications suggested and the requirements needed by any flourishing university extension centre, further and more specific plans might be based. The following data were assumed:—That (1) an average flourishing centre would need accommodation for 200 students in one large hall, irrespective of the other classrooms. That (2) the centre, even if flourishing, would be impecunious, and all architectonic effect would have to be got inexpensively. That (3) the centre might reasonably be situate in a well-to-do country town; and that therefore (4) the land procurable would have to be economised, and would probably be of the nature of ordinary street frontage, with a depth of say 50 or 60 feet. That (5) all planning should admit of the possibility of later expansion. The building as shown could be provided for a sum of 2,000*l.*, subject to the possibilities of the district as regards building material, stone, brick, &c., and exclusive of the internal fittings, for which another 500*l.* might be reckoned. It provides the following:—A hall, a vestibule, a secretary's office, men's and ladies' cloak-room and lavatory accommodation, a small lecture-room, a students' library, a large lecture-room, a laboratory and caretaker's apartments. In the style chosen it was the endeavour to express three things:—(1) Strict utility, as, for instance, in the square forms of the windows and the large light of the lecture-hall, &c.; (2) the idea of continuity from the universities, the architectural treatment being such as to carry out the idea of expansion expressed in actual stone in the buildings of Oxford and Cambridge, even as the extension movement is the social and literary expansion of the universities over the country; and (3) in the style indicated, namely, that fusion between the late Gothic and the Renaissance, though liberally treated for modern purposes and though the most strictly utilitarian, a reference to that earlier and greater extension of the universities when COLET lectured at Oxford and ERASMUS led the new learning of Europe from his little cell at Queen's. The design, which is by Mr. C. R. ASHBE, M.A., architect, 15 Lincoln's Inn Fields, London, was exhibited in the last exhibition of the Royal Academy.

LICHFIELD CATHEDRAL.

PRIOR to the dedication of the new window in the north transept of Lichfield Cathedral on January 25, Mr. J. Oldrid Scott read the following communication to the congregation:—

In order to make clear the reasons which have led the Chapter of Lichfield Cathedral to carry out the alterations in the window which is to-day to be dedicated, it is necessary for me to explain the steps by which the transepts have reached their present form. I need say nothing of the Norman transepts for the good reason that nothing is known of them. Whatever they were like they ceased to exist soon after the middle of the thirteenth century, when they were rebuilt in an exceedingly beautiful variety of the Early Pointed style, which had then reached its highest perfection. It is hard now, to a casual observer, to picture to himself what must have been the appearance of the transepts at this time, but by examining the indications which remain of the many missing features, and especially by comparing the corresponding parts of York Minster,

a very clear idea of their original beautiful design may be obtained. The changes which have taken place are mainly in the upper part of the building, as the arches leading into the aisles as well as those carrying the central tower have never been altered. The windows at first were all lancets, with the exception of the rose-window in the south transept, and whatever corresponded to it in the north. They were very richly moulded, and had beautifully-carved capitals of an unusual type; the coupled windows which still remain in the west wall of the south transept may be taken as a fair sample of what once prevailed throughout. They are wonderfully perfect in their proportions, and in the delicate beauty of their mouldings, while the capitals are carved with the greatest boldness and originality. Similar windows once existed in the corresponding part of the north transept, considerable traces of which can now be seen on the outside face of the walls. Above these lancets was a noble range of clerestory windows, disposed for the most part in groups of three of equal height to each bay. These can also be traced outside the building. A similar range occupied the east wall of both transepts.

All of these windows have left some indications inside, as their jambs in certain cases were retained. The groining was of wood, and rose to a considerably greater height than at present. The wooden groining at Lichfield is referred to in an order by Henry II., which directs his master-builder at Windsor to follow the groining of wood lately erected at Lichfield. The whole design of the transepts was based on what had been built somewhat earlier in the century at York Minster. There, there has been no material change, the early windows and the beautiful wooden groining remaining untouched, while the rich rose window in the gable of the south transept, which here has been hidden by the later groining, there forms a conspicuous feature in the design. I need not say that, while taking the transept at York as their model, the builders at Lichfield adopted a far smaller scale and simplified the design in many respects. Those of you who have ever ascended the spiral staircase in the south transept must be familiar with the finely-moulded wheel window, with its singular tracery and flanking arches, which occupies the whole of the gable and is now inside the roof. In old days it was certainly seen from below, above the series of stately lancets which then stood where the large tracery window now does.

The architectural effect of the early transepts must have been noble in the extreme, and one cannot help regretting that the builders of a later period should have obliterated so much that was beautiful. The great change which produced the present aspect of the transepts took place some time in the fifteenth century, and it seems probable that the chief object the builders had in view was, by substituting stone for the old wood groining, to make the cathedral more secure against fire, and it is very probable that it saved the cathedral from more complete destruction during the sieges in the seventeenth century. In order to vault the transepts with stone it was necessary to alter the form of all the upper range of windows. The wooden groining to which they were adapted must have been of the peculiar kind one sees at York, a large part of it being of the nature of a barrel-vault springing from a horizontal cornice above the clerestory windows. These windows were arranged, as I have already said, in groups of threes, of equal height, and as this was incompatible with the side arches or wall-ribs of stone groining, the lancets were taken down, and the windows which we now see substituted for them, one wide opening taking the place of each triplet. In doing this the jambs of the outer lancets were usually preserved, and the old archstones were reused to the new form, so that we find all through the transepts Perpendicular window arches with Early English mouldings. Great skill was shown in this work of transformation, and the groining introduced is of especially fine design; it is very bold, the bosses being unusually large, and the ribs finely moulded. The treatment of the side windows also was very successfully carried out.

At this point, however, it is necessary to stay one's admiration, for in dealing with the great groups of lancets towards the north and south, the artist's hand seems to have lost its cunning, and though the same system of reconstruction was followed which had produced such a good result in the side windows, the effect was by no means so satisfactory when the wider spaces had to be dealt with. The outer jambs were again retained and the old arch stones reused, but the height available from the top of the jambs to the point of the new vaulting was so small, while the width to be spanned was so great, that an arch of extremely low proportions resulted. The problem was somewhat better dealt with in the south transept than in the north, where the arch was of a most uncouth and irregular shape. Its redeeming feature was the beautifully-moulded Early English stones of which it was built, and probably its tracery was at first very much finer than as it came down to us, while it was without doubt filled with the noble stained-glass which belonged to the fifteenth century. It has always been said that the tracery was destroyed during the sieges and renewed by Bishop Hacket, but it would seem

that he did but very little to those two windows, for the bill paid by him for what is called "making them up" has lately been found, and the sum charged for them together is only 5/. After allowing for the difference in the value of money the sum is still so very moderate that comparatively little reparation could have been required.

I have described the architectural faults in the two large windows, and especially in the northern one, but there was also a far more serious structural defect. A flat arch is always extremely weak from being liable to sink in the middle and to spread outwards on each side. This subsidence is what had taken place to a serious extent in the north transept and to a lesser degree in the south. The ancient gable remained over the north window till near the end of the last century. It was of the full thickness of the wall below, and its great weight had crushed the flat window arch by a downward and outward pressure, doing much injury to the tracery and thrusting the side walls outward. We find that efforts were made at different times to stop this mischief by means at first of an iron tie bar alone, and in 1797 by rebuilding the gable at half its original thickness, making it rest on what is called a relieving arch, tied across by a second iron bar. The bill for this work has lately been discovered. In the south transept the tendency of the side walls to spread was checked by building the huge buttresses which so much disfigure this part of the cathedral. This was done by the celebrated James Wyatt. Thus we see that the stability of the structure was much reduced by substituting the two great windows for the lancets which preceded them, for I need hardly point out that a series of lancets divided by strong piers of masonry is infinitely more substantial than wide windows, with all the essential weakness which they involve. This, then, brings me to the actual object of my addressing you to-day.

The failure of the north transept window, though no doubt stopped for a time by the measures taken at the end of the last century, was by no means cured; the relieving arch had in its turn given way, and the gable above was dangerously cracked, the spreading of the side walls was still going on, and the tracery of the window was ready to fall out any moment. It was, therefore, absolutely necessary to take some active measures for putting a stop to the mischief which had been in progress for so many years, and for making this part of the cathedral permanently sound. Every attempt which had already been made to counteract the spreading of the wide arch had failed, because the arch itself had been retained, and it became a serious question whether it would not be the wisest plan to cure the evil, once for all, by removing its cause. An architect in considering a matter of this nature has to look at it from more than one point of view. An antiquary is right in looking solely to the maintenance of the building exactly as it has come down to us, with every evidence of the changes it has passed through intact, and happily, in the great majority of instances, these are also the lines on which an architect can act; but there are cases, such as the present, where he is at the same time bound to consider the appearance, and still more the stability, of a building, no less than its architectural history. Here, in dealing with the north transept window, there was, first, the absolute necessity of stopping the settlements in progress, then the fact that this window was an exceedingly unsightly one, both within and without, and finally the most interesting antiquarian fact, which in my opinion infinitely surpasses the historical value which the old window had, that the lovely design of the ancient lancets could be recovered with absolute certainty, and that in a great measure they could be rebuilt, stone for stone, out of their original materials. Had this window been the only one altered in the fifteenth century, and subsequently restored by Bishop Hacket, its removal would have been a very serious loss; but it is only one out of a considerable number; about fifteen others were so altered, and nearly forty were restored, the whole of which will remain as witnesses of the changes which have passed over this part of the cathedral. They are in good condition, needing nothing beyond ordinary repairs, so there is no reason why they should ever be interfered with. The exception is the great window in the opposite transept, but here, happily, the mischief is not very serious, and can, I fully hope, be dealt with by other means. The window itself is also far better looking than was the case in the north transept, and the tracery has not perished to anything like the same extent.

We claim, then, that in altering this window to the form in which you see it to-day, we have removed a dangerous weakness in the building which had been in progress ever since the tracery window was first introduced. We have removed a feature which was architecturally a serious blot on the beauty of the cathedral, and while doing this we have recovered a lost beauty as lovely as can be found anywhere, except indeed at York, where the noble Five Sisters, as they are always called, were doubtless the model on which they were originally designed. So far from obliterating the history of the building, we have surely made it far easier to decipher than it ever was before; for here in one transept is the window as the thirteenth-

century builders erected it, and there, in the other, is the window altered and adapted in the fifteenth, while everywhere around remain untouched innumerable traces of the restoring hand of the great Bishop Hacket.

I have only to add that the evidences we found for the design of the lancets were of the most complete and unmistakable kind, leaving nothing to be imagined by the architect, and requiring only patient and careful investigation. This has been bestowed on the work in ample measure by the excellent cathedral mason, Mr. Bridgeman, to whom, after the lamented donor more than to any one else, the credit is due for what has been done. In addition to the numerous ancient stones which were clearly visible in the great arch before the work began, others were found embedded in the walls in great numbers. They have all been used in the reconstruction, and it is satisfactory to know that out of the hundreds of stones forming the five beautiful arches above us, only twelve new ones were required. It is the earnest hope of those responsible for the work that if some sacrifice has had to be made, as well as some departure from the usual canons of strictly conservative restoration which guide us in our work here, it will be generally acknowledged that the gain has been far greater than the loss, and that the peculiar circumstances of the case have more than justified the steps which have been taken.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE fourth lecture of the new series was delivered by Mr. John James Burnet, A.R.I.B.A., the subject being "The Relation of the Architect to the Craftsman." After briefly referring to the question of the training of architects, and the recent discussion as to whether architecture was a profession or an art, the lecturer discussed the various points between architect and craftsman. In this connection it was noted that there were two classes of contractors; the one class who were craftsmen, and the other who merely employed craftsmen, and who, in the opinion of the lecturer, were on the decrease. The system of open tendering, while having its drawbacks, was not entirely an evil, the lecturer demurring to the reflection often passed on architects and clients that really good work was by this means often found to be underpaid. In conclusion, the question of machinery was touched upon, a general knowledge of which, so far as concerned the building trades, was considered by the lecturer as of importance to the architect. A discussion followed, and at the close a vote of thanks was awarded the lecturer.

CASTLE BROMWICH CHURCH

AT the last meeting of the Archaeological Section of the Birmingham and Midland Institute, Mr. C. E. Bateman read a paper upon Castle Bromwich Church. He acknowledged the assistance Mr. Cossins had rendered in the investigations, without which it would have been impossible to have arrived at so certain a conclusion as to the form and appearance of the earlier timber church, incorporated in the existing Renaissance structure, built at the cost of Sir John Bridgeman between the years 1726-31. The length of the present nave being divided into six bays, Mr. Bateman had discovered that the four easternmost comprised the extent of the former one, the present roof being carried by the east and west gable ends, still containing the upright exposed timbers and plaster, with seven intermediate trusses of most massive construction, and only 5 feet apart. The present three easternmost columns of plaster contain the oak posts which carried the ends of the principal trusses, the intermediate ones being carried on the head and cill pieces of the clerestory, which contains the original windows, timbering and plaster, now covered up with modern plastering. The clerestory indicated that there were aisles, and fragments of timber found in the roof, and used for ceiling joists and rafters, proved that they were timber also, and the appearance they had both inside and out. The roof of the chancel is modern, but the lecturer contended that the old chancel was of the present form, owing to the stone walls being found on the removal of the dado panelling, with plaster on some portions of the surface, and because churches of the eighteenth century were not usually built with chancels of so large proportions. That there was a rood over the opening into the chancel is almost a matter of certainty, owing to the large projecting moulding being worked on the inside face of the east gable, which would carry the crucifix and supporting figures, and also because the niche truss in front of it is raised higher than the others, which would be for the purpose of being better seen by the congregation. In one of the chancel windows is a fragment of painted-glass, the only piece now existing from the former church. A large amount of old timber was utilised in the construction of the floors in the

tower, and Mr. Bateman thought the bell-framing was the same that carried the old bells. In conclusion, Mr. Bateman referred to the old account-book, which contained many items for repairs to the old church, some of which were afterwards further explained by Mr. Hill, who showed the audience the pre-Reformation patent now used in the weekly celebrations, also paying a tribute to the architect who designed the rebuilding of the church, which is of such fine proportion and detail inside and out, when he was tied and hampered by the form and construction of the former timber building. Mr. Bateman illustrated his paper with numerous photographs of the existing church, measured drawings of the old structure, and views of the interior and exterior, showing its appearance before 1726, and was assisted by Mr. Harold Baker with his lantern. In moving the vote of thanks, Mr. Doubleday referred to the care that had been taken in the investigation and preparation of the drawings, and was supported by Mr. Churchill; also Mr. Hill, who referred at some length to the accounts, and Mr. Cossins, who said it had been a great pleasure to him to assist Mr. Bateman in his discoveries.

THE ORIGIN OF BUILDING.*

IN dealing with the subject which is to be considered this evening, I have thought it advisable to avoid the very dry studies or a technical student's lecture as far as I possibly could do so, and this will account to you for the omission in various places of numerous technical terms which you may notice as we proceed. Without further preface, therefore, I propose to give now a history of architecture and building, as far as possible, from its earliest conception and development and the various styles of architecture. It is generally accepted that architecture may be divided into five classes, viz. Prehistoric, Barbaric, Classic, Romantic and Revived Classic; these are again divided into twenty styles, and from some idea borrowed from any of these styles have been erected the buildings we see around us at the present day.

There is a marvellous difference between building and architecture and building, and I may state building was originated ages before architecture. Building was one of the first laws of nature—a covering, a habitation, was, after the Garden of Eden, a necessity for man, savage or civilised; therefore we find that from time immemorial huts or roofs to shelter human beings from the weather have been a necessity, even to the most ignorant of mankind. Some of these coverings used curiously enough very frequently to take the shape of an umbrella and a dome-like or circular form, and was composed of bent twigs covered with leaves, so that protection from the weather was the mother of architecture. This being the origin, we must trace it as far as possible in the short time we have through its progress towards perfection. Different occupations and conditions of mankind necessitated different sorts of dwellings and buildings; thus, it would be very ridiculous for we in England to build on the same lines as those in India or Africa, so architecture is sometimes defined as the art of building to the requirements of mankind. Building, as I have already explained, is older than architecture, it is older also than sculpture, but building combined with sculpture produced architecture, so that the architecture of a people (and with this I have been very much struck) is an important part of their history, or as one historian has it, "it is the external and enduring form of their public life, an idea of their state of knowledge and social progress." So to be understood properly we must consider architecture and building historically.

Again, ornament, I take it, is an essential part of architecture—without it there can be no true architecture, only building. I hope you will not misunderstand me here. I do not mean to say that a building should be erected for the sake of art and ornament, that would be a misconception; but it is essential that we keep clearly in mind throughout that there is a great difference between "architecture" and "building," and I have thought it my duty to thoroughly demonstrate this before plunging deeply into the work before us. To distinguish, therefore, architecture from building, we have from the earliest ages when man first began to think and beautify a gradual building up of those classes and styles of architecture to which I have referred and from which our buildings are designed. It is very well known, I think, that refinement (architecturally, at any rate) matured in the Eastern world ages before the Western. While the rude savages of the Western world huddled in caverns and holes in the earth, the Eastern races were erecting noble edifices. And by the word Eastern I do not mean simply Asia; but, crossing the Pacific Ocean, I refer also to Mexico, where, if it be possible to definitely place that much-debated and very slippery subject, "where architecture

or building really did originate," there is some reason to believe that it existed in Mexico even before it existed in Asia, but before arriving to this mankind must have passed over ages. "Every nation produced its own art or style by employing the various materials within its reach and by giving them such forms as their wants required."

The early peoples of this earth, starting say from Asia, could have but little idea of architecture or even of sound construction. They were wandering and pastoral tribes like the Hottentots, and lived in tents and wretched huts which had no pretensions to architecture. But my subject to-night is not the early history of our race (although it is closely allied), but the origin of building, its progress and development, so I must pass. About the oldest building with design about it that is known is the temple of Juggernaut in Southern India. The Brahmins attribute its foundation to the first king on the coast of Rissa, who lived, according to their chronology, 4,800 years ago. This, I am afraid, you must take with the proverbial "pinch of salt." Although it may or may not be so old as that, having doubtless been restored and partly rebuilt since it was founded, it is admitted to be exceptionally old, although not really completed until the eleventh century; and it is for this reason and of its being certainly of prehistoric origin that I give it here rather out of its place. I may have something to say as to this sort of building later on.

I have already referred to the first care of a people being to construct individual habitations composed of twigs and leaves, so the next step was to hollow out caves from the rock, or to pile stones one upon another and which were usually of a circular plan. Then came the erections for religious purposes, and the simplicity of these may be noticed in the construction of the altars of extreme early times. The first sacrifices the Bible and ancient tradition show were made upon consecrated piles of stones, which were collected upon high places. These altars, called "Bethel" (the house of God), were erected in Chaldea, in Judea and in Egypt. They were built (according to the Scriptures) of stones without cement, if the places where they were raised afforded the proper material. In other parts they were constructed of turf and earth, where the plain country around had no solid materials. Such erections or mounds are found in Asia Minor and in Judea. At Heliopolis, celebrated for the worship of the sun, a very great number of altars had been erected to various gods.

From the Eastern parts this simple manner of building, as applied to primitive altars and the sacred enclosures surrounding them (called the Phœnician prehistoric style), after having been developed in Asia and in North-Eastern Africa, extended into Europe from the borders of the Black Sea, and reached Gaul (or France) and also England, and are known by the name of Celtic or Druidical monuments, and a fair idea may be had of this construction from the scene of Stonehenge, showing the Druidical remains, no doubt originally used for religious purposes and enclosures. Numerous examples of this primitive construction are found in South America, supposed to have been erected long ages before Columbus or the Red Indian. We see a number of square pillars supporting enormous entablatures or architraves, the whole appearing to have constituted a large and well-constructed place (for the period). These evidences of the first attempts of past civilisation are fast disappearing, even where they still exist, as when the nations commenced to progress and improve they, very naturally, swept away the old primitive erections, just as we do in modern times, and using the material, where possible, for new constructions.

The system of construction which we have before us was gradually developed from its extreme primitive style to another form, very similar, but showing a step forward in the construction of the arch, combined with the piling of the stones. This leads us to the Pelasgic prehistoric style. This early system, noted for the rudeness of its form, its stability without mortar, and the great size and irregularity of its material, is attributed to the Pelasgians, a people originally from Upper Asia, who spread themselves over Phœnicia and Asia Minor and colonised Greece and Italy. This style of construction is also, very remarkably (and to this I will ask your special attention), found in different parts of America, principally in Mexico, taking the form somewhat of the pyramid, giving an idea that the early races of America had close connection or relation to the races of the East, as, even in this rough construction, the stones receded as they ascended for the purpose of stability, and forming the basis to which Eastern nations clung for ages in their construction, and the basis afterwards for the great Egyptian pyramids, which I hope to place before you shortly.

Perhaps the best example of Pelasgic prehistoric architecture that we have unearthed are the ruins of Mycenæ. In the upper half of the view we have an example of a horizontal arch formed by horizontal layers or covers of stone overlapping until they reach a point of contact. The lower part of the view is the Lions' Gate at Mycenæ. The gigantic remains of the Pelasgic monuments chiefly found in ancient Greece, when examined by travellers, bear traces of different modes of build-

* *The Origin of Building: Its Progress and Development. A Non-technical Review of the World's Architecture.* A lecture by Mr. Howell J. Williams, read at Anderson's Hotel on Thursday, February 2, before the members of the Olavian Society.

ing. Those which seem to be the most ancient are composed of large blocks of stone, or large pieces of rock, some being described by ancient writers as being so strong and of such large dimensions that a yoke of oxen could not shake the smallest of them, and this, remember, 3,600 years ago. It makes one wonder how they did it, and how we should be able to do it if our modern machinery and tools were taken from us and we had to do it without.

It is obviously exceedingly difficult to produce views of this extreme early stage, or to get accurately at the state of things in prehistoric times, and it will be readily understood that it has been very perplexing for the most learned writers to get at the absolute facts, but by some means or another we have been fortunate to have preserved to us a view of a group of Pelasgians, and I do not think it out of place to introduce these early originators of architecture, without prejudice (as the lawyers say) to the fact that the likenesses may not be strictly accurate, but a fair sample (I hope) of the race. These Pelasgic peoples, moving on from the Asiatic countries, one branch going further west (even, as some surmise, to Mexico, or possibly having come from Mexico and other parts of America), other tribes marching south and east, so that their influence is seen in India and Persia as well as Egypt, carried their methods of construction with them, for it cannot but be concluded that, without these original efforts in unhewn stone, these peoples would be unable to give to their ancient buildings the architectural effect which they did.

Turning from stone to wood, for the moment, one of the earliest accounts of building we have is that of Noah's Ark. There is a wonderful design about this construction, and I am sure you will agree with me that it should take its place in any history of early building and architecture. So we see on the screen a view of Noah building the Ark. I am not going to venture to say, however, to what branch or style of architecture it belongs. For an account of this notable construction I refer you to the Bible. I suppose, however, without joking, that Noah's Ark may be taken as the foundation of the system of naval architecture.

About the earliest record of a change in building from stone is found to have occurred in Chaldea (and here the professors have to go to the Bible for facts and truths that can be relied upon), for the want of stones in Mesopotamia, as a necessity (the mother of invention), taught the inhabitants to make bricks, and the first record we have of the use of bricks is in the construction of the Tower of Babel, which is the most ancient tower mentioned in the Bible. This building was an immense pyramid, built of bricks piled up tier upon tier. Up at the top of this place they used to sacrifice to Baal. At a later period the Chaldean kings used to place their statues there (when sculpture was allied with building). This pyramidal style seems to have held its influence for generations afterwards, even when these races had become very clever in the art of building, for the celebrated Hanging Gardens of Babylon (accounts of which one meets continually in research upon a work of this description), which were formed of numerous terraces one above another, had also this style, and even in the later Grecian buildings its influence is seen.

Before passing on to the next class, I will just name the four styles again that comprise the prehistoric class, and I have had specially prepared the view on the screen to illustrate them side by side, so that we may compare and take them in at a glance, as it was upon this foundation, so to speak, that the noble edifices of the world have been erected. The four prehistoric styles—Phœnician, Pelasgic, Celtic, Etruscan.

We now pass on to the next class, the barbaric, those ancient erections of durable materials showing a knowledge of systematic construction of which we have authentic record and present evidence in their ruins and specimens. The earliest records of the first city that contained durable edifices are found in the Bible, and without the Bible our knowledge of even historical facts would be exceedingly mean indeed. The first city that I refer to is Nineveh, the capital of the Assyrian Empire. A view of Nineveh is now before us. This ancient city is described by the old records as having been very large, even larger than Babylon. In Jonah iii. verse 3, it is described as an exceeding great city of three days' journey, the walls are said to have been 100 feet high, and so broad that three chariots might be driven on them abreast. Upon the walls stood 1,500 towers, each 200 feet in height. Nineveh, although thought by the Ninevites to be impregnable, was taken by the Medes 800 years B.C., when it was nearly destroyed, and again in 625 B.C., when it was totally destroyed. All that now remains of this once great city on each side of the river Tigris has the appearance of a range of hills, which are excavated from time to time, resulting in discoveries of statues and various pieces of sculpture. One really proved to be a statue of Cyrus, the Persian emperor; also fragments of buildings. But no doubt, owing to the great lapse of time, no connected building or part of a building has been brought to light at present. It may be of interest, as I have now the opportunity, to show a view of Jonah preaching to the Ninevites.

The next city, the name of which is familiar to us all, is Babylon. If you could turn to Genesis x. 10, you will find, referring to Nimrod, who is mentioned in the previous verse, "And the beginning of his kingdom was Babel," showing that Babylon was founded by Nimrod, the grandson of Ham, and became a city of very great magnificence. So great was the circuit of its walls that there was pasture and arable land sufficient to support the whole population during a long siege. In the walls were one hundred gates made of brass. The city was brought to its highest degree of perfection by Nebuchadnezzar, 600 B.C., but about sixty years after the death of that monarch, and during the reign of Belshazzar, it was besieged and taken by Cyrus; from that time it gradually decayed, and became afterwards a part of the great Persian monarchy. The ruins that have been discovered confirm the old accounts of its splendour, although nothing now remains except large masses of brickwork, with lime mortar still of good quality (no jerry work there). Among the ruins have been discovered fragments of alabaster vessels, pieces of sculptured marble and great quantities of glazed tiles, the colouring and glazing still fresh. Of what date these are it is of course impossible to know, but it has been proved that in the time of Semiramis, queen of Assyria 1665 B.C., an extensive and magnificent palace existed on each side of the river Euphrates, connected by a tunnel under the river. How wonderfully history repeats itself! When the Thames Tunnel was carried through by Brunel it was thought a wonderful thing, and possibly thought to be the first of its sort, as at this time these facts were not known. Babylon spread over each side of the river, like most of our modern great cities, and was also connected by a bridge. The piers were of large hewn stones, in order to erect which the course of the river was diverted, and its bed left dry. Of all the mighty buildings of the Babylonian empire we have only ruins, and the history of these is being dug up year by year. The various nations coming in contact with the Assyrians were naturally influenced in their architecture by them, and it is probable that Solomon, in building the Temple, was ruled by an Assyrian architect, the building being more or less of that Eastern style—a work of great magnificence.

I now pass on to the next style of the barbaric class, viz. Egyptian. At an early period the Egyptians were extremely skilful in working stone, an art in which they have never been surpassed. The large blocks of stones of which their temples are composed are well squared and so laid that the joints are scarcely visible, but so massively and solidly were their buildings constructed that some grand specimens remain to this day. Ancient Thebes, next to Athens and Rome the most important city of antiquity, was the capital of Egypt, and its most flourishing period was the age of the Pharaohs, 1200 B.C. This was really the first great building epoch in the East, as Nineveh and Babylon were then in their most flourishing condition also. We are told by travellers that Egyptian Thebes presents the most extraordinary group of ruins in the world; ruins of enormous size and covering a vast area. The ruins are mostly temples or temple palaces. A view on the screen shows an avenue at Karnac, one of the villages that now occupies a portion of the site of ancient Thebes, which is now buried deep in sand and earth, the specimens of buildings I show having been excavated and cleared of the sand. In order to form an idea of this portion of the gigantic buildings at Karnac (the Hall of Columns), we must imagine a hall 300 feet wide, in which are erected long rows of thickly-set columns, 150 of enormous dimensions, and in all probability erected 2,000 years B.C., i.e. 3,800 years ago.

We are almost constrained to admit that the ancient builders beat us completely; but it must also be admitted that the style of the Egyptian massive construction, though specially suited for the Egyptians, would not be suitable for modern times, when land is scarce and valuable and labour costs money. The hall is about one-seventh part of the whole edifice at Thebes; the heads of the columns are bud-shaped, and are also entirely covered with incised and painted hieroglyphics, producing a wonderful effect of barbaric splendour, and these paintings are mostly as fresh now as if painted but a few weeks ago. The height of the columns are from 40 to 60 feet, and the imperishable nature of the materials and the immensity of the masses has preserved the buildings for more than 3,000 years. At the present time the site of the ancient Thebes is occupied by four principal villages—Karnac and Luxor on the eastern side, and Gournal and Medinet-Abou on the western side of the river Nile, and the approach to Karnac from Luxor, a distance of a mile and a half, is lined with two rows of sphinxes.

The two principal characteristics of Egyptian architecture are grandeur and yet simplicity. Karnac claims to be one of the largest buildings in the world, and yet it is said to be one of the simplest. It had 100 gates, and the buildings and sculptures of this once gigantic city still existing are said to be the most ancient left in Egypt, and the most genuine and best specimens of Egyptian architecture and art; and there is every reason to believe that by far the greater part were executed before the Egyptians had experienced the influence of the

Greeks, and long before their invasion and being conquered by the Persians, 500 B.C. The principal remains of Egyptian architecture (chiefly temples) are to be found on the banks of the Nile, and extend from Cairo to Nubia, a distance of 500 miles. The entrance to the Rock Temple at Ipsamboul, in Nubia, is flanked on each side by two statues 68 feet high, carved out of the solid rock. Another temple is that of Edfou. This may be classed as restored Egyptian, not being of such extreme ancient date as Karnac, and yet flourishing centuries before Christ, and still in grand preservation. Our modern engineers are waking up to this question of durability, Sir John Fowler, the engineer of the Forth Bridge, probably the finest work of modern times, having said at the opening ceremony that he predicted that the bridge would last 1,000 years, and, if this be true, there is no reason why the Christian era should not yet erect structures to equal and even surpass the marvellous structures of ancient times. But of all the works of the ancient Egyptians, those that have caused the greatest wonder are the Pyramids at Gizeh. I have mentioned that from an early time the Egyptians were extremely skilful in working stone, and the view of the Great Pyramid gives some idea of their wonderful resources both in material and labour. It is 700 feet square at the base, and 407 in height. The Pyramids have been built in tiers or terraces, or blocks or steps one above the other, and the exterior cased in. The probable use to which they were put was a burial-place for the royal families and kings. About 300 paces from the Great Pyramid stands a gigantic statue of the great Sphinx, whose length from the fore part to the end has been found to be 125 feet. An explorer cleared away the sand and found a temple between its legs and another in one of its paws. Of the taste, style and character of Egyptian architecture little need be said beyond a word of admiration at the immensity of the works and the patience with which they must have been accomplished. Their monuments are admirable for grandeur and solidity, and have a most imposing effect, but the ornaments and sculpture represent a symbolic and barbaric religion of the Egyptians, and consequently admit of no rival except, as I have already said, in a question of durability.

I have now dealt with two out of the four barbaric styles, viz. Syrian and Egyptian, and the other two are of a certain similarity that I feel I need just mention. They are Indian and Mexican; Chinese is scarcely considered, though very peculiar. The cause is chiefly the wooden construction.

We now come to a class of architecture with which we shall deal mostly, and that is Classic. The four styles of architecture forming this class are Greek and Roman, or Pagan Classic, and Latin and Byzantine, or Christian Classic. We will take the Greek first. Greece was in very early times divided into a number of petty states, each independent of the others, and consequently rivals. As a means of protection they surrounded themselves with thick walls. Even before they learned to build temples and noble buildings the surrounding walls were called Acropolises, but scarcely any specimens of this extreme early Greek building are left. From these primitive constructions the Greeks progressed step by step into that glorious architecture and art that influences the world so much at the present day. Some of the oldest remains of ancient Greek construction exist at Mycenæ, near Argos, in the Morea. The date of the masonry is supposed to be coeval with the time of Abraham, 1917 B.C. The Greeks were only beginning these arts and constructions when the Ninevites and Babylonians were at the height of their civilisation, and it is most probable that these ancient Greeks received their first ideas from these Eastern parts, and by the study of Syrian and Egyptian architecture that I have just described. The walls of Mycenæ are mostly built in unhewn stone, each piece mostly from 8 to 9 feet in length, and when entire they must have been 60 feet high. The general thickness of the walls is from 21 to 25 feet. At Mycenæ there has been discovered a subterranean building which is known to have been the Treasury of Atreus, the father of Agamemnon. This chamber is cut out of the earth in the side of the hill, and then lined with stone, of a circular construction. This, again, was a step towards those stone buildings for which they became so famous. Before the time of Homer, 900 years B.C., there were few temples in Greece or Asia Minor, and the sacrifices were performed upon altars in the open air. These altars were in time surrounded by rude walls and enclosures without roofs. These gave way to architectural constructions with elaborate columns, as in the view of the temple at Paestum. After a time, as the forms of worship became more and more mysterious and (to the priests and people) more sacred, the ceremonies were concealed from the general public view by the temples being erected sufficiently lofty, and the still more sacred portions entirely concealed. The most ancient type of the Greek column, viz. the Doric, particularly in its commencement, is very like those of Egypt and Syria. If the capitals of the columns at Karnac were to be cut down, say, three-quarters, the remainder would be Greek Doric, and no doubt you see some resemblance in the columns in the view before us to the

columns at Karnac. The genius of the Greeks developed this first idea and enriched it with details that the Egyptians had neglected. The first principal characteristic of the Greek Doric is the nobleness and dignity of the whole order, the severe simplicity of its details and the moderate use of ornament. The columns have no base; the shaft is ornamented with wide yet shallow flutings. The name Doric came from Dorus, a king, the son of Helen, who built a temple of the Doric order, sacred to the goddess Juno, in the ancient city of Argos, near Mycenæ, 1,200 years B.C. Another example of the Doric order is the Parthenon, an example of highest beauty, according to connoisseurs of the architecture of Greece. The Parthenon is at Athens. This temple was dedicated to Minerva, and is supposed to have been completed in the administration of Pericles, about 460 B.C., and cost 1,000 talents, or about 100,000%, built of marble, eight columns at each end, one end seen in the view, and a long colonnade at each flank. The greatest glory of the Parthenon was the group of sculpture with which it was at one time crowned. From 600 to 400 B.C. was the most splendid period of the history of the Greeks. They had conquered all the neighbouring countries around, and their two principal styles of architecture, viz. the Doric (which we have just had) and the Ionic, each were influenced by certain conditions.

Ancient Athens stood midway between the western portion of the Greek states, where the Doric order was most favoured and flourished, and the eastern and Asia Minor states, where the Ionic order (of Oriental origin) was most used, and therefore was to a certain extent neutral ground, and favoured both styles. At Athens there was a high rock. There the early Greeks built those enclosing walls for protection to which I have alluded. Here they made their fortress, and it was here they found the high place for their altar. The massive walls would be a fortification and a protection against those rival states, and to which they could retire in case of need. This was of course before the city had grown to larger proportions. This place was called the Acropolis, and became the foundation for the future temples and notable buildings. Upon this Acropolis were erected (to show, I suppose, strict impartiality between the various states) two magnificent temples, the Parthenon, which we have just seen, and the Erechtheum, which we may take as an example of the Ionic order. The Erechtheum is a somewhat small building, at least compared with some of the massive buildings of Greece, and was built in the same century as the Parthenon, 400 B.C. Here we have one of the most beautiful specimens of the Ionic style of architecture. On the left of the building will be seen a small porch, the columns of which are human figures, caryatides, the most costly and elaborate form of support ever put into a structure. To make beautiful sculptured slaves and captives do the work of the columns and supports is an idea especially belonging to the Orientals and to antiquity. It is also perhaps worth mentioning that in the Doric male figures are used—massiveness and strength; while in the Ionic female figures—lightness, elegance and grace, an attribute belonging, I think, to the ladies.

Some time before the conquest of Greece by the Romans there came into use another style of architecture, called the Corinthian, which surpassed even the Ionic in delicacy of proportion and richness of decoration; but it was not used much in Greece previous to the Roman conquest, although it was afterwards under the fostering care of the Romans. There are some splendid specimens, such as the columns of the ruins of Baalbec. Greece became part of the Roman empire 146 B.C., except Athens and Delphi, which were declared as free towns. The Roman orders or styles of architecture were confined to the immediate neighbourhood of Rome, but are found in all parts of the Old World where the influence of Rome was felt. The Corinthian style was fostered by the Romans and encouraged by them everywhere. Their architecture, however, can scarcely be called original. It was borrowed from the Etruscans and Etruria (a province of Italy now called Tuscany), which was supposed to be a province of Greece, so that in two ways, by early settlement and by conquest, the Romans acquired their architecture from the Greeks. The Romans, of course, introduced new ideas and forms into their style of building, but the main origin is not their own original conception.

The Romans really commenced their building history 540 B.C. Art was really not properly understood by the Romans at the time of their conquest of Greece, and we find them quick to borrow or copy some of the beauties of Grecian architecture and combine them with their own. This is seen in the case of the Pantheon at Rome. The Romans were also in the habit (for some time after and perhaps before the conquest of Greece) of commissioning Greek architects to assist in designing their buildings, and drew upon Greece for the sculpture to adorn their villas and buildings. Thus the Pantheon shows an example of a mixture of styles, and could almost be taken for two separate buildings (one the main building and roof), a transformation of the old Italian burial mound (here it consists of a solid cylinder of masonry), and

set up in front of this is a Greek portico of light columns, in appearance like a Greek temple of the Corinthian order, with little harmony between the two styles. We see before us a grand dome with a porch, though not of the greatest beauty. It has the advantage of being the largest, as well as the first, piece of vaulting in the world. Its diameter is 140 feet, and was erected by Agrippa, 27 B.C.

(To be continued.)

MANCHESTER CATHEDRAL.

IN the *Manchester Guardian*, Mr. Reginald Blomfield offers the following criticism on the restoration of Manchester Cathedral:—

The work done in the last few years in Manchester Cathedral can hardly be considered an ordinary case of restoration. The horrors perpetrated in 1814-16, and again between 1845 and 1873, had reduced the fabric to such a wreck that in point of fact there appears to have been very little left to restore. Moreover, as it was necessary to transform the church into a building capable of accommodating a large congregation, it would clearly have been impossible, even if desirable, to reconstitute the church in the state in which it was left in the sixteenth century, for this would have involved the reconstruction of the chantries and their screens. The actual necessities of the case undoubtedly justified considerable interference with the fabric, and the rebuilding of work which had become ruinous. But admitting the necessity of restoration, or rather of reconstruction, the question which must have presented itself at the time, and still returns to the mind of the critical person, is whether or not the right method was adopted. There were two possible ways of dealing with the problem of restoration. Either the work which had to be rebuilt could follow the old work exactly, and to this course there is the objection given above, that new work cannot reproduce old work of this kind exactly, and that, even if it did, it would be simply to manufacture so much fictitious history; or the new work might make no attempt to follow the old, but be designed afresh. For reasons already given, the latter would, in my opinion, have been the right course; it would at least have prevented the building from being unreadable even to an architect, and would have been a substantial contribution to the history of the church. However, it was decided to follow the old work exactly, and Mr. Crowther, the architect, has evidently spared no pains to render his imitation as complete as possible. His attempt unfortunately was an attempt at the impossible, and of necessity his reproduction of the old details lacks the vitality which carries conviction. As to new work, perhaps the obligation which he imposed on himself to copy the old work almost with servility may have cramped his design, and may account for its wiriness in detail and deficiency in scale and proportion. For instance, on the north and south sides have been added two porches. In both these additions the stonework of the tracery is too small and overcrowded. The subordinate mullions are too thin (much thinner than any Mediæval builder would ever have dreamt of), and the cusping is purely mechanical. In the cinquefoil heads all the cusps are of the same size, whereas it is well known to students of Gothic that in the best examples the centre cusp is always larger than the other four—a point well brought out in the tracery of Mr. Bodley's beautiful church at Pendlebury. Again, the glazing is altogether out of scale with the stonework. Where ashlar is used the size of the stones establishes a certain scale which has to be followed all through. The panes to the glazing of all the new windows are not an eighth of the proper size in view of the scale of the stonework. The effect of these horrid little lozenges with rather wide came is neither more nor less than stuffy. The inscription over the south porch, with laudable modesty, is carved in letters so small as to be barely legible. Now, lettering was a decorative chance that no Mediæval designer ever threw away, and if he was going to have an inscription he would have no doubt employed the whole space now occupied by the quatre-foils, the brattishing, and the inscription with one great label of letters. The actual letters used should have been at least six times as big. The same absence of proportion appears in the west side of the north porch. Here the inscription string is placed in the wrong place. Either there should have been no string at all, or it should have been placed either higher or lower. Had this been done, a definite relation of high and low would have been established between the wall spaces above and below, which is the whole meaning of proportion. As it is, the building is long-waisted, owing to the position of this string. The north part of this porch is very much better, and is a good piece of modern Gothic. Here the proportions are justified by the wide plain opening below the string and the rich canopy-work above. But why was that niche on the east side put in when there might have been here a bit of plain wall surface, for which the soul of the weary pines in vain in Man-

chester Cathedral? One word more of criticism on the south front before we go inside. The two new windows inserted in place of the windows of 1815 are not happy. If these windows were to be replaced, why not have done an unmistakable piece of new design, the plainer the better, or else follow the segmental heads of the windows to right and left? Either adhere to the symmetrical design or frankly break it; as it is, these windows do neither.

Mr. Crowther, or his builder, appears to have overlooked the essential element of a four-centred arch—that it should be four-centred, and not struck from two centres with straight continuations. A comparison of the arches of the new four-centred windows with Stanley's genuine four-centred archway into the chapter-house will show how much is lost by neglect of this exceedingly simple practice of the Mediæval builders.

Inside the cathedral the restorer has hardened his heart. He has rebuilt the nave and aisle arcades doubtless in faithful copy of what may have been there before. Otherwise it would be hard to account for the altogether unworkmanlike way in which the mouldings of the piers come down anyhow on to the flat surface of the base. On the whole, the chief fault of the new detail of the interior is its inattention to scale. The crockets and carving above the two new entrances are unpleasantly crowded, and suggestive of branches of broccoli. The woodwork to the screens and doors is thin, and somewhat resembles the cast-iron tracery of the 1820 days—the days of darkness and despair. That it is possible to use very delicate tracery is proved by the old screens of the cathedral, and again by the new woodwork in Pendlebury Church. But it all depends on proportion. It does not do to have thin tracery straggling down thin mullions in sheer weakness and incapacity to stop; but if there is a definite relation between intricate and plain, open and solid, the delicacy of thin open-work is justified by contrast.

Mr. Crowther has been very much happier with his new roofs, which are well designed, and very materially add to the rich effect of the church as a whole. The nave roof is a little heavy perhaps, but on the whole will stand comparison with many a roof of the sixteenth century. On the south side of the choir a space has been walled off for the Fraser Chapel, and the south window of the next bay westward has been taken down and set back flush with the opening to the chapel. The reasons for this proceeding are very mysterious. The new wall on the west side of the chapel is ugly, and a fine opportunity for a wooden screen or a grille of iron or copper is lost by building it; while outside the sins of the architect have found him out, for though he skilfully added a buttress, he could not get over the fact that to the east of the south window of the chapel there is a broad space occupied by two tiers of cinquefoil panels, whereas on the west side all that could be allowed was a narrow return angle barely one quarter as wide, and the result is that as you stand opposite the chapel on the south side the composition is hopelessly lopsided.

In spite of these criticisms, however, the work done in the cathedral in 1882-92 is more thorough and conscientious than anything done since 1815. Not to dwell on the mutilations of the first half of this century, there is the new tower. The old tower, completed in 1518, was pulled down in 1863, apparently for no reason except that the north, south and south-west pinnacles of the tower were blown down in 1792 and the slate roof had been allowed to go to ruin, so that the flag-staff had decayed, and it was dangerous to ring the bells—dangers which might have been met, one would think, without pulling down this fine old tower. However, whether it was necessary or no to pull down the old tower, it certainly was not necessary to build in its place such a monument of sham Mediævalism as the new one. The old tower was 124 feet high, but he who designed the new tower thought he would "go one better," so he made his tower 139 feet high, but copied the old details, as if by dragging out the details like india-rubber the design might be made more imposing without losing its character. The consequence is that whereas the old tower was a compact and well-proportioned piece of architecture, the new tower is positively oppressive in its gaunt, unutterable lankiness. Then, again, Sir Gilbert Scott, the arch-destroyer of our national monuments, left his mark here also. Manchester Cathedral was once the happy possessor of an organ made by Father Smith in 1684, with a good oak case of about the same date, which was repaired in 1742; but Scott, with his villainous idea of "Gothicising" everything, swept this organ into space and spent some 5,000*l.* on a new organ and the trumpery case which now occupies the west end of the choir. Whether the organ is at all equal in tone to the old one it is impossible now to say, but it is clear to anyone that the new organ case clashes hopelessly with the fine old woodwork of the choir, and as seen from the nave its effect is fussy and insignificant. The last horror of all is a new alabaster pulpit. Now, alabaster ranks with marbles in the beauty of its veining and its colour, both of which can only be seen to advantage in flat plane surfaces, as may be seen on the south side of the stairs to this pulpit. But the pulpit itself is elaborately carved

from top to bottom, with the result that one cannot see the beauty of the marble because it is concealed by the carving, or make head or tail of the carving because it is concealed by the translucency of the marble. Moreover, the large cove above the capitals to the cymettes is not a stone or marble construction, but taken from the ordinary wood or plaster cove in front of wooden brackets.

Few churches have suffered more cruelly than Manchester Cathedral, and it is rather melancholy to think that not the least of the serious injuries it has suffered have been due to generous piety of excellent intention but inadequate taste. Though the interior of the church is effective in its way and not without some charm of colour and the mystery given by the vistas of its many aisles, the net impression left on the mind of a stranger is one of confusion, of a sense of bewilderment, due to the extreme tenuity and want of reticence in the details and the absence of one great masterful idea controlling the whole. The new church at Pendlebury (St. Augustine's) provides a good object-lesson in comparison. Nothing could be simpler than the idea of this design—one great aisle with shallow bays at the sides formed by the internal buttresses. Yet by austere reserve in ornament, by scholarly and refined proportions, and by a most delicate and fastidious taste in colour Mr. Bodley has succeeded in producing one of the most dignified and beautiful churches built in England since the time of the Reformation. There is, indeed, in the old cathedral one grand fragment of inestimable value. At the west end of the nave there remains the old tower arch and parts of the adjacent wall. The tracery of its panels is effaced, the contour of its mouldings is fading away in the slow decay of time, its entire surface is dented into a soft delicious texture. But it still stands strong, simple and masculine, scarred like some time-worn hero frowning contempt ineffable on the pettiness of later ages.

KIRKSTALL ABBEY.

THE members of the Sub-Corporate Property Committee of the Leeds Corporation having charge of the Abbey ruins and grounds at Kirkstall visited them on Monday. They were met by Mr. Micklethwaite, architect, under whose instructions the work of preserving the ruins has been steadily proceeding during the last few months. As has been previously stated, says the *Leeds Mercury*, the most dangerous part of the ruins is the tower, and it was to this particular portion that Mr. Micklethwaite directed the attention of the committee. Eventually the members passed a resolution recommending the Council to allow the erection of certain buttresses, and also the construction of an arch across the transept. These, it was said, would considerably add to the security of the tower. In the Abbey grounds the "unemployed" have been doing good work. They have almost completed the construction of a 36-foot carriage-road through the grounds. The soil dug out in this way has been formed into a bank, which runs along the edge of the water. Upon this trees will probably be planted.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh general meeting of the Institute of Architects was held on Monday evening, Mr. J. Macvicar Anderson, president, in the chair.

Mr. ARTHUR CAWSTON then read a paper on

The Advantages of adopting a General Scheme in making Improvements to the London Streets.

Mr. Cawston said:—When we as architects remark the convenience and the spaciousness of well-ordered continental towns we cannot resist a feeling of admiration for their grandeur, and a just feeling of pride in our foreign professional brethren whose ability and labour have produced such splendid results. But if our *confrères* abroad are entitled to praise for the splendid works they have achieved, can we here in London claim any such praise for what we have done towards the improvement of our capital?

When last year our Government tardily attempted to remedy the block in the law business of the country they referred the question to a council of judges, who, as heads of the legal profession, were evidently considered responsible for the defects which caused the block. If an epidemic of typhoid fever breaks out in London through a contaminated water-supply, or if any other infectious disease ruins the health of our towns, surely medical officers of health must be held responsible, as they should have warned the authorities of the danger, and used their influence to prevent it.

In the same way with regard to architecture we cannot get away from the fact that any impartial observer must consider that we, more than any other body of Londoners, are responsible for the inadequate and inartistic streets of our capital. Of course we who are in the secret know (to our cost) that the

real reason why London has lagged behind in the march of improvement is to be found in the fact that we have had no real municipal government, and naturally no municipal enthusiasm. Unfortunately, however, this is not universally appreciated, and so we architects continue to suffer reproach for the absence of convenience and dignity in our streets.

However, we have now a popularly-elected governing body, and, as everyone anticipated, we are getting men of distinction to interest themselves in our wealthy and historic capital. All excuses for procrastination, therefore, are gone, and London ought now to become what her inhabitants desire, and what her architects, we flatter ourselves, are able to make her. For the main responsibility for the architectural appearance of our town cannot rest entirely with a body of gentlemen the majority of whom are or are not elected every few years, and who are always occupied with a thousand and one other weighty problems of daily government. Such responsibility should, in my opinion, rest largely with the organised representative body of the profession, one of whose most important functions should surely be to advise on the architectural improvement of London, and another to sit in judgment on the work that is carried out.

Let us then, encouraged by the happy constitution of our new popularly-elected government, and undaunted by many attempts that have from time to time been made and proved ineffectual, make one further attempt to prepare for such a reformation in the architectural appearance of our capital as will at any rate bring it up to the level which has been reached elsewhere.

It will probably occur to every one of my hearers that the best examples of city improvements are to be found abroad. But I want you to clearly understand that if equally good examples were to be found at home, I should prefer to study them. I give place to no man in my admiration of the artistic works of my brother architects of modern times, and I am proud to belong to a profession which includes the names of Sir Gilbert Scott, Sir Charles Barry, George Edmund Street and many others who are still among us. These names, however, are associated with isolated works, and for that architectural work which comprehends the regeneration of cities it is essential to look for examples abroad. This Institute realises this necessity in practice by sending some of its most promising students over the seas year by year. By this means we have reported to us the progress that takes place in all that pertains to architecture throughout the civilised world; and from this and other sources we find that the capitals of Europe have been or are being rapidly transformed into well-ordered, convenient cities. In carrying out the work some general principles, fixed and immutable in their nature, must have been adhered to, and if similar principles can be ascertained and applied to London, we shall without doubt be able to convince our councillors that our capital can yet be made to rank amongst the most convenient and beautiful as well as amongst the most wealthy capitals of the world.

Of recent contributions to this Institute on foreign cities which particularly refer to the subject before us, I need hardly remind you of that from our members, Messrs. Farrow and Blashill, who in 1889 gave us an interesting account of those splendid extensions which have already taken place in Vienna; or that in the same year Mr. Francis Hooper, as holder of the Godwin Bursary, studied in Paris, and delivered before this Institute a most valuable account of building control and administration in France. In his paper were enumerated the series of laws under which our industrious and thrifty neighbours have nearly completed the rebuilding and transformation of their capital. A vast transformation indeed, which has perhaps never been more powerfully described than by Mr. Albert Shaw, that most competent critic of municipal institutions, who writes as follows:—

In the work of transforming the labyrinthine tangle of narrow, dark and foul Mediæval alleys into broad modern thoroughfares, and of providing those appointments and conveniences that distinguish the well-ordered city of our day from the old-time cities, which had grown up formless and organless, by centuries of accretion, in this brilliant nineteenth-century task of reconstructing cities in their physical characters, dealing with them as organic entities, and endeavouring to give such form to the visible body as will best accommodate the expanding life within, Paris has been the unrivalled leader. Berlin and Vienna have accomplished magnificent results in city-making, and great British towns—Glasgow, Birmingham, Manchester and others—have in a less ambitious way wrought no less useful reforms, but Paris was the pioneer. French public authorities, architects and engineers, were the first to conceive effectually the ideas of symmetry and spaciousness, of order and convenience, of wholesomeness and cleanliness in urban arrangements.

The grandeur and masterful thoroughness of the work prove that Paris, as it exists at present is the modern model city London is probably destined to copy, as the increasing density of population makes it necessary to pile up many more human beings on a square mile, without impeding a constantly increasing circulation.

I suppose we shall all agree that for this reason, and because of the great strides in sanitary knowledge during recent years, it is essential that our metropolis should as far as possible be improved and adapted to the requirements of to-day. The principal reasons for such improvements may be briefly indicated under the five following heads—the benefits to health, to traffic, to the labouring classes, to the metropolis generally and to the nation. It is obviously impossible that within the limits of a paper such as this the whole of these reasons for improvement can be adequately treated, but I have attempted this in a work which I shall shortly publish. This evening, and before reaching the main part of my paper, I can only ask you to consider the benefit to the health of the community that would arise from rational improvements.

We all know what has already been done in reducing London's death-rate, but that rate in some of those districts where the population is most dense, such as Bethnal Green, still remains at 40·0 per thousand. It is just in these districts that one of the greatest dangers to the health of London lies. They are the spots on which epidemic diseases fasten, and until they are transformed, progress in lessening the general death-rate will continue to be arrested. Not only so, but London, which was once in the van of sanitary progress, has lost her place, and until the remedy be found will fall further and further behind cities to which she formerly showed the way.

The following figures are taken from the annual summaries of deaths issued by the Registrar-General since 1874, from which date only the death-rates of foreign cities have been included in the summaries.

Death-rate in 12 leading European Cities in 1874 and 1890-91.

Cities.	1874.	1890-91.*	Decrease of Death-rate.
1. Berlin . . .	32·9 per 1,000	20·9 per 1,000	12·0 per 1,000
2. Liverpool . .	32·0 "	23·6 "	8·4 "
3. Birmingham . .	26·8 "	19·7 "	7·1 "
4. Hague . . .	26·5 "	19·5 "	7·0 "
5. Glasgow . . .	31·1 "	25·3 "	5·8 "
6. Turin . . .	26·7 "	22·8 "	3·9 "
7. Rome . . .	27·5 "	23·6 "	3·9 "
8. Brussels . . .	23·9 "	21·5 "	2·4 "
9. London . . .	22·5 "	20·3 "	2·2 "
10. Paris . . .	22·4 "	21·6 "	0·8 "
11. Vienna . . .	24·6 "	24·6 "	Nil
			Increase
12. Dublin . . .	26·0 "	26·5 "	0·5 per 1,000

These figures clearly show the improvement that has taken place in many large cities, and they also show that no material alteration has taken place in the health of London and Paris during the same period. The reason of this is, I think, to be found in the fact that radical changes were being made in those cities which show marked improvement, while in London and Paris little change took place during that period.

For instance, between 1875 and 1885, Birmingham transformed about eighty acres in the centre of the town from squalid slums into fine thoroughfares. Mr. Chamberlain, in his evidence before the Royal Commission on the Housing of the Working-Class, stated:—

The effect on the death-rate has been very remarkable indeed. The eight most insanitary streets in the area before the scheme averaged, for the three years before the proposals were in operation, 53·2 per thousand. Since then, in the last three years, the same streets have averaged 21·3 per thousand, and the scheme in part, with the other causes to which I have referred, throughout the borough of Birmingham, have led to a general reduction of the death-rate throughout the borough from 26 in the thousand for the three years 1873, 1874 and 1875, to 20 in the thousand for the three years 1880, 1881 and 1882.

In Glasgow, the City Chamberlain states that the great municipal work of breaking up the dense foetid closes in the old central districts of the city, together with improvement in sanitary administration, has resulted in the annual saving of the lives of 1,271 inhabitants. This great municipal work was also completed during the period referred to. Similar sanitary and street improvements were being vigorously carried out during this same period in Berlin, Liverpool and The Hague.

No doubt these great strides of improvement were taken in following the example of London and Paris. London had before this period, by the construction of her great sewerage works and other sanitary improvements reduced her death-rate materially, and Paris, by abolishing her slums and transforming herself into a city of wide and beautiful streets, had also reduced hers. But during the later period above referred to

both London and Paris more or less rested on their onward march, for no one can believe that the London death-rate of 20·3, or the Paris death-rate of 21·6, is the ultimate goal of sanitary reform. Many of us, indeed, believe in the possibility of reducing these figures to one-half. That this is no dream is shown by the death-rate of Hampstead, which is 14·7, and by the striking experience of the Artisan Dwellings Company, which is able to boast of a death-rate in its tenement blocks of 12·85.

In attempting to carry out extensive alterations in conservative London many great difficulties and expenses will have to be faced, most of which would not have existed if in the past there had been efficient municipal control. The want of a general plan showing future street alterations authoritatively settled has also undoubtedly been the reason why many streets lately formed are not for the general convenience, have not been financially successful, and have neither created enthusiasm amongst the public nor brought credit to the authorities. Let us examine in detail, and under the following heads, the reasons for having a comprehensive plan, and as complete a comprehensive plan as possible:—

- For discovering the causes of our present inconveniences.
- For producing the best improvements that can be produced.
- For forwarding them as rapidly as possible.
- For making them as economically as possible.
- For æsthetic reasons.

Importance of a General Plan for discovering the Causes of Present Inconveniences.

Immediately a general plan of London is examined by anyone anxious to solve the many problems of our present inconvenient streets, to discover where slums are mostly to be found and the reasons that have prevented improvement, he must be first struck by the fact that many slums exist in the very centre of our capital on sites which, in a well-arranged city, would be the most valuable. The cause of this is soon apparent, and, as usual, the impediment to progress is the English law. Look at the shape and extent of the "Devil's own" estates, which extend a distance of about three-quarters of a mile from Theobald's Road on the north to the Thames Embankment on the south, and which present a barrier against any attempt at opening up the most crowded districts of Central London, of admitting to them more light and air, or of allowing any better means of communication between the City and the West End. Wherever barriers to free circulation exist, whether in a river, in the human frame or in a city, there will be formed an aggregation of scum, of disease or of slums. Now such a want of free circulation exists in Central London, on both sides of the Inns of Court, and hence the unpardonable squalor peculiar to the slums in the central square mile of our capital. The first urgent need for improvement, therefore, as will be perceived by every earnest student of the map of London, is the opening up of these districts by broad thoroughfares which must of course pierce the sanctuaries of the law. Other impediments to free circulation will, unfortunately, be found. South of the Thames, railway viaducts and embankments divide the metropolis into sections and sever contiguous districts, when the trouble, danger and nuisance thus caused would have been entirely avoided by making the lines in cuttings or tunnels as on the north side of the river. Superb public parks and gardens are so enclosed and so difficult of access as to form most serious impediments to street improvement, and the full benefit of their presence is denied us, whilst their surrounding streets are filled to overflowing. A wide tidal river hems in, and is hemmed in by, stifling purlieus that have become crowded and neglected for want of opening up by wide streets and additional bridges. These are but a few of the difficulties that must be removed if London is to be made convenient and healthy. If it is also to be made beautiful, other difficulties have to be overcome. We find many public and other important buildings hidden away in tangled and crowded streets as to be almost unapproachable and entirely forgotten. So forgotten, indeed, that I must mention specimens, such as the Mint, the Record Office, Guildhall, Westminster Town Hall and many of our county courts and coroners' courts. Whilst many hills in our home counties offer sites which are in every way suitable, we find here in Central London asylums for lunatics, schools for the blind, homes for foundlings occupying acres of unsuitable sites in crowded districts, impeding surrounding progress and depriving their hardworking neighbours of healthy homes. Such unintelligible and widespread impediments as these, and many similar ones, will not easily be discovered if improvements are still to be considered in dribblets, such as a street half a mile here and three-quarters of a mile there, whereas they become apparent immediately a general plan of improvements is taken in hand.

Importance of a General Plan for producing the Best Improvements that can be produced.

Probably the best complete scheme of London improvements should embody (a) the complete utilisation of every district of

* During the years 1890-91 influenza was prevalent in parts of Europe, and affected the death-rate materially. For this reason, where the rate seriously differed in any city during these two years, the lower rate is quoted as being closer to the normal rate.

London's enormous area for its most valuable purpose ; (b) the creation of continuous arteries, sufficiently wide for the future as well as for to-day, and judiciously placed so as to connect the most important centres of business and habitation, and the railway termini.

This consideration has up to the present time been entirely lost sight of whenever improvements have been considered, consequently the rehousing of the displaced working population, a question inseparable from improvement schemes in London, has always been a most serious difficulty. As it seems most probable, for many reasons, that improvements will be carried out in the slums before elsewhere, this question still remains of the first importance. I know that it is necessary for the working classes to live within a reasonable distance of their work, but surely it is not consistent with the general welfare to give up the very central square mile of London to such purpose, especially as more comfortable and healthy dwellings can naturally be provided where land is so much cheaper as in parts of Southwark, Lambeth, Clerkenwell and Marylebone. If a map of London be studied acres upon acres of land, which could be made available for workmen's dwellings, and which is most likely always to remain the most valuable and suitable for this particular purpose, is at once discovered within a mile of the centre of the metropolis. Such sites are occupied by the Foundling Hospital, the military school at Chelsea, and many similar institutions, Bethlehem and St. Luke's Lunatic Asylums, many gasworks and water filtering beds. Would it not be well to remove these present occupants into the suburbs or the country, and clear the sites for labourers' dwellings? Some of us might regret the disturbance of old hospitals, but a larger majority of us regret more sincerely what is apparently the only alternative, namely, the removal of workmen to the suburbs, and the consequent loss of time and money in conveying them to and from their work. I have calculated that fifteen sites, which I propose should be gradually devoted to this purpose, contain an area of 144 acres. After deducting one-fifth of this area for additional broad roadways, and, assuming that the same density per acre will be as healthy on these sites as on the site of Peabody dwellings and playgrounds in Drury Lane, the extra number that can be accommodated within one mile of the centre of the metropolis is found to be 127,000 men, women and children.

Immediately a comprehensive plan is studied, the small number of our main streets and the shortness of our other streets is at once manifest. As Mr. Albert Shaw remarks :—"London, like all other old cities, is a vast, tangled network of streets that for the most part begin nowhere and end nowhere." Without doubt, the longer and the more uniform streets are made, the more valuable they become for many reasons. But length and uniformity can only be obtained by first planning streets to a small scale on a complete plan of the whole county. In many cases, too, quite insignificant clearances at various points are only required in order to render many of our side streets suitable for relieving the present overcrowded main streets to a very considerable extent. Every surveyor knows what has been the cause of these small obstructions, and how they are still being created by the absurdities and difficulties that exist in connection with laying out building estates in London, especially in the suburbs. For instance, no matter how irregular may be the shape of an estate which is to be developed, the owner is allowed, in order to follow the contour of his boundaries, and to cover with houses every corner of his property, to make his roads tortuous as snakes so long as they lead from one existing road to another. He is not, however, allowed to form any road which stops at his own fence, no matter how essential such road may be for the development of the adjoining properties. Thus more and more unhealthy and badly ventilated districts are being daily created, whereas if a settled plan were adopted, the development of each property would be a matter of general importance, and while adding to the convenience of the district the property itself would be benefited.

Importance of a General Plan for forwarding Improvements as speedily as possible.

If a comprehensive plan for improvement were authoritatively adopted in London, no single building in the whole county could be rebuilt without reference to the revised lines of frontage as laid down on that plan, or without becoming an integral part of the grand city that it would be the ultimate object of the plan to produce. That such a system would be of paramount importance for speedily effecting improvements will be shown by the following comparisons :—The annual average number of notices for new buildings and rebuildings issued to district surveyors during the last three years has been 21,932. As nearly all our streets admittedly want improving, as many central districts admittedly want entirely remodelling, and as all districts newly created in the suburbs are, at present, created without any reference whatever to the general convenience, we may fairly assume that one-fourth of these 21,932 annual notices refer to rebuildings which would each give an oppor-

tunity of advancing, under a comprehensive plan, the complete scheme for the improvement of London. On the other hand, the approximate total number of houses that will be removed by the Council Broadway improvement is 1,250, and what with legal and Parliamentary delays, this improvement may take about five years to complete, from the time it was first made public. This gives an annual average of 250 houses removed by this costly improvement, compared to 5,500 opportunities for improvement which would annually and automatically arise immediately a comprehensive plan were adopted. Again, it must be remembered that in the one case, every opportunity would come without legal expenses or delay connected with compensation for disturbances ; whereas, in the other case, legal expenses and delays and expensive compensations for disturbance occur in the case of each property taken. If, moreover, a comprehensive scheme be delayed, not only will 5,500 automatic and cheap opportunities for improving London be lost every year, but the very rebuilding on these sites will form the same number of impediments to be removed each ten times as costly as the opportunities that are lost. It is true that Ludgate Hill has taken about thirty years to widen, and I know that this improvement is used as an argument against the so-called "automatic" principle. The case of Ludgate Hill, however, is an abnormal one. The greater cost of the properties more recently acquired there have been due to the fact that Ludgate Hill has been allowed to remain, practically, the only main line of communication through that part of London. All the enormously-increased traffic is forced through that artery, with the result that its frontage sites have increased in value to an unnatural extent.

(To be continued.)

The PRESIDENT said the subject was one of great interest to Londoners. If they did not agree with all Mr. Cawston had said, they would agree that he had taken a very comprehensive view of a very comprehensive subject. They had the pleasure of having members of the London County Council present, and he asked them to express their opinions.

Mr. FREDERIC HARRISON, chairman of the Improvements Committee of the County Council, on being invited to speak, begged to be excused entering into a discussion. He only rose to thank them for their courtesy in inviting him and his colleagues to be present on the occasion, and having thanked them he considered he had done his duty. He had come to listen, to learn and be corrected, and not to make a speech. He hoped the members of the Institute would not suppose that the London improvements which had been attempted did not proceed on a settled plan. It was true there was no settled scheme that was open to the public, for the excellent reason that it would probably lead to wide-spread land speculation. As chairman of the Improvements Committee it might become his duty to speak on the subject before committees of both Houses of Parliament, and therefore he could not say anything prematurely. By an automatic scheme was it meant, he asked, a scheme that the Council could carry out without an Act of Parliament? Also it was proposed that the Council should gradually purchase property in order to carry out a comprehensive scheme. He did not know where the funds were to come from ; at present the Council had not a penny with which to purchase a single piece of slum property. Then if such a scheme were publicly adopted some persons might think it worth while to anticipate the County Council. The scheme could not be carried out for a long time, and it occurred to him how was the property to be valuable during the thirty years before the scheme could be carried out. He would suggest to Mr. Cawston before approaching the County Council that he should first turn over in his mind the financial part of the question. In listening to Mr. Cawston he made a rough calculation that the scheme would require an outlay of 150 millions sterling. He saw no way of raising that sum. If another great fire of London occurred he had no doubt the Institute would furnish another Wren. Of course there were some things which might facilitate carrying out parts of the scheme—for instance, if the Council had the power of making Acts of Parliament without going to Westminster for them, or if the Institute could persuade Parliament to let the Council have 150 millions of money.

Dr. LONGSTAFFE, chairman of the Building Committee, was then asked to speak. He said he did not think it was in order that he and other members of the County Council should monopolise the time of the meeting. He thought Mr. Cawston had somewhat underrated the difficulties of the matter, but it was good advice that they should look ahead. His committee had already given much time and thought in the direction of something like an automatic procedure. There was something wanting, too, in the Metropolitan Management Act, which, if amended, would meet certain difficulties. According to sanitary authorities, instead of a hard and fast rule for width of streets and height of houses, all that was necessary that the dimensions should be sufficient. The statement of the death-rate was something of a libel, as the figures given only applied to a

small area in Bethnal Green. His committee had got much good for Londoners out of the landlords. The landlords often wanted something, and offered advantages in return. Mr. Cawston's statistics in general must also be read with caution. It was comparatively easy in a very unhealthy town or city to reduce the death-rate very quickly and greatly by dealing with the unhealthy areas, &c. The insanitary conditions got rid, of course it was harder to reduce the rate. He believed that London was still the most healthy city in the world. In earlier days insanitary conditions prevailed, and cities were only populated by continually being replenished from the country. Now, indeed, children could be reared in London, and reared healthy and strong. The tendency of people to live in cities was all the more reason to make them as sanitary as possible to prevent deterioration of the race. One of the greatest difficulties they had to deal with was that London was made up mostly of small parts, such small pieces that had to be purchased and cut to waste.

Mr. RALPH NEVILL, F.S.A., said he did not think they should copy Paris. Crooked streets were often picturesque, and not always obstructive to traffic. They could scarcely take any line without pulling down some large buildings. There were plenty of areas covered with small buildings that could be pulled down and rebuilt without taking away what were really open spaces—the areas occupied by Bethlehem Hospital, &c. St. Luke's he would not object to if it were removed. He objected to a street crossing at right angles. Rather than that, the opposite street should start a few yards higher up or lower down the thoroughfare to be crossed.

Mr. JAMES NEALE, F.S.A., said that in no sense did Mr. Cawston speak for any member of the Arts Committee nor for any other member of the Institute. He thought it was absurd to show such a dream of a plan. They had to learn from county councillors and not the county councillors from architects.

Mr. ALFRED WATERHOUSE, R.A., said the speeches of Mr. Harrison and Dr. Longstaffe had rather cut the ground from under him. He thought that a thoroughly well-considered plan for the gradual improvement of London should be carefully matured. He was also surprised to hear that the County Council were working from a well-matured plan. In a multitude of councillors no doubt there was wisdom, but he would suggest that the plans, if not as mature as possible, should be made so, and that the plans should in some way or other be submitted to experts. He proposed a vote of thanks to Mr. Cawston for his paper.

Mr. H. H. BRIDGMAN seconded the vote of thanks. He mentioned the plan of the City Commissioners of Sewers for a street from the Tower Bridge to Aldgate, and thence possibly further in a north-westerly direction.

Mr. FRANCIS COOPER referred to Paris as a city where, in addition to the great improvements, many gradual changes had been going on for a number of years.

Mr. LEONARD STOKES explained his scheme for the improvement of Hyde Park Corner and Piccadilly, as shown by his drawing, exhibited along with another by Mr. H. P. B. Downing, showing pictorially a proposed Strand improvement.

The vote was passed by acclamation, and Mr. CAWSTON, in replying, said his book would deal more fully with the scheme he had outlined.

THE ISTHMUS OF CORINTH.

THE scheme for cutting a canal across the Isthmus of Corinth appears to be rapidly approaching completion. The concession was originally granted by the Greek Government in May 1881 to General Turr, with whom was associated M. de Lesseps. After the original capital had been absorbed and the operations for some time suspended, the operations were taken up by a new company, which, in 1890, entered into a contract with a firm which undertook to complete the works on March 10, 1893, under a penalty of 4,000*l.* per month for any delay after that date; but unfortunately about this time last year a water-spout passed over the works, flooding the excavations. This disaster necessitated a slight extension of the term, but the contractors now promise that a large steamer will go through the canal on April 23 next. Great efforts are being made to render the system of lighthouses adequate. The Corinth Canal, which will have cost from first to last two and three-quarter millions sterling, will be lit by electricity, with two powerful lights at each end, and a row of lights through its entire length.

PUBLIC LIBRARIES.

A MEETING of the Architectural Section of the Philosophical Society of Glasgow was held on Monday. Mr. Campbell Douglas presided. Mr. George Washington Browne, architect, A.R.S.A., Edinburgh, read a paper on "Public Library Planning." The lecturer said that, following the

development of School Board planning which resulted from the adoption of the Education Acts, which reduced planning to fixed rules, he sought to see if some such rules could not be laid down applicable to public libraries established under the Public Libraries Act. For that purpose he had prepared diagrams of half a dozen libraries which had been erected throughout the country from plans selected after public competition, and from these he had deduced a table which gave the following results:—That the number of square feet of floor-space per reader in the newsroom averaged 20, but in the reference-room the conditions were so varied that it was difficult to arrive at any result. In the lending libraries about 13 lineal feet of bookcases, accessible by hand from the floor, was required for every thousand volumes to be housed; the length of surface counter was about 23 inches for every thousand volumes. The area of floor-space should be 80 feet per thousand volumes. He further showed two plans by which, under exceptional circumstances, these floor-spaces might be reduced to 58 feet or 48 feet. But they were not to be taken as the figures looked for, but rather a theoretical standard towards which the designer's aims should be directed.

GENERAL.

The Exhibition of the Aberdeen Artists' Society is to be opened on the 14th inst., and it is expected that Lord Huntly will perform the ceremony.

Mr. F. H. Newberry, Glasgow School of Art, gave a lecture in the Glasgow Corporation Art Galleries on "The Art of Yesterday and To-day," in which he spoke of the meaningless nature of present-day architecture, and deplored the deterioration that art had undergone since the days of what he termed "the Classic period." In some far-off century they would find in the whole area now covered by Glasgow only one single structure giving evidence of an artistic taste—the cathedral.

Mr. Lawrence Banks, hon. secretary of the Royal Cambrian Academy, and an artist well known in Wales, died somewhat suddenly at noon on Saturday, the 28th ult., at his country residence near Bangor.

The "Church Reformer" for the current month contains an article on church restoration by Rev. T. Perkins.

Mr. A. Marshall, A.R.I.B.A., gave a lecture in the Nottingham Castle Museum to the members of the Arts Society on "Rome, Ancient and Modern."

Mr. H. Athron, architect, has been instructed to prepare the plans for a new Baptist church for Doncaster.

Sir Richard Bulkeley, Bart., has given to the Anglesey County Council a plot of land at Llangefni for a site for the erection of county buildings.

The Chancellor of the Exchequer states in a letter to the St. Saviour's (Southwark) Vestry that the Government has accepted Mr. Tate's offer, and that there was now a probability of the British Gallery of Art being established on a satisfactory basis.

The "Illustrated London News" says the will and codicil (both dated December 19, 1892) of Mr. John Gibson, late of 13 Great Queen Street, Westminster, architect, who died on December 23, were proved on January 14, the value of the personal estate amounting to over 53,000*l.* The testator bequeaths 500*l.* to the Architects' Benevolent Society.

Mr. J. W. Willis Bund, at the meeting of the Birmingham Architectural and Archaeological Society, read an historical paper entitled "The Domesday Book," which is to be incorporated in the proposed work on Worcestershire history.

The Society of Engineers will meet on Monday, the 6th inst., when the president for the past year, Mr. J. W. Wilson, jr., will present the premiums awarded for papers read during the year. The president for the year 1893, Mr. W. A. M. Valon, will deliver his inaugural address.

Mr. John Holden, F.R.I.B.A., will read a paper on "Materials and Construction" at the meeting of the Liverpool Architectural Society on Monday, the 6th inst.

M. Garipuy, the director of the Ecole des Beaux-Arts in Toulouse, has died there in his seventy-sixth year. Among the artists trained by him were M. Falguière, the sculptor, MM. J. P. Laurens, Debat-Ponsan, Henri Martin and other painters.

Mr. J. P. Jones, architect, Cardiff, has died in his forty-second year. He had secured one of the largest practices in the town.

The Surveyors' Institution meets on Monday, the 6th inst., when the adjourned discussion will be resumed on the papers by Mr. P. D. Tuckett and Mr. A. Goddard.

The Town Council of Bristol have decided to proceed with the promotion of a Bill in Parliament for the construction of new docks at Avonmouth and Bristol, at an estimated cost of nearly one and a half million.

The Architect.

THE WEEK.

THE project of a new city hall in Belfast has been revived. Three years ago an Act was passed authorising the erection of the building on what is known as the Linen Hall site, but owing to the operation of some novel clauses a final decision on the subject could not be given heretofore, nor until next November. Last week the improvement committee proposed that a competition for plans should be arranged, the prizes being 250*l.*, 150*l.*, and 100*l.* The sum proposed for the building was 120,000*l.* The site assigned occupies about one acre of an open space, which is to be laid out as a garden, and containing five acres. As rent from tramways, amounting to 4,000*l.* a year, will be available next year, and will be subsequently increased, it was concluded that the building could be erected without any increase of the taxation of Belfast. It was not intended to limit the competition to architects practising in Belfast or Irish architects. A few years ago we expressed an opinion about a similar project which, practically, was shelved. At last week's meeting of the Corporation the policy of delay was again adopted. It was suggested that as no definite decision could be given until November, there was little use in seeking plans until after that month. That view was finally taken by the members, and it may be assumed that the competition for a new town-hall is once more abandoned. The history of the project does not say much for the business qualities of the citizens of Belfast. Like the people in other parts of Ireland, we are afraid they are desirous to escape from the obligations that were undertaken by them.

THE Munich architects have succeeded in their agitation concerning the proposed Bavarian Museum. It will be remembered from what we have already stated that the Government were inspired by the modern notion of economists and officials, viz. that in a building, and especially a museum, it matters little about inside or exterior appearance so long as the plan is well arranged. Accordingly, it was decided to entrust the design to the official architects. It was also said that the grant was given on the consideration that the building was to be of an economical sort. The non-official architects remonstrated. During several months there was much discussion about the subject in Munich. A consultation has been at length held, in which representatives of all who are interested in the museum took part. The Cultus Minister presided, and the proceedings lasted for four hours. It was finally decided that sketch plans for the buildings should be obtained in competition, and that the programme will be prepared by Herr BERNASS, the oberbaurath, the director and conservator of National Museums, and three professors of architecture. Considering the power of officialism in Germany, it is a great victory for the private architects.

TRAVELLERS at home and abroad, as well as many other people, are often puzzled concerning the whereabouts of clubs. Mr. E. C. AUSTEN LEIGH has brought out a very handy "List of Clubs frequented by the English in all parts of the World." Now that the information has been given people must wonder why such a list was not published long ago. The little book will be a useful companion for travellers, and we may add it is likely to be considered as indispensable by all merchants and manufacturers who have business relations with colonial or foreign towns. It is published by Messrs. SPOTTISWOODE & Co.

THE Bradford School Board are endeavouring to persuade other boards to unite with them in obtaining a more general recognition of the value of central halls by the Education Department when calculating the accommodation of school buildings. In some cases the Department act as if the hall did not afford any accommodation except in the case of three mixed departments, in which each room is recognised as only accommodating one class of sixty scholars. It appears to the Bradford Board that the halls should be reckoned in the accommodation of the school, and that they

are as useful for two classes as for one. The matter is serious, as the cost is equal to about 10*l.* per child. Another grievance is pointed out by the Bradford Board: they have experienced difficulty and delay in getting plans passed by the Department, and they are of opinion that Circular 270 of the Department authorising the Department's architect to charge fees to school boards and other school managers for suggestions and conferences ought to be withdrawn. It is proposed to ask the Vice-President of the Council to receive a deputation on these subjects.

THE atelier of a Paris sculptor is hardly the sort of treasury that would appear attractive to a thief, but M. FALGUIÈRE can testify to the contrary. His premises in the Rue d'Assas were entered lately, and a piece of old tapestry, on which was represented *Hercules killing the Lion*, was carried off. The thieves made a parcel of a second piece, but through some unknown cause they were compelled to leave it behind. Tapestry is not the class of goods that can be readily sold to a receiver, and the police of Paris will not gain much credit if M. FALGUIÈRE's property remains undiscovered. But as they have failed to catch the ingenious rascals who stole the seven valuable paintings by Dutch masters, with other property, from the mansion of the Marquis DE PAMSSE-PASSIS, and who were admitted as agents of the Préfet, it is to be feared that the size of objects need no longer be an obstacle to the removal of property. The paintings comprised a soldier and the eternal white horse, by WOUVERMANS; *An Interior of a Church*, by PETER NEEFS; *A Landscape*, by RUYSDAEL; *Christ and the Samaritan Woman*, by VAN MIERIS; *The Golden Age*, by VAN WAËL; *A Dentist* and *A Topper*, by TENIERS. The Marquis regrets more the loss of family jewels than his pictures or other property.

THE City Council of Toronto, Ont., has recently passed a by-law respecting the erection of scaffolds. It prescribes that all scaffolding used by carpenters in the erection, repairing, altering or improving of buildings, chimneys or other structures, shall be built and constructed as follows: All uprights of said scaffolding to be 4 by 4, sound and free from objectionable knots, the brackets nailed to them and to the building, and to be 1 inch in thickness and not less than 10 inches wide, properly nailed to building and upright; and when there is no opening to nail said bracket, then a piece 1 inch thick and 6 inches wide to be notched to secure the bracket, and nailed solid to the wall and to the upright. The boards laid on this to walk on to be 2-inch plank, sound and free from knots, or else two 1-inch boards, laid one on top of the other. When bracket scaffold is put up the leg to be sound, and not less than 2 by 6 on edge, set at the proper angle to prevent the bracket from tipping from the wall. When scaffold projects from windows, the brackets to be 1 inch thick by not less than 10 inches wide and 6 inches deep, both brace and bracket well nailed to window, and the brace well nailed to bracket also.

THE correspondence which has passed between Mr. LENG, M.P., and Mr. MUNDELLA, president of the Board of Trade, will have been of service if it lead to a practical amendment of the patent law in this country. The correspondence is valuable not so much for the suggestions as to how the law may be altered, but because it should draw the attention of the public and the Legislature to the need of improving the conditions under which patents are taken out. Great Britain, the United States of America, Germany and other European countries have their respective systems, but none of them in all desirable respects meet the real needs of business, nor the interests of inventors. Probably no amendment of our system would be effected by adopting the regulations of the American or foreign systems. At the same time, it is certain that there is no lack of practical knowledge of business requirements in this country. It is only necessary that some among those who possess this knowledge should be commissioned to point out how our present system can be amended in the interest of invention and inventors without any violent or drastic changes. So far all systems have failed in many respects as tried in the balance. Great Britain, however, can easily if she chooses be the pioneer in the needed improvement.

THE BOULLES.*

THE series of "Artistes Célèbres," as our readers are aware, is not confined to painters and sculptors. It has already comprised biographies of BERNARD PALISSY, the potter; JEAN LAMOUR, the Nancy blacksmith; LIGIER RICHIER, who was probably the last of the provincial "ymagers," and now we have notices of some members of the family of the BOULLES, whose names are associated with decorated furniture of a peculiar class.

The case of ANDRÉ-CHARLES BOULLE exemplifies how easily immortality can be gained by the poverty of language. Dr. JOHNSON tells a story of a man in an inn who was surprised because he was unknown. He had a right to be aggrieved, for he could say, "I am the great TWALMLEY, who invented the floodgate iron." If he had not been fond of resemblances, and called his invention the "Twalmley iron," he was likely to be famous then and now. The French language had not a word or phrase to designate the sort of veneering and inlaying which ANDRÉ BOULLE introduced or employed. Other languages were as ill provided for the emergency, and in consequence the artist's name was used as a substitute. If the historian of Cornwall could say of one CHING, "The Patent Worm Lozenges have gained our Launceston apothecary a large fortune and secured to him perpetual fame," and if, as the poet predicts, "ISAAC's rigadoon shall live as long as RAPHAEL's paintings or as VIRGIL's song," may we not hope that the name of BOULLE will survive longer than those of some of his famous contemporaries? His name is not mentioned in the "Siècle de Louis XIV.," but how many great people are described in the pages of that history whose glory has been as unsubstantial as the sound of a trumpet?

What is more remarkable is that BOULLE's style is supposed to be inspired by principles that are wrong. Wealthy people give enormous sums for examples of his work. A pair of his armoires were sold at CHRISTIE'S in 1882 for 12,075*l.* and a small cabinet for 2,310*l.* But if a modern furniture-maker were to bring out pieces in the style he would not receive enough to pay the cost of labour. BOULLE's countrymen are chary of imitating him, and in the last French exhibition there was not one important example that denoted a desire to keep up the traditions of his inlaying. Fashion in furniture has run into a variety of forms, but for Boulle there seems to be no chance, although veneering, which is supposed to be a characteristic of our age, is better suited to it than to many other classes of work.

It does not always happen that neglect of an old way of employing materials is commendable; but if logic counts for anything in decoration, Boulle work deserved to be superseded. With it means of adornment are not subsidiary. The material that is used for a piece of furniture is treated as if it were only a foundation for inlaying, and was to be concealed. We may assume that wood was employed by BOULLE in every case, because that is the tradition; but there can be no certainty without such an examination as is rarely possible. He was willing to adopt forms for his *coffrets* and *gainés*, or pedestals, that were supposed to be employed only with metal castings, and when compelled to impart more or less resemblance to a wooden wardrobe when constructing his armoires he was careful to conceal his debt. BOULLE was not merely a decorator; he might be called a manufacturer of materials. The furniture-makers of that age were like him, for they twisted wood in defiance of all natural principles, and covered it with colours and gilding as if they wished to suggest that the material employed by them for the distorted forms was not derived from common trees. BOULLE went further, for he combined metals, ivory, shells and enamels in his pieces, while sculpture and engraving imparted additional interest to natural products. In that way he was able to produce furniture that for magnificence was without known precedent, and was therefore adapted to be deposited in the palaces of the Grand Monarque. With all its defects, BOULLE's work was less factitious than many other things in that reign that were dedicated *viro immortalis*.

From the indifference of contemporary writers about BOULLE, we might conclude that his work did not find much approval outside the Court circle. Even there we have no record of admiration for any of his productions. Why was it that Madame DE SÉVIGNÉ could gossip so delightfully about BIANCONELLI, the harlequin, and the stone he carried as a specimen of the house he was to build; about HÉBERT and VATEL, and yet remain silent about the new cabinets, bureaux, commodes, cassettes, &c., which might be supposed to captivate feminine imagination? The answer is that in those days there was among the arts a division corresponding with the *grandes entrées* and the *petites entrées* of the Court; the industrial artists were restricted to the humbler one. BOULLE was only an "ébéniste, faiseur de marqueterie, ciseleur et doreur," and to the courtiers was not more important than are the carvers and gilders to the visitors at a private view of the Royal Academy. The indifference is, however, not serviceable to biographers. When the time arrived in which BOULLE's life became a subject of interest, it was too late to discover all that people wished to know. As has happened with greater men, he can be only partially revealed to posterity.

The obscurity sometimes appears to be brought about by other forces besides accident. For instance, it is well known that ANDRÉ-CHARLES BOULLE was one of the privileged artists who were allowed to reside in the Louvre. He obtained that position on the advice of COLBERT, who said that, as an ébéniste, "le nommé BOULLE est le plus habile de Paris." That was in 1672, when the artist was in his thirtieth year. Now the earliest author who mentions the artist was an Italian, the Padre ORLANDI, author of the "Abecedario pittorico." Writing in 1719, he said that BOULLE was at once architect, painter, sculptor, mosaicist, ébéniste and designer. His inclinations were towards painting, but his father, who was an ébéniste, compelled him to follow that craft. It appears that from 1619 until 1636 there was a PIERRE BOULLE, who was the king's ébéniste, lodging in the galleries of the Louvre. He was a Calvinist, and was the father of several children. It would be readily assumed that ANDRÉ-CHARLES was one of his sons. But that is unwarranted. ANDRÉ was a Catholic, and his father's name was JEAN. We thus see that in the beginning of the sixteenth century there was more than one family of BOULLE who were cabinet-makers and residents of the Louvre.

The workshops in the galleries were an excellent school for students, and from the variety of artists who worked in them it is no wonder that BOULLE and others became remarkable for their versatility. But of the details of his education nothing is known. When his name appears in an official document he was accepted as the first of his craft in Paris.

Unfortunately the accounts of expenditure on works for the palaces, which are so precise in other ways, have not many entries about BOULLE. In 1669 400 livres were paid to an artist of the name on account of paintings, and in 1675 the large sum of 5,488 livres was paid to one BOULLE for transport of trees. Whether the ébéniste's versatility was equal to painting and gardening is not to be determined. The real BOULLE appears to have been employed between 1673 and 1675 on a dais in the queen's chamber. In 1681 he was paid 8,000 livres for an organ-case with ornaments of gilt bronze, and in 1679 he received 1,000 livres for a table which was enriched with marquetry of copper encrusted with tortoiseshell.

LOUIS the Dauphin, the only son of the Grand Monarque, was born in 1661, and in 1680 he married a Bavarian princess. His part of the palace of Versailles was not extensive, but it was made so attractive by mirrors, gilding, marquetry and furniture that princes and ambassadors were supposed to be favoured by seeing the rooms. BOULLE appears to have executed several novel works for the Dauphin and his wife, besides the parquetry of the rooms. He was paid 21,900 livres in 1682, and the following year the sum was 38,000 livres. French princes at that time were only tenants-at-will, and the parquetry was hardly completed when the Dauphin was evicted and sent to another part of the palace. He was, however, allowed to transfer the parquetry, and to adapt it to rooms of a different plan. The new position, from its dampness, was not favourable to the work. In 1687 BOULLE endeavoured to

* *Les Artistes Célèbres: Les Boulle.* Par Henry Havard. Paris: Allison et Cie.

repolish and repair the parquetry, but after the death of the Dauphin, in 1711, the rooms were not inhabited, and finally the parquetry was taken up and allowed to decay in the Garde-Meuble. It is to be regretted that so little is known about that class of BOULLE'S work which may be called architectural. In the curious portrait which is presumed to represent himself, and is executed in marquetry, we see introduced in the background a sort of throne with a screen, or it may be a very large cabinet, that seems to be broadly treated, and standing apart is a Chinese pagoda. Over the screen is a large framed mirror, and towards the foreground are balustrades. The figures suggest varieties of work beyond those which are credited to BOULLE.

The orders which BOULLE received from the Court and from others are not to be ascertained. Occasionally a document is discovered which shows that outside France his work was sought. He sent furniture to Savoy, Lorraine, Spain, Germany, &c. It is likely that, as long as his work was in fashion, he was liberally patronised.

BOULLE was, however, less able as a man of business than as an artist. In 1697 he brought an action against CROZAT, one of the richest financiers of the time, who declined to take pedestals and armoires which were not of the prescribed dimensions. BOULLE failed. In 1720 a still greater disaster befell him. During his life he was an enthusiastic collector of paintings, drawings and engravings. As he possessed influence at Court he was enabled to obtain space to accommodate his treasures in the Louvre. In a neighbouring workshop some timber was set on fire, and the flames soon reached the rooms assigned to BOULLE. Some specimens of his furniture, which he had prepared for LOUIS OF BOURBON, who was the first Minister of LOUIS XV. were saved, the works of art which BOULLE had accumulated perished.

A remarkable memorial was prepared by BOULLE, in which he gives details of his losses, with the hope that the Government would give him some compensation. It appears that he employed twenty workers in wood and six workers in bronze. The tools destroyed he valued at 4,200 livres. He was most careful to keep a stock of seasoned wood, and he valued it at 12,000 livres. Then there were several cases of veneers, coloured woods, panels of marquetry representing birds, leaves, flowers, ornament, &c. There were numerous models in wax by famous sculptors, and some in clay by himself and his sons. In some workshops were pieces of furniture in various stages of preparation. If the pictures, designs, &c., were included, the loss to BOULLE amounted to 370,770 livres, or, say 15,000*l*.

The inventory affords us a glimpse into his manner of production. He employed seasoned wood not only for the construction of the pieces, but for the veneers. At first he used to cut his veneers singly, but with experience he found he could, by placing two or three together, cut them with one operation. He was also able to make his inlays correspond exactly with the hollow parts, like the two parts of a die. He sometimes employed woods of various colours, silver as well as brass, tortoiseshell and ivory, copper and mother-o'-pearl. It is not believed that he designed all his works, and JEAN BÉRAIN, the engraver, who was in request as a designer of decorations and ornament, may have often aided him. In other ways he was able to utilise the ability of CUCCI, VAN OPSTAL, BALLIN, WARIN and DUVAL. But the credit for the modelling of masks and other works in metal, and for that co-operation which secured so much unity of character amidst the abundance of detail, is given to BOULLE. His pieces may be too fine for everyday use, and therefore are wanting in one of the essentials of furniture, and with such a combination of diverse materials, with their varying susceptibilities to temperature and time, it was not to be expected that they would wear well; but as a class apart in furniture they will always merit attention. From their defects as well as their merits the designer can derive instruction.

BOULLE'S latter days were not prosperous. It was customary with him to obtain advances on his commissions, and it is to be feared the money was too often expended on pictures and drawings rather than on materials or labour. The objects which ministered to luxury, and which are so perfect throughout, were produced under harassing circumstances. The Louvre was not a refuge against the invasion

of creditors and bailiffs who were clamorous for payment. Complaints were made to MANSART about the desecration of the palace, and the architect duly reported the affair to the king. The great LOUIS was not always out of the ébéniste's books, but he was not disposed to approve of the ill-management by which the royal name received a slur. Yet, in spite of all that French law could do, BOULLE continued to live for about ninety years. One of his sons appears to have been imprisoned for the paternal debts, but the old man died peaceably in the Louvre one morning in March 1732, surrounded by four sons, who, like himself, were among the royal workers in wood. He was buried in a little cemetery which then nearly adjoined the palace, for it belonged to the church of St. Germain l'Auxerrois.

The four sons of BOULLE do not appear to have reached even the financial success of their father, and all gave trouble to creditors. Their work would hardly fail in style to resemble that of the great improver of marquetry, but it is no longer possible to ascertain whether one of the younger BOULLES possessed any individuality. It was their interest to allow their pieces to be accepted by connoisseurs as the genuine work of their father. It is, however, too evident that in most of the large collections of BOULLE'S works there are some examples which are deficient in the qualities which we associate with his name. Lady WALLACE may be congratulated on possessing one of the few collections in which all the objects may be accepted as produced by BOULLE, or under his supervision.

It is no easy task to make a biography of an artist whose life was uneventful, and who left no records because he could not have contemplated that posterity would care about his doings. M. HENRY HAVARD has, however, utilised the scanty materials with skill, and his book is not only interesting but useful to all who are concerned with the history of furniture.

LONDON IMPROVEMENTS.

(Concluded from page 91.)

NOT only do the foregoing arguments prove the greater speed at which improvements can be made under a comprehensive scheme, but they also prove how a great saving in cost can be effected. There are many other economic reasons for a comprehensive scheme. For instance, when any isolated improvement is put in hand, it is necessary to calculate the approximate cost of the whole work, to borrow money to pay for it, to agree to complete it in a given time, and to refund, within a certain number of years, all that has been borrowed. In this way the cost of improvements is greatly augmented, for it not only includes the cost of the actual work, but a large annual amount for sinking fund, interest and the accompanying expenses. If a comprehensive scheme is ever adopted, this running into debt will be totally unnecessary, for the Council would then be enabled to put just so much of the scheme in hand as the funds available for that purpose from the year's income would permit. Again, one of the great impediments to street improvements, up to the present time, has been the terrible cost of acquiring properties, and it has been found again and again that whenever an improvement has been decided upon, speculators have bought up the property, have had drawings prepared for new buildings, have improved existing buildings and put all possible legal impediments in the way for the sake of making the authorities pay largely augmented compensations. The economic importance of adopting a comprehensive scheme is here again apparent, for it would be impossible for any individual or even any syndicate to purchase all the land which will be affected by the whole scheme, consequently the Council would have so much choice that they could purchase small portions here and there whenever the owners wanted to sell or were willing to sell at a reasonable price. Mr. Chamberlain's experience on this point during the municipal improvements in Birmingham, as stated by him in his evidence before the Royal Commission on the Housing of the Working Classes, conclusively corroborates the correctness of this view. It is also absolutely essential that a settled scheme should be adopted for another reason. As each new street is laid out, quadrants and places should be constructed with junctions left exactly where future new streets will eventually join them. A striking illustration of the want of this may be found in the case of the English Opera House recently erected in Cambridge Circus and Shaftesbury Avenue. This building has been placed exactly where a new street, which may become as important as Oxford Street or the Strand, should cross that circus. As already stated, large and most valuable sites are still occupied with slums of the poorest

description. Under a settled scheme the whole of these sites would gradually be put to their proper uses, and the recoupment that would then arise from the sale of surplus lands would go far towards the economic success of the improvement. A striking example of increased value has occurred at Chelsea, on the estate belonging to Earl Cadogan, who was advised on high authority to let a piece of ground at a ground-rent of 85% per annum. Because the whole neighbourhood has been developed in a statesmanlike manner, land has increased so much in value that the ground-rent of this same piece of ground has been, within five years, improved by the leaseholder to 900% a year. Not only so, but certain adjoining land, which is held in trust for the public, has increased in value by the action of the noble neighbour to at least 300 per cent. If a comprehensive plan of improvements were adopted all the undeveloped land in the county would, as it became ripe for development, also be automatically, and thus economically, opened up in accordance with the scheme. Both the community and the landowner would benefit by this, the former by having its streets made in the most convenient position from a public point of view, and the latter by being guaranteed a greater number of important thoroughfares across his property.

The reasons I have already put forward are of a practical nature. I now give some æsthetic reasons, first, for providing sufficient improvements without interfering with our ancient architectural monuments. "The works of those," said Sir Joshua Reynolds, "who have stood the test of ages have a claim to that respect and veneration to which no modern can pretend." This spirit of veneration, together with the knowledge that whatever improvements now made will be carried out in a time when ancient architectural monuments will be as jealously guarded as ancient sculptures and paintings, is a consoling thought when we think of the delays that have occurred in our street improvements. Is it possible that any scheme can produce sufficient improvements to an ever-increasing metropolis like London, without of necessity doing away with well-known landmarks, which, be they ever so faulty, have naturally become endeared by familiarity? Undoubtedly, and at once, I say Yes. For I know with what intense relief this will be received by antiquaries of a conservative nation, whose delight for comprehensive improvements has never been roused. What Londoner is there who would not regret any interference with St. Mary-le-Strand, with those awe-inspiring columns which denote the entrance to Exeter Hall, with the narrowness of Bond Street, or with those solid English walls which encircle the precincts of Marlborough House, Devonshire House, and the modern æsthetic Lowther Lodge. Such sights are to us as precious as a Lord Mayor's Show; and do not let it be thought that I consider this anything but a compliment to the "sticks and stones," for I thoroughly endorse every word of the somewhat cynical article on that interesting and popular ceremony which appeared in the *Times* of November 10 last. By studying a comprehensive scheme, it is soon discovered that sufficient lengthy arteries connecting the most important centres of business and habitation can be provided in such a way as would not only obviate the interference with our present main streets, or with such heirlooms and landmarks as I have mentioned, but would make these monuments more conspicuous by isolating them. For this reason alone such a scheme should commend itself to some of us.

Secondly, for raising municipal enthusiasm. What has been up to now the despair of all reformers of London municipal life? Has it not been the huge size of the city, and the supposed impossibility of uniting for one common object the inhabitants of its distant parts? Can anything be more calculated to raise the pride and enthusiasm of all Londoners, and weld them together for one common object, than a really great scheme of improvement? As each rebuilding in each district progressed, every Londoner would actually see a further development of that grand city all would have agreed to produce. Can one imagine the enthusiasm and pride that would be roused, some few years ahead, as the last block of houses in each new thoroughfare gradually came down, and for the first time an uninterrupted view of the new street, with its palatial architecture, was obtained. This has proved to be the case both in Paris and in Birmingham. Mr. Chamberlain, in his evidence before the Commission on the Housing of the Working Classes, said, when speaking of the transformation of Birmingham:—

The original object was to carry a wide street through the insanitary district, and thereby to ventilate the whole district, because nothing appears to be more absolutely true than that wide streets contribute to the health of great cities; they are, in fact, the lungs of the place. In order to get anything like a through ventilation it was necessary that this street should be continued into the centre of the town, otherwise it would have come out and been blocked, as it were, by rows of lofty buildings. But in addition to that the combination also had the effect of cheapening what I may call the insanitary part of the scheme, because by bringing this poor district into communication with the centre of the town, additional value was given to all the property after the improvement was made. Then there is a third

reason, which is not unimportant, and that is that by the combination of these two things the scheme was greatly popularised with the ratepayers. The great cost of these schemes is, of course, the great difficulty that local authorities have to face, but by the combination of the two things—that is to say, by providing what is a necessity for very growing towns, and a great town improvement at the same time—we were able to carry our proposals, I may say, practically with unanimity in the town. There was no opposition whatever made to the proposals which were laid before the town or to the cost which it was understood would be entailed upon the rates.

I will not risk tiring you with the many and weighty reasons which induced me to adopt six general principles, upon which I have already considered a draft comprehensive plan of London improvements, but I will acquaint you with those principles:—
1. To open up portions of our town parks, and some other open spaces. 2. To open out the most crowded districts, and admit more light and air. 3. To create many more great arteries connecting the most important centres of business and habitation. 4. To provide additional bridges over the Thames. 5. To facilitate the approaches to the several railway termini. 6. To open out as much as possible our public and ancient buildings, and to provide sites for new. Such principles as these seem to me to be fixed and immutable. In order to show how they can be applied in the case of London, I exhibit here an Ordnance sheet, on which I have traced those new streets which to me seem to be ultimately essential for the development of the central portion of the capital.

I venture to think that the true lesson to be drawn from this plan is that it shows how much a settled scheme would have accomplished almost automatically towards improving central London in the past few years, and how supremely important it is that the adoption of such a scheme should not be unduly delayed. The plan serves also to show what an unimportant part the proposed Council Broadway must play in any really effectual general plan of improvements. Apart from a general scheme this roadway has been boldly conceived; but alas, it only proves that the best isolated street improvements must be doomed to failure unless they form an integrant part of the whole street system. Let us apply to the proposed street the six essential principles for the general rearrangement of the London streets which I have ventured to lay down, in order to show how far this street will possess the vital requirements of an important thoroughfare.

1. So far from opening out the only open space in its immediate neighbourhood—the comparatively large area known as Lincoln's Inn Fields—the high buildings that are sure to be erected on both sides of the new street will form a yet more formidable barrier to the free circulation of air from that space. This open space should, if opened out by a great thoroughfare, become one of the most attractive spots in central London, even rivalling in its usefulness and beauty so famous a centre as the Place de la Concorde.

2. As regards opening up the poorest, unhealthiest and most crowded districts in London, the proposed position of the street is excellent.

3. As to the width of the street. A hundred feet as proposed will probably be sufficient both for present and future needs, especially as, from its position, it can never become a really important thoroughfare or an integrant part of any complete system. As to the length of the street. If the street be formed as shown, with the impossibility of its being continued further towards the south, I venture to prophesy that the southern portion will not be financially successful, but will remain another wide and empty street, like Gray's Inn Road, Conduit Street, Garrick Street, Vauxhall Bridge Road and Portland Place, for what proportion of travellers from the north want to be landed at King's College with no means of going further south, and only the narrow Fleet Street or Strand to conduct them either to the east or to the west?

4. No future bridge could assist the street where proposed, for it would be against all ideas, both of architectural beauty or economy, to erect a second bridge and its accompanying approaches so close to Waterloo Bridge. In the first place, because this would completely hem in the river front of Somerset House; and secondly, because Waterloo Bridge itself and its approaches can be economically doubled in width.

5. For the same reason the position is not the best for facilitating approach to the northern railway termini, for which purpose the street has been to a great extent advocated.

6. As to the advantage of the proposed site for opening out our public buildings, I venture to think it could not be worse. Our law courts, our bankruptcy buildings and King's College Hospital are all three much-frequented public buildings, at present placed in most crowded and inconvenient positions. One cannot conceive a more splendid opportunity than is here possible of opening out these three important buildings. Properly planned, a new street of less than a quarter of a mile in length would make all three buildings easy of approach from the whole of the north and north-west of London, and would bring out their architecture in bold relief. Instead of this the plan proposed merely brings out the flank view of a church,

intended by its architect only to be viewed as at present on its charming western front, while the main street will not open out any important public building at all.

The subject I have attempted to put before you to-night is so great and so important to us all that I fear it would be impossible for anyone to handle it with the fulness, force and clearness it deserves in the short time at our disposal. My own presentment of it appears poor and weak compared with what I should like to make it, and with what it ought to be made. I know of no subject that should appeal to us architects more forcibly than the architectural well-being of the city in which we live, and probably in common with you all I feel that the present condition of London is the subject of just reproach to our profession. It is not unreasonable that public opinion should expect of us some active steps, and I venture to urge upon you that it is our duty not to sit idly by and lament over the condition of our capital, but to take some vigorous and determined steps for its regeneration.

The measures which I propose to you to-night are simple. I ask you merely to give the official endorsement of this Institute to the opinion, held I think I may say by all who have studied the subject, that the only satisfactory way of making the streets of London adequate to our necessities and of improving its health and beauty, is by formulating a settled scheme of improvement and by gradually and steadily carrying that scheme into execution. I have endeavoured to show that most of the attempts at street improvements made during the past have been but spasmodic and feeble, compared with what might have been done and with what may still be done if such a plan be adopted. Fortunately, however, this has not been wholly so. Those cases where the improvement has been most successful are striking examples of the success of the method I advocate. We all know, almost every Londoner knows, that the gradual rebuilding of a part of London has been effected by the Duke of Westminster with unquestioned success; but it is not so generally known that these improvements have been carried out on a settled plan, and almost automatically, very much in the manner described in this paper. Lord Cadogan has also improved his London property in the same way, and thus have these great landlords shown us an example worthy to be followed.

The immediate practical step I think this Institute should take is to represent to the London County Council, our municipal authority, the imperative necessity of preparing a plan and formulating such a scheme as will be worthy of the greatest city in the world. If the Institute put these views adequately and forcibly forward I think the Council will not be found wanting. In the brief space that has passed since it has been created the Council has given many indications of a statesman-like interest in our welfare, and its work is beginning to kindle in our midst a faint spark of that municipal spirit which, in my belief, is absolutely essential to the carrying out of great municipal works. It may be truly said of the Council, "By their works ye shall know them," and perhaps it could do nothing so calculated to create a municipal spirit and to earn for itself an enduring fame as to boldly attempt the regeneration of London. The Council's predecessors failed in gaining our affection and esteem mainly from their lack of enterprise in this very direction, for their conceptions had neither grandeur nor comprehensiveness. Above all things, therefore, let not the magnitude of the work nor the fear of the cost deter us, for improvements never need be carried out at such a speed as to be an undue burden—indeed, I am fully persuaded the work need not prove a burden at all, but a blessing to the whole metropolis.

THE LONDON COUNTY COUNCIL AND TECHNICAL EDUCATION.

WE gave last week an abstract of the report by Mr. Llewellyn Smith, the secretary of the special committee appointed to consider what action the London County Council should take under the Technical Instruction Acts, 1889-91, and the Local Taxation (Customs and Excise) Act, 1890. In their observations on the report, the committee observe that while it shows that excellent work is being done in different parts of London, it also reveals how seriously the existing provision for technical education falls below the standard of Birmingham or Manchester. London contains a larger artisan population than any city, but its skilled traders are being largely recruited from the provinces, while Londoners, from lack of proper training swell the ranks of the unskilled labourers or of the unemployed.

Perhaps the most serious deficiency is the inadequate provision for evening instruction. About 100,000 children leave the London elementary schools every year, nearly all of whom ought to be found in the various evening institutions for the three or four next years of their lives. London ought, therefore, to have (besides adults) 300,000 or 400,000 boys and girls in its evening classes. Yet the total number of persons of all

ages attending evening classes in London in any branch of science, art or technology appears to be under 20,000, of whom 1,400 are in the evening classes under the School Board. Still more striking are the statistics for particular trades. In 1891 there were about 25,000 bricklayers within the county, of whom nearly 3,000 were under 20. The number receiving instruction in brickcutting was about 50; in the principles of brick-laying only about 40. The total number of operatives in all the building trades was about 140,000, of whom 15,000 were under 20; yet the number who were attending classes on the subject of building construction and drawing was less than 800. About 30,000 men and boys are at work in London in the printing and lithographic industries; only 140 of these were in 1891 getting any kind of technical instruction connected with their work. London has about 46,000 workers in the cabinet-making and upholstery trades, of whom 7,000 are under 20. The total number who were last year receiving technical instruction in their craft was under 120. Only three out of the 10,000 persons employed in London tanneries and only ten of its colour-workers were learning any branch of chemistry.

In view of the facts disclosed by Mr. Smith's report the committee recommend that the London County Council should resolve:—That, in view of the importance of London not falling behind other cities in the provision of technical education, it is desirable that the Council should exercise its powers under the Technical Instruction Acts, 1889 and 1891, other than that of raising a rate, by devoting to technical education some portion of the funds from time to time receivable under the Local Taxation (Customs and Excise) Act, 1890.

If the Council adopts the foregoing resolution some arrangement must be made for carrying out the very extensive work of considering the needs of every district, the claims of the various educational institutions and the manner in which their action can best be co-ordinated and supplemented. The committee recommend the appointment of a composite committee for this purpose, which might be called the Technical Education Board, whose chief function will be the evolution of some kind of systematic organisation. The possibility should be kept in view of the Board's being hereafter entrusted with funds from other sources, both public and private.

There remains the question of the amount of money to be devoted by the Council to technical education. If this were to be decided solely by the amount required for a really adequate provision for all branches of technical education, the sum would far exceed the limit of the Council's powers. Even to bring London up to the level of Manchester or Birmingham will require the expenditure of many hundreds of thousands of pounds. But it is obvious that the bulk of this expenditure must come from other sources than the county fund. What is now necessary is that such a sum should be appropriated as will provide for the most pressing needs and enable a beginning to be made in the work, to be ultimately completed with other aid. After careful consideration of Mr. Smith's report, the committee have come to the conclusion that, in order to deal fairly with all districts and provide for the more necessary subjects, a sum of about 60,000*l.*, in addition to the 30,000*l.* already set aside, should be appropriated to technical education for the ensuing year. This would involve the devotion to this purpose of about one-third of the funds receivable by the Council under the Local Taxation (Customs and Excise) Act, 1890.

CHURCH HALLS, EDINBURGH.

IT has now been decided to proceed with the erection of new church halls in connection with St. Cuthbert's Church on the site of the old manse buildings, and adjoining the site of the old halls in King's Stables Road, recently demolished in connection with the North British Railway extensions. The Kirk Session, on the recommendation of Mr. John Honeyman, A.R.S.A., architect, Glasgow, their assessor, have approved of the design submitted in competition by Messrs. McArthy & Watson, architects, 33 Castle Street, and the erection of the buildings is to be proceeded with at once. The site is an irregularly shaped triangle, and being below the level of the road the design required a special treatment. The building is placed lengthwise to King's Stables Road, and consists of two floors. The upper floor, which is approached from the level of the roadway by a broad terrace and a short flight of steps at the entrance door, is entirely occupied with the hall, which is seated to accommodate 800 adults. There are also suitable retiring-rooms. The lower floor is occupied with a smaller hall, class and retiring-rooms and caretaker's house. The heating and ventilating, and all the requirements for the public safety, have been very carefully considered. The exterior of the buildings is treated in the simple and dignified style of the Classic work of the last century as practised in this country. The cost of the buildings is 4,000*l.*

TESSERÆ.

"Breadth" in Art.

ONE of the most important requisites of chiaroscuro is a quality technically termed breadth. If there be a number of spots, either of light or dark, in a picture, or if a statue or a building appear to be cut up into a number of small parts, they are said to be deficient in breadth. There is nothing that conduces so much to the instantaneous impression on the mind, which is the great desideratum in art, as this quality. Nor does it only produce the first and striking effect in the work; but it also produces what, in technical language, is termed repose—that is, it allows the attention to be directed, quietly and at leisure, to the higher qualifications and less prominent beauties, and thereby enables the mind fully to appreciate the art exerted and the real power displayed by the artist in the expression of his subject. Breadth depends upon a just graduation of the lights and shadows in a picture. All lights should have some point more brilliant than the rest, and all shadows should have some heart, or deepest point, from whence they should graduate into the middle tint or general tone of the work. Pictures may be generally light, with a few dark objects relieved, as in Cuyp; in such cases they should not be of uniform darkness, but less dark at the outline than at some inner part. So, on the other hand, pictures may be generally dark with a few light objects in them, as in Rembrandt; here the light must be graduated in each object from some inner part to the outline. And, further, it is requisite, in pictures of these kinds, that the objects—whether, as in the first instance, dark against light, or, as in the second, light against dark—should be grouped together, if nearly equal in tone, and the intervening spaces between these objects in some degree assimilated by light or dark, so that the group of light or dark objects shall form a mass of light or shadow, in which there should be a nucleus of brilliancy or a heart of depth. Or one of the objects must decidedly predominate in light or dark, and the others must differ in quantity, as well as in degree, of light or darkness. Otherwise a spottiness will result, and the picture will be deficient in breadth and will want repose. Breadth in sculpture and in architecture is equally requisite, and is produced in the same manner: the details of a statue, group or building must be kept subordinate to the effect of the whole. In sculpture the markings of the muscles must not be so defined as to interfere with the unity of the trunk or limbs. In a group the vacuities between the figures should not be so apparent as to disunite what ought to be a connected whole. And in a building the openings, whether windows or doors, porticos or the projection of cornices which produce the general effect, should have such a variety and gradation as not to divide it into small or equal parts. But a very important point to be attended to is, that flatness should not be confounded with breadth: and, further, as pithily and forcibly observed by Fuseli, "that it were easy to have breadth if emptiness would give it." The parts should be there, and the general relief preserved; but in subordination to the effect of the whole work, whether of painting or sculpture.

The Burning of Rome under Nero.

Never did a city receive a greater permanent benefit from a transient calamity than Rome from the great conflagration in the reign of Nero. The extent, indeed, to which this destruction reached is not accurately recorded, though Tacitus assures us that three of the fourteen regions were utterly consumed and seven others more or less severely injured. The districts which he himself directly specifies refer chiefly to the hollow between the Cælian and Palatine, the valley of the Circus and the foot of the Esquiline. We may imagine that the flames, which ran from bench to bench the whole length of the Circus, would reach to the dense masses of building in the gorge of the Velabrum, and climb the adjacent hills, but we can hardly suppose that the temples and imperial mansion on the Palatine would be entirely consumed without special mention, still less that the ancient monuments of the Forum would be swept into the devouring abyss unrecorded. The Temple of Jupiter, on the Capitoline, seems undoubtedly to have escaped unscathed. Whatever limits, however, we may be disposed to place on the possible amplifications of our historian's rhetoric, there can be no doubt that a large portion of the city and some of the most thickly-crowded quarters were swept away, and reduced to a *tabula rasa* for the architectural fancies of the Emperor to disport upon. Nero seized the opportunity with his usual ardour. He had already revolved many schemes for effecting some great material construction which should render his name famous for ever. Now the time was come, and circumstances presented him with an object which, if worthily handled, could not fail to immortalise him. Nero had more of the Greek than the Roman in his character; more of the Oriental, the Macedonian Greek, than the purer and simpler Attic. He

resolved in his new constructions to emulate the great city-builders of Asia Minor and Syria; he rebuilt Rome after the fashion of Cæsarea or Antioch. Instead of the crooked, narrow streets of the old city, the result of the utter want of plan or systematic direction, which has been described, he laid out his new city in a regular network of straight and broad avenues, as far as the character of the site would admit of it; he widened the interior spaces of the blocks of houses, reduced their height and surrounded them with colonnades. He insisted that no houses should henceforth be built of wood only, but that all should have at least a basement of Alban or Sabine stone. Henceforth new Rome and old Rome were distinguished and contrasted with one another, and old-fashioned people continued fifty years later to sigh over their recollections of the ancient city, with its narrow streets and lofty houses, which intercepted the rays of the sun and retained the cool night air long into the morning. They might, at least, have been grateful for Nero's shady colonnades. We may imagine how large a portion of the population must have been displaced from the interior of Rome by this method of reconstruction. But Nero did much more than this. He had already connected the abode of his ancestors on the Palatine with the villa of Mæcenas, inherited by the Cæsars, on the Esquiline. A long bridge, arched and roofed in imitation perhaps of Caligula's viaduct to the Capitol, must have crossed the valley of the Colosseum to bring these two buildings into connection, and still leave open the necessary thoroughfares of the city. But he now determined to bring the two into closer union by the construction of vast buildings throughout the space between, so as to make one continuous series of halls and chambers, interrupted at least by courts and gardens only, from the summit of one hill to the other. The Golden House of Nero rose upon the area of a considerable portion of the city, including the slope of the Cælian and the Esquiline, as well as the whole summit of the Palatine, and crossing from one to another on long arched corridors. Again, the masses of the population were ousted from their ancient localities, and driven to perch themselves farther and farther from the centre of the city. As regards, indeed, the Golden House, it is true that a very few years saw the demolition of all the additions, at least, which Nero had made to the palace of his predecessors. A large part, however, of the space it occupied was certainly never restored for the inhabitation of the citizens. The Colosseum, so called, as is commonly said, from the Colossus of Nero, which adorned the vestibule of his palace, almost at the western entrance of the great amphitheatre, stands on ground which must once have been crowded with plebeian dwellings, and to this place of public resort were attached outbuildings, including reservoirs and fish-ponds, on the Cælian Hill. The Baths of Titus cover also a large area taken from the imperial residence, and transferred by the usurping dynasty to the people for their recreation.

Pendentive Domes.

The earliest specimen of pendentive domes is probably the little tomb in the Via Nomentana, at Rome, which, though probably of earlier date than the church of St. Nazario and Celso, carries out the pendentive principle to its full development, just as we see it treated at a later period in the double gate and the Golden Gate of the Temple area at Jerusalem, most probably erected under Justinian. All these domes are segmental in section. The pure form, however, of a pendentive dome—that is to say, the form in which the pendentives and the upper portion are really veritable parts of one and the same original dome, in the plan or base of which the rectilinear figure is inscribed—was not long adhered to. It was soon felt that the disc enclosed by the circular moulding looked flat and ineffective, and the idea early suggested itself of converting the circular moulding into a massive cornice, raising upon it a new dome of such proportions as should approve themselves to the eye, and allowing naught but the pendentive to remain of the original dome. No bolder idea was ever introduced in constructive architecture, for now the dome, instead of being, as at the Pantheon, supported firmly by a solid wall throughout every portion of its circumference, finds its conditions absolutely reversed; for in no portion of its circumference has it now a solid support, but all floats upon vacuity, suggesting the poetical similitude to Procopius that the dome of Sta Sophia appeared as if suspended by a chain from heaven. Pendentive domes in neither of their typical forms seem to have been frequently or customarily made use of in the more genuine Classic ages, though in modern times they have both been very wisely adopted into the revived Classic styles. They were, in fact, the special characteristic and the great glory of the Byzantine style. Mr. E. A. Freeman, on this subject, remarks:—"The offspring of the arch is the vault, and of the vault the cupola, and this majestic ornament is the very life and soul of Byzantine architecture, to which every other feature is subordinate. Its use had hitherto been mainly confined to circular buildings. To make it the central point of a Christian

temple was a grand and bold idea, and one which involved a complete revolution in the existing principles of architecture. . . . And not only did the grand cupola crown the whole pile, but the smaller portions are often covered with smaller domes and semi-domes. . . . The eye, habituated to the long naves . . . of our own great churches, is totally bewildered with so huge a pile, with apses and semi-domes 'sprouting out,' to use the expression of Mr. Hope, in every direction, and all circling round the vast central cupola like tributary rulers encircling an imperial throne." It is thought by some that the Byzantines borrowed the pendentive dome from Persia, but this seems insusceptible of proof; indeed, it exists of earlier age in Italy. It is more certain that, having once discovered its wonderful utility, it was communicated by them to every region to which their influence extended; and that, having been learned from them by the Mohammedans, it became the conspicuous feature of the architecture which extended continuously from the Bay of Bengal to the Atlantic.

Exactitude in Sculpture.

Exactitude of imitation is much more requisite in sculpture than in painting; but, nevertheless, even in this art, if it display itself in ostentatious trick or artifice, such as colouring statues to imitate life, it becomes offensive and disgusting to all experienced and intelligent persons; for such persons never look for deception, which they know to be mere trick, the pleasure of which ends with the surprise that it has once occasioned. To attempt to produce it, therefore, by mixing two separate arts, is to weaken the proper effects of both, as the trains of ideas which severally belong to each have arisen separately in the mind, and do not therefore readily or properly unite. The great sculptors of Greece, however, often composed one figure of different splendid materials, such as ivory and gold, marble and brass, &c.; but this was not for the purpose of any deception or greater exactitude of imitation, but to produce an imposing effect of splendour and magnificence in the ideal or allegorical images of supernatural beings. They also frequently made the eyes of silver, gems, or some other shining material, but never exactly to resemble the life, and certainly not for the purpose of deception, but merely to keep up that energy and vivacity of expression which characterised the other features, in which it could be exhibited in forms; whereas in the eyes it could only arise from brightness or colours. The effect is, accordingly, the most animated and striking that can be conceived in the instances which we have remaining of bronze statues with silver eyes, of which there are many, and some of exquisite work, but all of a small size. From these, nevertheless, we may form some ideas of the imposing and commanding effects which those of heroic or colossal dimensions must have had when exhibited as objects of devotion in the temples. Those of Phidias and Lysippus must have been sufficient to reconcile even a Jew or a Mohammedan to idolatry. Sculpture, being properly a simple imitation of form, does not seem intended to afford any merely sensual pleasure to the eye; for such pleasure can only arise from colour or variation of light and shadow, whereas sculpture, considered abstractly, has no colour, and the lights and shadows in which it most delights are regular, feeble, or harsh, so as to be always either too much or too little broken to suit painting, and therefore certainly not in themselves pleasing to the eye. Rembrandt laughed at those artists who talked of improving themselves in painting by studying the antique sculptures, and showed, as his cabinet of antiques, a room furnished with cloaks, hats, turbans, &c., of various stuffs and tissues. As a mere painter, whose object was to please the eye, Rembrandt was quite right; and, indeed, no man ever understood that branch of the imitative art better, or practised it with more delicacy and success, his works arriving nearer to abstract perfection, in what they pretend to, than those of any other modern artist in any branch of art.

Greek Love of Form.

In every fibre of their nature, beauty of form—in which they required that the effective and good should appear clothed—was felt to be so profound a necessity, that the Greeks required it not only in those mental productions whose peculiar province is the beautiful—in art, namely, with its various branches, as poetry, architecture, sculpture and painting—but in those also which especially thrive after cognition—science, with its several appearances, history, philosophy and physics. Nay, even in oral discourse on strictly practical concerns, whether of the State or of individuals, the charm of beauty could not be dispensed with: hence the high perfection of their oratory. But this spiritual craving of the Hellenes for beauty of form could have been excited only by an uncommonly vivid sense, nor could have been gratified without a quite peculiar aptitude for the plastic development of it; and, in fact, we know of no other nation endowed with both gifts so largely as they were. The earliest evidences of this inclination towards beauty of form appear in the religious lessons of Orpheus and Musæus; of which, indeed, no remains have come down to us,

but concerning which, at least, we certainly know that they were expounded in verse, thus early appearing in an artistic form with tendencies towards beauty. How early, too, the Hellenes had arrived at the development of this beauty in speech is proved by the high perfection of the hexameters of Homer, who lived a thousand years before our era; from which may be decisively inferred a longer previous use of that measure. We see the talent for beauty in plastic arts already showing itself above five hundred years before their entire perfection, in the admiration of beauty in individual men, and in the high estimation which it receives in the poems of Homer. In this respect there is a very characteristic passage in the 2nd canto of the "Iliad," where it is said of Nireus, in the catalogue of the ships:—"Nireus, in form (the faultless son of Peleus sole exempt), fairest proportioned of the sons of Greece: but he was heartless and his men were few." The Greek disposition is here strongly marked by the circumstance that, although he is allowed one element of that highest aim of Hellenic endeavour, beauty, namely, in the fullest measure, there instantly follows the remark that he was wanting in the other element, excellence of character. Now, the reason why Achilles, by Homer and all the Greeks, was extolled as the principal hero, was his possessing both these properties in the highest degree; on which account, too, Homer distinguishes him alone by the epithet, the faultless. Still, how well the Greeks could nevertheless appreciate spiritual worth, even when quite destitute of beauty, there needs no more striking proof than the boundless reverence paid by the first men of his time to Socrates, the noblest and purest incorporation of character, although his exterior presented the sharpest contrast to the so-called Grecian ideal. As for the worship of beauty peculiar to the Greeks, it might be further proved by many examples. On the occasion of the Battle of Plataea, where the very existence of all Greece was at stake, Herodotus does not fail to notice that the Spartan Kakicrates was "the most beautiful of all in the Greek army," not of the Lacedæmonians alone, but of all the other Hellenes as well. In Æginus, an Achaian city, Pausanias tells us, where there was an image of Zeus in the age of boyhood, they used in ancient times always to choose for his priest the most beautiful stripling that could be found there.

The Inscriptions in the Beauchamp Tower.

Most of these inscriptions were made by men of whom no other trace is left. Like the beings of an older order of creation, they have completely passed away, a few marks in the granite alone remaining to tell the brief story of their lives. Yet, read by the light of such memorials as Fisher and Howard have left behind, how full of saddest eloquence they seem. How strangely laden with a sense of desolation, of heart-weariness, of abandoned hope, are those rudely-cut old Italian words in the shield on the right hand of the first recess in the wall:—"Dispoi: che: vole: la: fortuna: che: la: mea: speranza: va: al: vento: pianga: ho: volio: il: tempo: perdudo: e: semper: stel: mea: tristo: e: disconteto:" which may be thus rendered into English:—"Since Fortune has scattered all my hopes to the winds, I wish that Time itself were no more, my star being ever sad and unpropitious." The signature appended to these words is "Willm. Tyrrel, 1541." But history has left us no clue to the person or crime of any so named. Fancy will picture him in various guises. From the genuine agony of his utterance one could readily believe he was lying at the time under sentence of death. Another unknown, of the name of William Rame, has left his wisdom printed on the wall under date 1559, in the following pious proverbs:—"Better is it to be in the house of mourning than in the house of banqueting. It is better to have some chastening than over much liberty. There is a time for all things—a time to be born and a time to die, and the day of death is better than the day of birth. There is an end of all things, and the end of a thing is better than the beginning. Be wise and patient in trouble, for wisdom defendeth as well as money. Use well the time of prosperity, and remember the time of misfortune." These lessons are among the commonplaces of our great store of verbal wisdom, but no one can read them on the stones of Beauchamp Tower as commonplace. They seem to come like drops of blood distilled from a lacerated heart. In the third recess part of an inscription runs thus:—"Unhappy is that man whose acts doth procure the misery of this house, in prison to endure. 1576. Thomas Clarke." Who was Thomas Clarke? No one knows. Under it we read:—"Thomas Miagh, which lieth here alone, that faine would from hence begone." And the verse goes on to say that he has been put to the rack in vain, but is still kept a close prisoner. An inscription, consisting of a pair of scales and the following words, catches the eye:—"1585. Thomas Bawdewin, Juli. As virtue maketh live, so sin causeth death." These men have sent their names down to posterity, but nothing more. In everything else they have perished, and the memory of their offences with them, as entirely as if they had never lived and provoked the jealousy of this world's rulers.

NOTES AND COMMENTS.

PLANS have been prepared by Mr. BRYDON for technical schools which are to be erected on the site of the White Lion Hotel in Bath. The accommodation provided is as follows:—Basement—workshops for engineering, carpentering, plumbing, coachbuilding, &c.; also mechanics' laboratory, engine-house for the shafting, heating chamber, and boiler-house for hot water. Ground floor—large lecture-room to seat 240, with preparation-room adjoining, small lecture-room to seat 100, library and museum, and the superintendent's room. First floor—the art classrooms, comprising modelling, elementary, advanced and life classes, besides three general classrooms and the art master's room. Second floor—Large laboratory for chemistry and physics, one laundry and two cookery classrooms, and two general classrooms. Cloak-rooms and lavatories for men and women are provided on the basement, ground and first floor. The architect's estimate of cost of building is 18,500*l.*, to which must be added commission 925*l.*, furniture and lighting 2,000*l.*, contingencies 1,000*l.*, making in all 22,425*l.* A sum of about 5,400*l.* is available, and it is proposed to borrow 17,000*l.* at 3½ per cent. The Municipal Buildings Committee are about to have the quantities for the new building taken out and to advertise for tenders.

If Bath deserves to be described as "that beautiful city which charms even eyes familiar with the masterpieces of BRAMANTE and PALLADIO," to employ MACAULAY's words, the credit is due to the two WOODS. Little is known about them. In 1722, JOHN WOOD commenced practice in Bath, and although he died in his fiftieth year, he left many memorials of his ability, not only in single buildings, terraces and crescents, but also by his skilful planning of the streets. A lecture has been given in Bath by Mr. R. E. PEACH on "The Two Woods and the Bath Renaissance," but he was not able to impart much information about the architects. He said that the elder WOOD began his grand work in 1722 within a few yards of where they were assembled that evening. Both father and son had lived in the same house at Batheaston, and there they died—the father in 1754 and the son in 1781. In conclusion, Mr. PEACH said "both were men who, taking them all in all, we shall never look upon their like again in this city, which they made." Mr. PEACH promised to enter more fully into the subject on another occasion, and it is to be hoped inquiry in Bath will enable him to dispel the obscurity which surrounds two most able architects who lived and worked little more than a century ago.

In an address to the Shropshire Archæological Society, Mr. A. P. HEYWOOD LONSDALE gave some curious information about his Shavington Estate, which reveals the kind of peace which used to prevail in country districts. The original name, as given in Domesday, was "Savintone." So early as 1292, "Shavinton," "Schavynton" and "Schavyngton" appear in deeds. There was a curious tenure in connection with the spring which furnished water to the large pool in Shavington, and for which an annual rent had to be paid with an arrow barbed with peacock's feathers. Shavington was bought in 1461 by Sir JOHN NEDHAM (as the name was then spelt), his successor being WILLIAM, who was enfeoffed in 1843. One of the successors was created, in 1625, Viscount KILMOREY, and in his time arose difficulties about the tenure with his neighbours, the CORBETS of Adderley. A sort of family feud continued in reference to the agreement of Sir ROBERT NEEDHAM, in 1556, with Sir ROWLAND HILL (the then owner of Adderley) to hold the manor of Shavington of the lord of the manor of Adderley at the eighth part of a knight's service and 12*s.* 6*d.* annual rent, which was finally confirmed by legal decree in 1610. Another cause of dispute was in regard to the accommodation in the parish church of Adderley, where the CORBETS occupied the chancel as patrons, and where the NEEDHAMS had to be content with seats in the rector's pew. Viscount KILMOREY then, with the approval of the bishop, built an aisle or transept on the north side of the church for the use of his family, and this caused further discord between the rival magnates, and on one occasion Sir JOHN CORBET had his Irish footboy buried in the KILMOREY vault, over the body of the late Viscount.

This proceeding naturally gave great offence, and the Earl Marshal was petitioned in the matter, and ordered CORBET to remove the body. On one occasion a free fight between the retainers of the two families took place in the church. Another bone of contention was the road from Shavington to the church, which passed through two fields belonging to the CORBETS. Here it was merely a cart-track, and Sir JOHN CORBET refused to keep it in repair. This also was the cause of a lawsuit, which dragged on interminably, and the road was never repaired. The last Lord KILMOREY, with dry humour, set up a notice-board inscribed, "This road is impassable, not even jackassable; Who on it would travel must bring his own gravel." The Shavington Estate now comprises the historic property of Ightfield, which still retains its moated residence. The house is small, but prior to 1579 was smaller still.

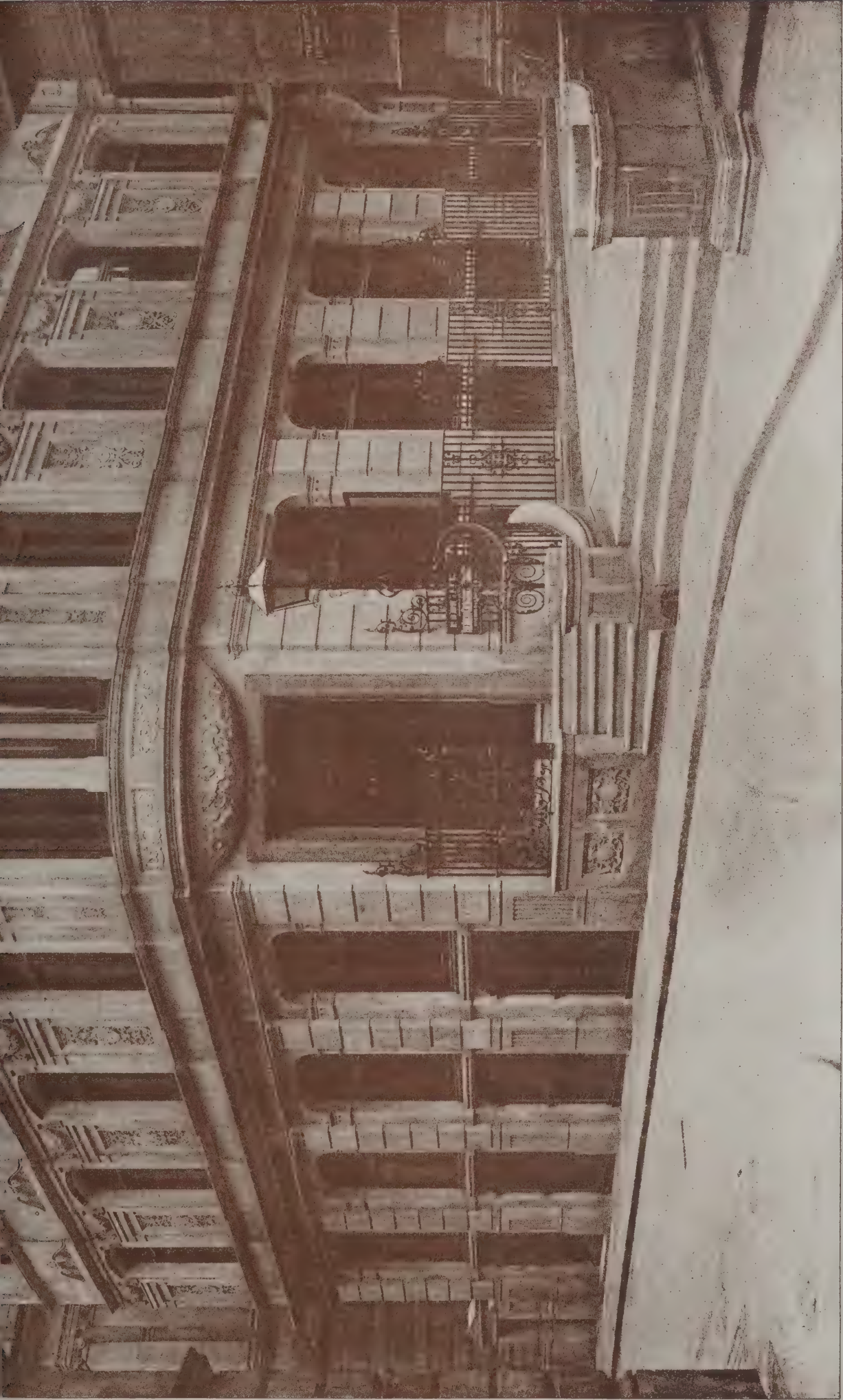
THE report of the Glasgow Institute of the Fine Arts, which was read at the general meeting on Saturday, was more satisfactory than the reports of late years. Hitherto the Institute has not paid expenses and interest on capital. But as the four shops which are on the street level have been altered, a higher rent will be charged, and instead of 700*l.* a year 1,000*l.* will in a short time be derived from them. The exhibition galleries are becoming more sought after for meetings, bazaars, &c. Last year's exhibition produced an increase of 260*l.* over the receipts of the preceding exhibition. The value of pictures sold was 3,923*l.* 10*s.* Among the year's expenses were law costs amounting to 300*l.* It appears the property was originally held by four members, two of whom had died. The Council considered the arrangement was irregular, and to rectify it and obtain a proper title it was necessary to pay 300*l.* to lawyers. According to the report the present state of the membership is as follows:—Contributors of 25*l.*, 30; contributors of 10*l.*, 623; contributors of 5*l.*, 45—a total of 698, of whom 25 have been elected since last report. Of the members, 5 are lady members and 91 artists. The members have every reason to look forward with confidence to the future of the Institute.

MEISSONIER is still a name to conjure with in France, for the price of admission to the approaching exhibition of a selection from his works on the opening day, which is March 6, will be 100 francs, or 4*l.* It is true that those who are willing to pay that sum can have a season ticket, but probably few will avail themselves of the right to visit the exhibition when the price is moderate. The receipts will be divided among three charitable institutions, viz. a Night Asylum, Aid to Victims of Duty, and the Orphanage of the Arts. Already there are eleven hundred works arranged to be shown, but it is not to be supposed that they are all elaborate paintings on a miniature scale, for included in the number are sketches and studies which M. MEISSONIER jealously guarded from the public or critics. It is anticipated that a large sum will be obtained. After the exhibition some of the works will be sold by auction.

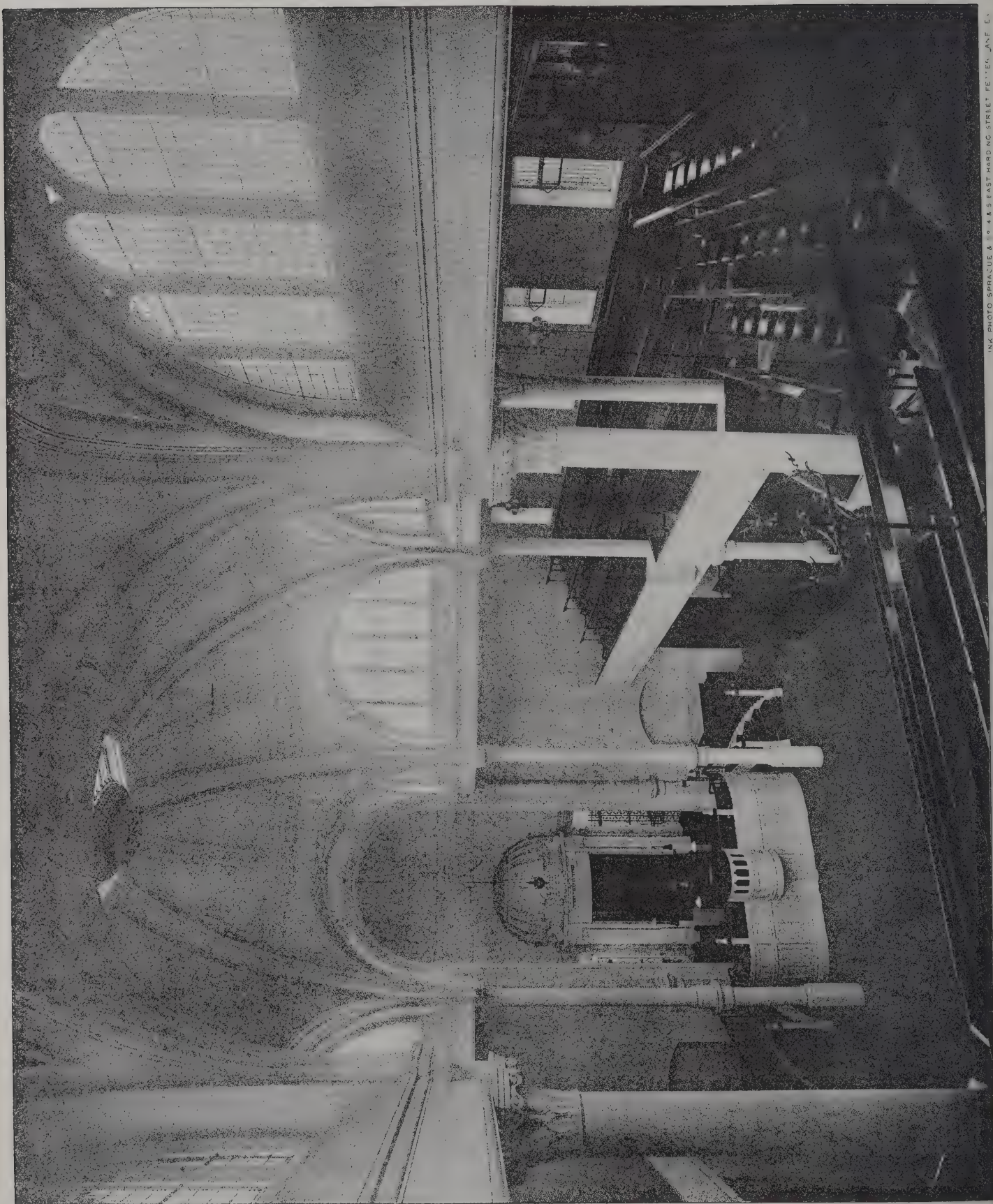
To some archæologists Heliopolis sounds as sweetly as Mesopotamia to people of a different class. It is no wonder, for APOLLO delivered his oracles there. Accordingly it will be generally gratifying to know that Heliopolis is at last about to yield some of its secrets, and the value of the wisdom of its sages may soon be tested in village schools. It appears that the Duc DE DINO obtained authority to explore a site which was supposed to be part of the sacred necropolis of Heliopolis. The operations were directed by M. PHILIP. Already most satisfactory results have been obtained. M. GREBAUT, who was associated with the museum at Ghizeh, has visited the works, and according to him there is no doubt that the excavators have opened the necropolis, which was of an immense area. Heliopolis was one of the most famous of the Egyptian cities, and, says HERODOTUS, "the Heliopolitans are esteemed the wisest of all Egyptians." The Greek historian was afraid to express their theological discourses; but there is nothing sacred to a modern sapper or *savant*, and if the tombs can furnish knowledge, the whole world will soon know of it. If the French will confine themselves, like the Duc DE DINO, to archæological investigations, the English will have no jealousy about their stay in Egypt.

Die Architektur. Erb. 10^{te} 1893





THE ANGLO-CALIFORNIAN BANK, AUSTIN FRIARS, LONDON. E.C.
F. ROBERTS, Architect.



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THE HAMPSTEAD SYNAGOGUE.

The Architect, Feb. 10th 1893.



IN PHOTO SPRAGUE & CO. 4 & 5, T. HARDING STREET.

THE HAMPSTEAD SYNAGOGUE.

DELISSA JOSEPH, F.R.I.B.A., Architect.

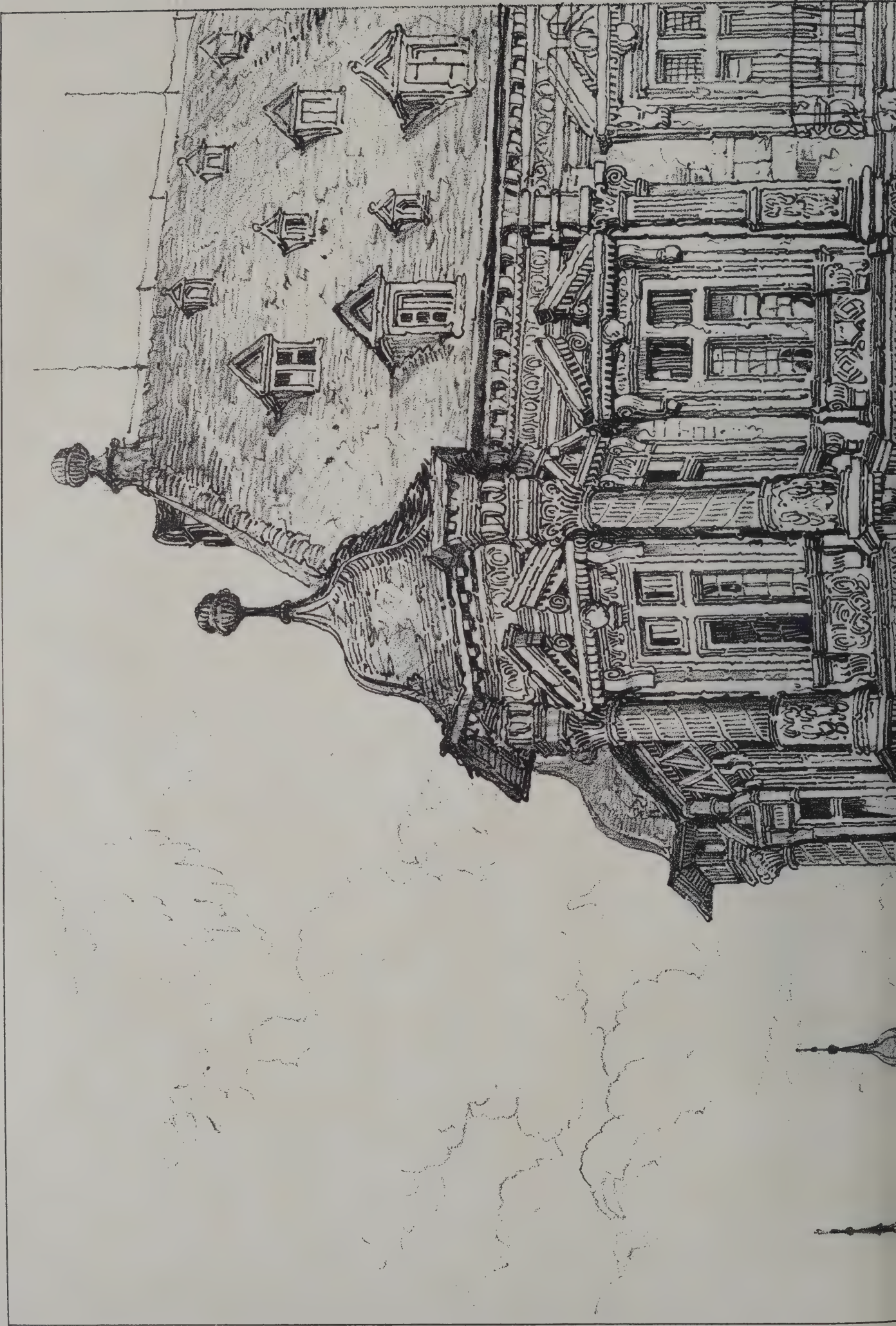




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CHÂTEAU DE MARTINSBOURG, MAYENCE.

Drawn by SAMUEL PROUT.

ILLUSTRATIONS.

ANGLO-CALIFORNIAN BANK, AUSTIN PRIARS.

FOREIGN architects who visit the City express surprise to see so many excellent buildings in out of the way places. But as London is not planned like their cities, there is no avoiding the drawback which prevents such a building as Mr. ROBERTS'S from being more generally known. The illustration is from a photograph by Messrs. BEDFORD LEMERE & CO.

HAMSTEAD SYNAGOGUE.

THIS synagogue is situated in Dennington Park Road, West Hampstead, on the site of Laurieston Lodge, and was erected to meet the needs of the many Jewish families residing in that growing district. The building would have been placed in West End Lane but for the need of obtaining an eastward aspect for the ark.

The façade is carried out in red brick and red stone, the small amount of detail being Romanesque in character. The leading feature of the external design is the main tower, which is an uncommon feature in synagogue designs, and which is a conspicuous object for a considerable distance. This tower contains on the ground floor the main hall; on either side in the subsidiary buildings are the vestibules, which lead to the gallery staircases, enclosed in small wings constituting the end features of the principal elevation.

The main building is octagonal on plan, and in that respect differs from any other synagogue in London. At the corners of the inner octagon are columns carrying the galleries, which occupy the space between the inner and outer octagons, the columns leading up to a dome of great height. The rake of the gallery is exceptionally steep, in order to give a uniformly good line of sight.

The Continental system of grouping the ark, the reader's platform and the pulpit at one end of the building is here adopted for the first time in London. Behind the ark, obscured by wrought-iron grilles, is the choir. The inside of the building is finished throughout in pure white.

The seating capacity, when all the benches are in position, is 700 sittings. Each seat has a rising flap, with box underneath for prayer-books, and each seat has a hinged book-flap in front. There are seven entrances to the building on the ground floor, the principal entrances being through two pairs of double swing-doors in lobbies, to prevent draughts. The lighting is effected by a sunburner of 171 lights, and by standards and brackets. The heating is a combined hot-air and hot-water system. An ample system of ventilation is provided.

The general contractors were Messrs. JOHN ALLEN & SONS, of Palmerston Works, Kilburn; and the architect is Mr. DELISSA JOSEPH, F.R.I.B.A., of 17 and 18 Basinghall Street.

CHATEAU DE MARTINSBOURG, MAYENCE.

THE ORIGIN OF BUILDING.*

(Concluded from page 88.)

A NOTABLE building in Rome is the Coliseum, the great Roman circus, a part only of the outer shell remaining. The storeys of broad stone arches are here seen, each storey of slightly diminishing proportions as they ascend, and the whole crowned by a tall balcony. This building is a combination of four styles of architecture, at least in the columns introduced between the arches. On the ground storey the columns are Doric, on the second Ionic, on the third Corinthian, and on the fourth a combination again, which the Romans invented, of Corinthian and Ionic, called the Composite and Roman order. As to the interior, you will notice the statues, the idea of which the Romans brought from Greece, and introduced into their buildings in a different way. It has been a circus or amphitheatre, wherein some of the most bloody and cruel scenes have been enacted; it has also been a fortress and a hospital, a stone quarry, and barely escaped being turned into a woollen manufactory. In 1750 it was consecrated to the Christian

Martyrs. It is now a ruin. It was probably completed eighty years after Christ, and would hold about 100,000 spectators.

The Romans were road-builders, founders of walled cities and conquerors, and the triumphal arch or gateway marked at times the "completion of a road," the "construction of a bridge," the "entrance to a city," and, beyond all, "the arch under which passed the victorious army after a successful campaign." The triumphal procession marched along the Tiber, and passed down the Via Sacra into the Forum of Trajan, in the heart of the city. Along this Via Sacra were constructed the various triumphal arches. The first was erected by Titus, another by Severus, and Constantine also erected one. The three exhibit different styles of development, the one by Constantine being the most perfect, and is here shown. The style is Roman Composite, combining the Greek, Corinthian and Ionic.

We have here a view of the Basilica of Constantine. It is necessary to explain the cause of the new departure in architecture at the time the building was founded. An improvement (or otherwise) in art has invariably been caused by some great change in the religion or the policy of nations, and so we find it at this time. From 117 A.D. to 306 A.D. art, with a few exceptions, was not flourishing. We find the fourth century ushering in a new epoch in religion and architecture, the one having great influence upon the other. The Christians at Rome, who had previously been fearfully persecuted (and what buildings they had had been destroyed), were now permitted to openly avow their creed, and we find in 324 Constantine—who, if he had not embraced Christianity, was favourable to its followers—altering the laws, and ordering that the churches that had been demolished during the previous reigns should be rebuilt, and the property of the Christian church restored. He exempted the Christian clergy from personal taxes, and granted donations and privileges to the churches.

The Christian religion may be said to have rendered a most essential service to the arts, and contributed to the revival of the genius of the architects. All the remains worth retaining from the ruins of many of the ancient Roman basilicas (or open unroofed halls of justice) were re-used and embodied in the buildings they erected at this time for religious purposes, and have by this means been preserved. With these columns and arches taken from old times the Christians erected their places of worship, which, although closely related to the Pagan Roman style, still has a distinct style of its own.

We have now come to the view which I wish to compare with the most elaborate and latest of the Pagan Roman style. It is that of San Paolo at Rome. The contrast is most remarkable. Starting with the roof, this one is flat and of wood. The walls, again, do not rest upon massive piers, but are carried by the columns, which, instead of standing out from the walls in front as an ornament or to assist only to carry the roof, are here brought under the walls, and are made, with the arches from column to column, to support the whole. Again, we notice the absence of the cornice and entablature over the columns. On each side of these rows of columns there is an aisle with a lower roof than the main roof, which is formed, therefore, into a clerestory, from which windows for light are obtained. The general lavishness of enrichment has disappeared. By the arrangement of the columns directly under the arches, and the omission of the entablature, we have a new architectural element—the Latin or Italian arcade. The further end of San Paolo, you will notice, terminates in a semi-circular half-dome, the entrance to it forming an arch. This is all that remains of the "arch," "vault" and "dome," as in the Pagan Classic. The Christians called it their triumphal arch, and over it always appeared a representation of the Saviour. San Paolo was burned down in 1823, but such was the veneration in which it was held, that it was rebuilt, as nearly as ever possible, after the original design.

It is well known that the Roman Empire began to decline in the commencement of the fourth century A.D., and the Emperor Constantine, who had hitherto, when at peace, resided at Rome, transferred the capital from Rome to Constantinople, or Byzantium, as it was then called, and attempted to make it rival Rome itself in monumental grandeur by erecting immense public buildings. Constantine built a cathedral, dedicated to St. Sophia, and a church to the Apostles. The Latin style of the early Christians now, upon the removal of the capital from Rome, developed into a more decided style, called after the new capital Byzantine, and one of the best specimens is the cathedral of St. Sophia, Constantinople. The cathedral built by Constantine was destroyed by fire, and the one erected soon after by Justinian, in the year 532, was completed in sixty years. The Emperor Justinian, in his admiration of his magnificent edifice, is said to have exclaimed, "I have vanquished thee, O Solomon!" and almost with justice could he glorify himself, for the dome of St. Sophia is the largest carried on piers in the world.

It is exceedingly difficult to draw the line between the Byzantine and the Romanesque styles, and indeed some authorities decline to draw the line, and link them together as "Byzantine and Romanesque," although the true examples of

* *The Origin of Building: Its Progress and Development. A Non-technical Review of the World's Architecture.* A lecture by Mr. Howell J. Williams, read at Anderton's Hotel on Thursday, February 2, before the members of the Olavian Society.

each are separated by several centuries. There is a connecting link, however, in the cathedral at Pisa between the Latin, Byzantine and Romanesque, combining all three. Here we have the cathedral, the baptistery, and the leaning tower. You will observe from the exterior of the cathedral that the structure is called a cathedral out of compliment, as it were, it being but little higher than the early Christian basilicas; but the two additional storeys just save its dignity, and the edifice being of white marble, is described as being exquisitely beautiful, presenting the appearance of lacework. I think the peculiar leaning tower is worthy to have a few remarks concerning it. A remarkable circumstance in this tower is that the top overhangs the base upwards of 13 feet, giving it the leaning appearance observed. This peculiarity is also observable in several other Italian belfries. It is due to defective foundations. There is conclusive evidence that the failure exhibited itself before the building was completed, for on one side the columns were built higher than on the other, and to this the building doubtless owes its preservation. We are better builders now, though—at least, in this respect, the care taken in the foundations of a large building being, as a rule, greater than that bestowed upon any other portion. And a very good thing too; and I am sure you will agree that if any scamping is to be done at all, it ought never to be done in the foundations.

Before continuing the styles direct onwards to the Romanesque, which ought to be the next link, I think we might turn aside for a few moments just to have a peep at the Moorish or Saracenic style, which is perhaps as interesting, or even more so, than any of the others, and the history of architecture would be incomplete without it. This once-powerful race conquered a great portion of the East and the Holy Land. Here they erected a mosque. This mosque is that built by Omar at Jerusalem, and is supposed to have been the first of their erections outside the limits of Arabia. It has been added to from time to time. The Moors, passing from the East along the north of Africa, crossed over and conquered a greater part of Spain in 780, and the earliest example of their erections there is the Mosque of Cordova, which was finished in 794. The style of this building, although still being remarkably Moorish, was with very little doubt copied from those then existing in the East. The interior presents an appearance of a forest of columns, composed of jasper and other marbles, and they bear a strong resemblance, I think, to the Corinthian and Composite styles. After the reconquest of the city by San Ferdinand in 1238 the mosque was converted into a cathedral. The most perfect example existing, however, of the extent to which sumptuousness of ornament and enrichment can be carried is to be found in the Alhambra, the residence of the Moorish kings of Granada, erected between the years 1240-1348. In this building there are, indeed, no traces of art peculiar to any other nation, and the composition and distribution of the ornamentation are arranged with rare skill. The Alhambra was a palace within a fortress. The great fortified height overlooking Granada is shaped something like the Acropolis at Athens. The palace itself resembles those of ancient Rome in the respect that it consists of two courts surrounded by various apartments, all upon the ground floor (the Orientals and Arabs are rather lazy, you know, and don't like stairs). One of the courts is called the Court of the Lions. The lions are seen carrying the fountains. The Court of Lions led up to the gate or entrance to the Hall of Justice. But it would be an injustice for me to attempt a short description beyond what I have given of this model of pure Arabesque architecture, as a very poor notion would be conveyed of the splendid work it contains. I need, therefore, only add this—that every part of the walls and ceilings is covered with a mass of ornament, enriched with gold, giving very great evidence of the high degree of refinement and luxury the Moors had attained previous to their overthrow.

We now come to the Romanesque style, which should have followed the Byzantine, only we turned aside first to visit the Alhambra. Of the Romanesque there are several sorts—Italian, German, Norman and Norman-English. It flourished in the eleventh and twelfth centuries—the era of the Crusades and cathedral building, and it may also be regarded as beginning a new era in the history of Europe. One of the first examples is Milan Cathedral, although not the best or the most decided in style, it being in a great degree Gothic. The Romanesque has all the elements of the Gothic, and some authorities even call it Round Gothic—rather a shock to those who cannot associate Gothic with any other than pointed windows; but it is not a window alone that constitutes a style. The chief features of the Romanesque are a few large round principal windows, with mullions and reveals surrounded by a number of slight clustered Gothic columns, and a number of small loophole slits for light generally, then great spaces of massive dead wall relieved by buttresses, a vaulted roof of stone (not a dome) on heavy piers or clustered columns. The interior of Milan Cathedral is a better example of the style than the exterior, though still mixing up the Pointed Gothic,

and not so beautiful and scarcely equal to it. This is, however, sufficient to show what is meant by vaulted roofing. The original cathedral was built in the year 900, and almost entirely rebuilt in the twelfth century. The principal specimens of the Romanesque order are, however, found in Germany, some also in France. Those in Germany are the cathedrals of Spire, Mayence and Worms. In the eighth century the north of Europe was brought into close contact with the south and east by the conquests of Charlemagne, who afterwards erected in different parts of his extensive dominions many grand buildings dedicated to Christianity, and naturally carrying the arts and architecture of Italy to the northern parts of Europe, and combining them with their own heavy style, formed the Romanesque. One example is the cathedral of Mayence. The German princes laid claim to being called Emperors of Rome, and their great ambition was to build in the Roman manner, that is, with vaulted roofs, and this with the most imperishable of material, stone, and it was a great triumph when their great cathedrals were successfully vaulted over. The cathedral of Mayence was commenced in the tenth and finished in the eleventh centuries. That of Worms was commenced in 1016, and added to in the twelfth, fourteenth and fifteenth centuries. I do not like to omit from the list of views the cathedral of St. Mark's, Venice; but time will not permit me to dwell upon the history of this most beautiful building, which is really deserving of a lecture on its own account, and I will simply add that it may be regarded possibly as a connecting link of the Romanesque, Byzantine and Gothic.

We now come to the style of architecture best known (at the present day, at least) in England—the Gothic. It is extremely difficult to fix upon the commencement of this style of architecture. It is well known and accepted that the strict Gothic characteristics are pointed arches, pointed and flying buttresses and pointed everything, also an immensity of geometrical tracery in windows and on ceilings. The pointed arch was used by the very early Pelasgians in their rough way, and was used by the Moors and Indians, and the Chinese have something of the kind. This style was abandoned until the Middle Ages, but it was then, however, taken up with increased vigour at a time when the Goths were, more or less, a great influence in Europe. The view on the screen is the exterior of Notre Dame, Paris, a noble specimen of Gothic architecture. The Gothic style appears to have been adopted by Western architects (there are no true Gothic buildings in the East, at least not that I am aware of) in the eleventh, twelfth and thirteenth centuries, several rare edifices being erected, in which it was more marked in the lower part of the building than the upper, on account of the pointed arch being considered to present more resistance in supporting the superstructure. From this use (which is very noticeable in this cathedral), first originating in the demand and care for solidity, it was extended equally to all parts of a building. By comparing the elevation (that is, the view of a building obtained by looking direct at it) or upright appearance of Notre Dame with that, say, of Pisa or San Paolo, which you may remember we had just now, the difference and the change from a basilican form to a cathedral form is very clearly seen. Notre Dame is one of the oldest Gothic churches in France, commenced 1163. It is ornamented with 1,200 statues. In great contrast to Notre Dame, Cologne Cathedral may be taken as the type of the Decorated Gothic and the finest of the Gothic cathedrals.

I feel it would be undesirable for me to go into anything like a technical analysis of the details of these buildings, as none but those in the profession would understand the terms, but in producing the buildings as a whole before us we are able to comprehend clearly from optical observation the difference in the various styles, from the Greek temple to the Christian cathedral. Cologne Cathedral was commenced in 1241, and left only partially built with a temporary roof in 1500, and it remained in that state until 1830, when the original plan was continued until the building was completed as shown.

Gothic buildings became very general throughout Europe, but each nation has added characteristics of its own. It is principally used for ecclesiastical erections, but private and public buildings, mansions and palaces, have been very successfully erected in this style. Just to show how the Gothic became stamped with the features of the land of its adoption, we have the cathedral at Florence, an example of Florentine architecture combined with Gothic. The chief thing missing, and differing from the previous examples you will notice, is the absence of buttresses, pinnacles, &c., and the profuse introduction of horizontal lines. The building was commenced in the twelfth century during the great Gothic rage. The whole of the exterior surface has a coating (in the Florentine manner) of black and white marble panels. The other view I feel I ought not to omit is the Ducal Palace at Venice.

By comparing this edifice with those of the north of Europe, it will be clearly seen how very different from our own is the Gothic of Italy. Here we have a magnificent example of Venetian Gothic. There are no compound piers, no buttresses,

no sharp gabled roofs. The only form of similarity is the distinctive feature of the pointed arch generally. The Ducal Palace resembles in a great degree an Oriental building, and you may remember my remarking that the Moors had had pointed arches, so that this palace forms another connecting link. It is a Saracenic building, except that it has not the Arabian ornament, the gorgeous coloured arabesque.

The walls above the arches are relieved from an appearance of heaviness by the diaper patterned marbles, beautifully coloured, which covers its surface. The architectural colours of Florence are black and white, those of Venice are rose and cream, and the atmosphere being so pure and clear they retain their cleanliness and colour. The idea of the arches and columns being at the bottom is that the building rises out of the water (Venice being built in the water on piles), and taken in connection with this fact it is correct, although otherwise it would not be. The building was commenced in 1350. There are many magnificent examples of Gothic architecture in England, but with these I may deal if there is time in a very short notice later on.

There is another style of the romantic class, and that is Renaissance, and this is chiefly to be found in France and parts of Italy, as an example, the Château de Fontainebleau. By some this style is called the square Gothic, and it may be described as the gradual transition or change from Gothic (which in the fourteenth century became practically not used) to Revived Classic, and I think the best example of Revived Classic is the cathedral of St. Peter's at Rome. St. Peter's exhibits a summary of the three greatest styles that preceded it, the old Roman, the Byzantine and the Gothic. The following are some of the special merits:—It has only two parts, a compact body and a dome. It is all taken in at a glance. A Gothic cathedral, with its many parts, is bewildering and difficult to grasp.

Unlike most of the other cathedrals, St. Peter's is fully finished both as to the exterior and the interior, which is decorated in white and gold. The style of columns, cornices and entablatures is rich Corinthian work in Roman manner, viz. a profusion of enrichment. There is a great similarity between St. Peter's and St. Paul's in London, especially in the interior, as Sir Christopher Wren designed St. Paul's upon the model of St. Peter's, adding a feature of his own, however, in the steeples or towers. The pavement of St. Peter's is marble, the walls are covered with mosaic, and the piers faced with marble slabs. The general roofing of St. Peter's is flat. The two most important buildings in the world for comparison are the Pantheon and St. Peter's, both in Rome. The one the Greek temple in style, the other the Roman dome. Every northern country in Europe has repeated the Roman dome and the Greek temple. In London, for instance, St. Paul's is the one style and the British Museum of the other. The one chief and most important building in the world is St. Peter's. It is built in the most civilised part of the world, Europe, and in Italy, the architectural garden spot of this continent, and by her grandest artists, Raphael and Michel Angelo, and as a Christian cathedral, never having been used for any other creed. As a monument of the Christian religion, St. Peter's is the standard. The other styles of Europe have their rivals in different parts of the world, but St. Peter's is far beyond rivalry.

I feel that the architecture and building of England should really be dealt with as a separate lecture, as it is obviously impossible for me to do justice to Great Britain in a short summary. I have, however, a very few views of the several styles adopted in England, and will place them quickly one after the other without going much into detail. The original style was doubtless the same in this country as elsewhere, coverings of twigs, huts, tents and caves, and the next step was the stonework at Stonehenge; all these we have already had before us in the Celtic, also the Roman. We, therefore, start with Anglo-Saxon. Here is a view of one of the first churches in England of the Anglo-Saxon period. The idolatrous creed of the Saxons gave them no inducement to improvement in building temples, and in 652 A.D., when the Christian religion had taken root, the churches were mostly built of wood and covered with reeds, which practice continued for some time afterwards. It was not until the later part of the seventh century that the art of building in stone was again practised in England. The remains of these are, however, most picturesque ruins.

One of the oldest, if not the oldest, of the abbeys of England is that of Bury St. Edmunds, founded by Canute in 1018. The next style is the Anglo-Norman, and one of the best examples I can place before you is the doorway of Malmesbury Abbey, founded in the twelfth century. The Norman style devoted great attention to their entrance doorways, receding them back and forming porches in the thickness of the walls.

Before passing to the decided English Gothic, we have a very curious view in Bedfordshire, the Priory Church, Dunstable, of a combination of the three styles, Saxon, Norman and Gothic, that from its very curiosity deserves

a place in this history. It was founded in the eleventh century upon a very grand plan, with a lofty tower in the centre, but it appears (from the elevation at least) to have been partly rebuilt at different periods, one portion over the other. The doorway seems from appearance to have been of very large dimensions, and to have been panelled in with a Gothic arch under the Norman one. Then surrounding the Norman we have the Gothic, evidently of thirteenth-century restoration, then a more refined Gothic, and again, when Gothic for a time lost its hold, we have in the towers and parapets a recurrence to the Early English battlemented style, a veritable history of England in stone and bricks and mortar. It was on the doors of this building that the proclamation of the divorce of Henry VIII. from Catharine of Aragon was nailed, she being at Amptill, and refusing to attend to hear it read.

The Gothic was introduced into England about the commencement of the thirteenth century, and is divided into three classes—Early English, Decorated, or Middle English and Perpendicular, or Later Pointed English, and the best example existing is Westminster Abbey, which combines all the styles of the Gothic in Edward the Confessor's Chapel, where we have the Early Pointed, and the interior from Poet's Corner Middle Pointed, and the best example of the Later Pointed is undoubtedly Henry VII.'s Chapel. This is the most elaborate of all, and the work is really magnificent and cannot be surpassed in Europe. There were, of course, other styles of architecture in vogue in England at the same period, as the Gothic, chiefly castellated and domestic, and the chief glories of these are of the period of the Tudor kings and Elizabeth, and to a certain extent we can claim them as the Welsh style. Gothic was no longer used in England, except perhaps a few of its features introduced here and there into buildings, and from the reigns of James I. to Charles II. two of the most noted architects that England has ever possessed, Inigo Jones and Sir Christopher Wren, have left some of the finest buildings of Mediæval times. Inigo Jones adopted chiefly the Italian Renaissance, and Christopher Wren Latin, Revived Classic; and one of his grandest works, St. Paul's Cathedral, I place on the screen, that we may compare it with its model, St. Peter's at Rome. The Italian and French Renaissance and the Revived Classic in some form or another has held its ground in England ever since, but some years ago there was a great rage for Revived Gothic, of which we have in the Houses of Parliament perhaps the finest pile of Gothic buildings (taken as a whole) in the world, designed by Sir Charles Barry. Gothic has ever since then been more or less in demand, many buildings of importance having been erected in this style.

THE ARCHITECTURAL ASSOCIATION.

AT the ordinary meeting of the Association held on Friday evening, the 27th ult., Mr. H. O. Cresswell, president, in the chair, the following gentlemen were elected members:—Messrs. H. W. H. Palmer, F. B. Chester, J. L. Lindlay and A. E. Hughes, jun.

Mr. F. T. W. GOLDSMITH, hon. sec., announced that the first sessional visit would be made on Saturday, February 11, to the church of St. Bartholomew the Great, Mr. Aston Webb having promised to conduct them over the works. The second visit would be on Saturday, February 25, to the new building for the Institute of Chartered Accountants, Mr. John Belcher architect.

Mr. SIDNEY VACHER read a paper. The following is an extract.

The Small Suburban House.

Mr. Vacher, who stated that the houses he wanted to consider would be those letting at annual rentals of 75% to 130%, or even 150%, said:—The suburban householder expects always three reception-rooms and the offices on the ground floor and four or more bedrooms on the first floor, with bath-room, dressing-room or rooms, and as many attic bedrooms as he can get. Generally for the reason I have stated the frontage is as narrow as possible; and when a particularly costly site occurs through being close to a railway station, and the town yet being quiet and secluded, and having a pleasant look-out on land that cannot or is not likely to be built on, semi-detached plans are useful. To plan a good house it is absolutely necessary to study the site, which will suggest and govern the arrangement of your rooms. And I think it wise to lay before myself a set of propositions and requirements that must be fulfilled before I can consider my plan satisfactory. You must not say this scheme is pretty, I think it will do, although you have not arranged space for a store-room, or the only place for the linen cupboard is in the attics, or there is no box-room or proper tank-room. Though these seem accessories, so much depends on them, and it is largely due to these rooms whether it is to be a comfortable house for a good housewife to live in, that they become of utmost importance.

The first requirement I think about the house is airiness'

and so sweetness, for, do what you will, in most houses it is next to impossible to prevent the smells from the kitchen pervading everywhere. On this account I much like the plan with a passage through the house from the front door to the back or garden door. In summer time the current of air through the house makes everything pleasant and nice, and as you come into the house, probably on the north side, and see through the garden-door the sunshine beyond you, and feel the cool air, you really imagine yourselves in the country. The plan I have in my mind is the usual two rooms one side of passage, and library on the other, with offices behind, and the entrance to them under the staircase. Though a common plan, it is capable of special treatment. I do not like a plan that simply delivers you into a house with rooms all round, especially if the light to it and the staircase is from a half landing window. There is always a sense of closeness in such a house that to me is very oppressive. If you can manage to get a hall, a ground-floor window in it I think absolutely necessary—a bay if possible. A hall lit from anywhere above 6 feet from its floor is to me a failure. You had better utilise the space in making your rooms larger, for I would always say make your rooms as large, or to appear as large, as you possibly can. I would always sacrifice breadth for length, for by that means appearance of size is gained.

As for the reception-rooms, I can say but little. Get them as large and as prettily shaped as possible, that is, break up the surface of the walls so as to get variety, but always above all things bear in mind that these rooms have to be furnished and lived in. Try and arrange the furniture, especially in the drawing-room and library. Bear in mind that the space round the fireplace is broad, free from draughts and as large as you can get it. On a winter day, with a big fire, often the cosiest place is quite by the side of the fire, but out of the direct rays of the heat. In ingle-nooks where you can get windows never omit them, but place them high up, the sill at least 4 feet 6 inches or 4 feet 9 inches from the floor.

As to the lighting, especially for small houses, keep the windows as large as possible, proportionately too large. This is, I believe, the secret of the success of many houses. Your client may say it may make a cold house in winter. Not with thick curtains and good fires, and the advantage of large windows for the remainder of the year is everything. Even all the year round the large window area gives a cheerfulness, an airiness to a house that makes that house a success. And one last word about these rooms. Do not be frightened of narrow rooms provided you can get them long, especially if you can get a bay in the side. A sense of size is everything towards comfort in living rooms.

Upstairs your bedrooms have to take their chance. You consider how they will come when you are planning the ground floor, but remember it is economic building as well as good building to put walls over walls, and not to have to carry your first-floor internal walls on girders. The bath-room should not be less than 6 feet 6 inches by 8 feet to make a pleasant one, and, unless it is impossible to plan otherwise, never put the w.c. in it. Of course you will be careful to make the approach to this room as unobtrusive as possible. The linen-closet also should not be put in a bath-room; but do not forget that a linen-closet on a landing, or in a passage as near the principal bedrooms as possible, is essential, and keep it large. Paper it with white glazed paper, and make it pretty, for a good housewife takes pride in her linen cupboard. I do not believe in running the hot-water pipes through it. They discolour the walls, and seem to throw off tiny flakes unless covered; but, remember, put this cupboard in a position no damp can possibly get at it. The box-room is necessarily to be as large as possible.

Generally see that an 8-inch stone ball is let down each flue when completed, and before the scaffolding is struck, to clear the flue of lumps of mortar that may have fallen and stuck, and to all top-floor fireplaces put grates with projecting heads—that is, projecting beyond the bars of the grate. This will generally secure your fires from smoking into the room. I am fond of windows over fireplaces. This necessitates an iron flue-door outside for sweeping. Beware lest the sweep insecurely fixes this flue-door; the wind will get it open, and then won't the chimney smoke till the mischief is found out! I generally cover opening with a York lintel, and have found no difficulty about the flue drawing from the ground floor, but on the first floor I should always use a grate with projecting head. This arrangement is cheerful in a room, but do not make the mistake of putting the top of cill too high. I think it should not be more than 4 feet 3 inches or 4 feet 6 inches from floor. I am particularly fond, as a general rule, of making the mantel-shelf quite high up on the wall. I think it seems to give dignity to the fireplace.

The offices I think as important as any part of the house, for it is getting very difficult to find satisfactory good servants, and not always so easy to keep them. Therefore, I advise arranging the house so that it can be worked with as little labour as possible, and make your servants' quarters as com-

fortable as you know how. You will want a kitchen, scullery, larder, pantry, store-cupboard, beer and wine cellar, w.c., and possibly a shed for a perambulator and a velocipede. Now, on account of expense, it is generally necessary to keep the kitchen down to the smallest dimension. And I think that 12 feet 6 inches by 14 feet 6 inches clear is the smallest you can give; but as this has to be the servants' sitting-room, if possible arrange a bay window where they can sit and work, and make it cosy. The cook, besides a dresser, wants a cupboard, and don't put it in the hottest place near the range, for it will have to hold many things for everyday use that dry up. Now that copper is no longer the fashion, and steel stewpans have taken their place, I think there is no necessity for the whole of the space under the dresser-drawers being used for pots, and two small cupboards can be formed here and will be found quite useful. I think a flue to the scullery is necessary, for either a supplemental small range or a gas oven should always be placed here. To the scullery you always fit a glazed stoneware sink; if you wish to get into the cook's good graces put a wood curb round it. She will damage and break far fewer plates, for dirty plates are greasy and will slip out of the best regulated fingers. Also put to face of wall on which the sink abuts white tiles at least two courses high, and when you have money to spare face the whole of the scullery and larder with white glazed tiles, also the pantry and the kitchen. Treat them like you would a dairy, the latter two rooms with patterned tiles. It's the height of cleanly wall covering and can be made look very pretty. Do not forget the gas point at the side of the cooking-range, so that a jointed bracket can be fixed and the cook able to see what she is doing. As to ranges, the pattern the Eagle people have patented seems the best, but I don't think the doors to the rack over the range is an advantage; they may make the kitchen a little less warm, but the cook is apt to hide things behind them or pop things inside and forget them. A tile back and an open rack at the top seems to me best.

Now, as to ventilation, never neglect a flue next to the kitchen flue to carry off smells and heated air, and make it large, at least 14 inches square. I always try to get one to the fireplaces of reception-rooms on the ground floor also, and fit them all with Sheringham ventilators. They may in many cases act as air inlets, although you provide air inlets in the corner of every room, but at any rate they disperse and, I think, partly carry off the hot air and fumes that hang about the ceiling, caused by gas or lamps. Of course, when the fireplace-flue gets well hot they act as extract shafts. People say it's easy enough to open windows and get plenty of change of air that way, but they seldom do and, when they are forced, are apt to complain then that they get too much change. As regards inlets, I have tried flues 18 inches by 9 inches in the thickness of the wall, facing them on the inside with slate and plastering over flush, delivering the air about 4 feet 6 inches from floor, and fitting with hit-and-miss brass plate, but these brass plates seldom fit and I am inclined to think a door on the Sheringham principle with a ball-catch is better.

I have settled the kitchen with its dresser and cupboard for the cook, and cosy corner for the servants where they can spend their spare time, for in this class of house a servants' hall or room can't be provided. The scullery should always lead direct from the kitchen, no passages between, and I like to have the coal-cellar and larder leading off the scullery and, if possible, a space set aside for cleaning knives and boots; this should be divided off by a screen. The servants' water-closet should, if possible, have the entrance under cover and be screened. I do not object to its entrance being placed inside the house like the other water-closet, for remember your servants are women and live in a rather unnatural and varied atmosphere, especially the cook. The store-room should be near the kitchen, and the wine-cellar lead out of the pantry. This latter, when it can be obtained, is an extremely convenient arrangement. If you can possibly avoid it never make the pantry a passage from the kitchen; both the pantry and kitchen must be separate rooms with doors of their own. I think a pantry next the dining-room with a serving-hatch from kitchen to pantry makes a very workable plan; of course double doors between pantry and dining-room are distinctly nice.

I do not like cellars, especially for larders, it is so difficult to get a current of air through them, but in small frontages they are often necessary. One precaution I would advise, that is, to see that the sewer in the road is low enough so that you can drain them, for if not you will find they are really splendid receptacles for storm water, and it's unpleasant to have a small swimming-bath for weeks under your house. The only immediate remedy I know of is to send for the local fire-engine. And the permanent one is to cover the floor and walls to a sufficient height with a material that water cannot penetrate—aspalte, or slate in cement rendered on face.

There is one item I have forgotten; it must be provided somewhere, don't forget, that is a tool-house and potting-shed for the garden.

Then, as to sanitary work, of course three w.c.'s are essential—

that on the ground floor for the gentlemen, that on the first floor for the ladies, and one in the offices for the servants. As to the former, in a small house I don't know of any spot that is not equally objectionable; of course, placing a hat and coat space with a lavatory before it partly negatives the evil. I have seen it placed off the library and having a secret door, but I did not like it; but of the two most usual places, off the front door, or off the garden door, I prefer the latter. Then, as to the one on the first floor, it is generally easy to arrange this satisfactorily. I always fit the closets with hinged seats, and this one I fit with a slop top, merely providing the housemaid's closet with a draw off sink and a small grating only, so that it shall be almost impossible to use this for slops, &c. A housemaid's closet where she can store brooms, dusters and cans, and draw off water, hot and cold, is essential. Then, I very strongly advocate a valve-closet without any overflow from the porcelain basin and no lead trap under, but to deliver straight outside with a double curve as flat as possible to the soil-pipe, which is open at the bottom and carried up at the top above all windows and is open there. I learnt it from a system published by Mr. Norman Shaw in 1877, and is the healthiest and most sanitary of any I know. Of course you at present will have a goodly percentage of the sanitary experts howling at you, and insisting on sealing everything up at the foot of the soil-pipe hermetically and putting lead-traps under your water-closet. You will find the gentlemen mostly belong to the professor type; they call themselves teachers, but are generally fussy and windy exponents of a more noisier master they toady to, who lays down the law that he has found the perfection of sanitary arrangement, and that it is impossible for this matter in question to go one step further. I would advise any man not to give a guarantee that drains will satisfy the requirements of these gentlemen; of course if your client wants to throw away money unnecessarily, here is a splendid opportunity for him. Don't think I do not advocate good drainage. I say, insist on a man-hole as near the boundary as possible and put in an interceptor the sewer side, carrying the drain through a half-pipe; also if there is any chance of an overflow of storm-water from the sewer in road, put in a valve to stop it. Also put in a man-hole at base of the soil-pipe, and if there is a long length of drain put in a man-hole where it has to turn a corner, and have your soil-pipe open top and bottom. But cover your man-hole with an iron grating so that fresh air may get through the chamber and into the drain in the freest possible manner, of course taking care that you form no *cul de sacs*; where gases may collect this is a much more rational method than introducing the air through a very small talc-flap grating, sealing up all the man-holes hermetically, trapping under the water-closet, and making the air traverse the whole length of the pipe before it escapes at the top of the soil-pipe. Then, when say the lower water-closet is used, the force of water creates suction, and the air thus drawn in has to pass over the surface of the remainder of the system and then float back again, for remember at the sewer end theoretically there is no exit for air, a kind of tide action, at times quite a manufactory of sewage-gas. Do you suppose that those traps under the water-closets in such circumstances remain trapped? I distinctly believe they most frequently are not. You all know the action of the wash-out closet; how you cannot always depend even with a 3-gallon flush that everything is cleared away. Now consider the trap under the valve-closet half full of substance, it will take but little suction to empty that trap of the water. As to the overflow of the basin of the valve-closet trapped and delivering into the box below the valve, I am sure the days will soon come when this arrangement is entirely one of the past. From a sanitary point of view it is as bad as it can be, especially the later patterns in which the holes are enormously large.

I myself dislike all wash-out closets; the only recommendation I can see is that they are cheap and at present pass the sanitary inspector, and some patterns have the trap, the receptacle hidden, hence they can be used in special positions. I think a soil-pipe and drain-pipes should be so arranged that they could be cleaned and should be cleaned at least once or twice a year, swept just as the dining-room chimney, or cleaned out, as the hot-water high-pressure boiler and the cisterns. But in the latter cases the immediate tangible unpleasant results of neglect are very apparent where, as in drains, the owner gets a certificate from a sanitary expert, carries it in his pocket, and displays it to his friends, or frames it as an ornament for his library, and prepares to live happily and securely as regards this matter for ever after, till something turns up, fever or what not, or even he may want to sell the property. Then there is another examination, and not only has the expert's dogmas much changed, but often the new tests are so severe that all ordinary work gives way before them. But enough of drains. Keep them simple, have as few traps as possible; what you do let it be of the best materials and best workmanship; never cover up till you have been able to satisfy yourself that it is all as perfect as you can make it, and above all give every facility for the air to circulate through the system by cutting the drains up where you get very long lengths; and where you can afford

it arrange a flushing-tank that shall flush out the system at intervals during the twenty-four hours.

Now I am on sanitary matters I would not have you forget that the water supply is equally as important. Have as large a tank-room as possible, and at least one window that will open in it, and double felt the roof to keep out both the heat and the cold. The place I like best for the hot-water circulating cistern is in the bath-room by the ceiling, cased in mahogany, as then it can be opened from the floor of the tank-room above. If you have constant or intermittent supply, I would have two galvanised iron cisterns in the tank-room, one to supply the water-closets and bath, and one the taps over sinks and the hot-water arrangements. If you have constant supply always try and arrange to have it by meter; you will save the extra expense by the fittings, and those abominations the small water waste-preventing cisterns to the water-closets can be done away with. Also I would recommend you to see carefully that the supply is securely fixed to the wall, especially when it delivers over the iron cistern, as, on account of the pressure, it is apt to be forced out of position and get loose, or if it touches the ironwork. Directly it even slightly loosens the fixing it will produce a dreadful buzzing sound, that comes on at all kinds of strange moments and lasts a dreadful time often, especially if the water be very hard, for as you all know, with very hard water after a year or two the best of taps will not work perfectly unless they are seen to and cleaned. I always fix the supply pipe by iron cistern to a 7-inch board firmly fixed to wall, and the pipe secured to board by wooden cleats screwed up tight, with an extra strong cleat immediately over the ball-tap.

Be careful that the valves to cut off supply from the cisterns to house are placed where they can be seen and got at immediately under the cistern, and that each one is properly labelled; and in the kitchen have a special peg, properly labelled with full instructions, to hang the tap on to turn off the water to the rising main. Remember hot-water pipes throw off black rays wherever they touch a wall or ceiling, and unless they are fitted and canvassed, or otherwise covered, they make everything dirty they touch, especially linen in a linen cupboard; and remember, also, felting keeps in the heat, and gives hot water the first thing in the morning. Remember that water-pipes had better be kept well inside the house and well under the ground to protect them from frost; but if the hot-water pipe is put too near the cold supply taps, although not unpleasant in winter it is very much so in summer.

Mr. BERNARD DICKSEE moved a vote of thanks to Mr. Vacher for his paper. He said he did not like valve closets but the wash-down pedestal closet. The trap was visible, and if it were dirty it could be seen. Too large a soil-pipe should not be used. A 3-inch soil-pipe was quite large enough.

Mr. FRANCIS HOOPER seconded the vote. A most economical form of decoration, he said, could be got by the use of joinery. In small houses there should, at any rate, be one large room.

Mr. GOLDSMITH, hon. secretary, considered a window above a fireplace was objectionable. Rooms with long low windows made cheerful living-rooms.

After some remarks from Mr. Greenop, Mr. Hewitt, Mr. W. E. Davis and Mr. M. Garbutt, the President put the vote to the meeting and it was carried by acclamation.

Mr. VACHER briefly replied and the proceedings terminated.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

ON Monday Mr. J. W. Morkill, M.A., read a paper at the meeting of the Leeds and Yorkshire Architectural Society, on "The Knight Templars in England, with Special Reference to their Possessions in Leeds and District." Mr. G. B. Bulmer presided.

Mr. Morkill said the Knight Templars differed from most other monastical orders. They were not only monks, but soldiers. The increase of the order was rapid, its exploits most brilliant, and its miserable downfall made its history most romantic. In the fourth century of the Christian era, the fourth Emperor Constantine built a church, called the church of the Holy Sepulchre. Very many Christians made pilgrimages to it, and it was owing to the extreme persecution of those persons that nine knights banded themselves together to protect them. At first they had no habitation, but afterwards they were given a residence within the precincts of the temple upon Mount Moriah. From that they got their name. The original intention of the body was to protect the poor Christians, but afterwards they undertook to protect Palestine generally and the Eastern Church. Subsequently many of them came to Europe, and established themselves in different places. Their first appearance in England was in 1128, when they became extremely popular, and were granted many immunities. They had seventy-two rules to guide them, which Mr. Morkill

said were suited more for a boarding-school than for a band of soldiers. The Templars fought many battles in Palestine, and by overwhelming numbers were gradually exterminated. Those in France and England were imprisoned and tortured, and finally, in 1312, all who were not killed were liberated, and the order was abolished. The principal habitation of the Templars near Leeds was at Whitkirk. The Templars were given that estate in 1154 or 1155, and also the church there. Whitkirk was the centre of a large district belonging to them, extending on the one hand to Tadcaster and on the other to Ilkley. The Templars lived at the manor of Templenewsam, which was quite distinct from Whitkirk. The manor house at Whitkirk was still in existence, and the Court was now regularly held there. Of the jury who made presentments, some of them were summoned from the neighbourhood of the Leylands, Leeds, which was part of the manor. The present lady of the manor is the Hon. Mrs. Meynell-Ingram. Many of the houses in the district of Leeds referred to were marked by one of the crosses of the order. In Lowerhead Row there were about a dozen crosses, and on the houses in Templar Street were also to be seen this peculiar cross. In the village of Newland, near Normanton, the same crosses were likewise found.

A vote of thanks to the lecturer closed the proceedings.

AMERICAN HOUSES.

A WRITER in the *Greening Star*, in recording that the Forest Glen Estate in Virginia had been sold, offers the following remarks about the character of the houses that are likely to be built on the plots:—

It is a familiar fact to those who have given the subject of domestic architecture the slightest attention, that there is fashion in architectural forms just as there is in the cut of a coat or the shape of a bonnet. Just now houses that pretend to be anything, or in other words that aim to be the vogue, are either fashioned in the forms peculiar to the Romanesque style or present the quaint conceits of the colonial style, or perhaps they show that strange jumble of a number of orders of architecture that is called, for want of a better name, the composite. At any rate, whatever happens to be the rage at the time is the style which the average man elects to have when he contemplates the erection of a house. The point of interest, however, in this connection is one that has not been generally noted, and that is the fact that it makes but little difference what a house is going to cost, it must be in the style. The elegant house costing perhaps 100,000 dols. is repeated in all its essential details in a house costing only 5,000 dols. There is the brown stone, the carved pillars, the towers, the tiled roof, the hard-wood vestibule in the front of the one, and in the other is found the same general features with such differences in the material used and the workmanship employed as the available funds make necessary. The same principle hold good in the interior. The house of moderate cost has all the modern electrical devices which are supposed to contribute to ease of living. If it is the style to have a white and gold parlour that is what the occupant of a cheap house has. He has tiled fireplaces, and a grille over the glass in his front door and a platform staircase, and if he so desires he has a central hall where he can hang the family portraits and introduce the other features of a baronial hall. It is quite evident, in this city at least, that the man of moderate means does not need to build a castle to enjoy what is known as "all modern conveniences," or be in the swim.

Since the fashion has recently been set of having the main entrance to a residence through the back-yard or, to put it more elegantly, through the courtyard in the rear of the house, there has been considerable curiosity expressed as to how this fad will be applied to small houses. It is ridiculous to suppose that only the fortunate owners of corner lots will desire to adopt this style. Therefore the problem of introducing this new fashion will be complicated by the necessity of adapting it to houses in the middle of a row. For example, a man desiring to erect a two or three storey house at a cost of not over five or six thousand dollars concludes that he wants one of these new entrances. As such a house is not apt to be more than 20 feet wide, perhaps not more than 18 feet, taking the space required for a driveway from the lower storey would necessarily oblige an economy in the details. A driveway wide enough to permit the passage of an ordinary carriage ought not to be much less than 6 feet wide. Allowing space for a hallway there would remain not a great width for the furnace-room or dining-room and kitchen, which as a rule occupy the basement storey of a house of this character.

The space devoted to these domestic departments would perhaps appear at first to be slightly cramped, but as an offset the occupant could have the proud satisfaction of knowing that his home was in style. There could be an entrance from the side of this driveway into, for example, the central hall of the house. No doubt a number of ways of adapting this entrance to houses of moderate size will occur to the ingenious architects who will be called on to wrestle with this problem. It is

possible that the driveway will be introduced, and they will not give it the width necessary so that it could be used for carriages, on the supposition that there will be but few visitors who will insist on making calls in a carriage.

ST. MARY'S, OXFORD.

THE controversy over the age and value of the statues belonging to the church of St. Mary the Virgin is not ended, for while the former letters were written without examination of the building, the result of an examination can now be given. In an additional letter the Secretary of the Society for the Protection of Ancient Buildings writes to the *Times*:—

It will interest those of your readers who followed the recent correspondence in the *Times* on the subject of the statues at St. Mary's, Oxford, to know that they have now undergone a careful examination at the hands of two professional members of the Society for the Protection of Ancient Buildings. An exhaustive report has been prepared, which can be seen on application. Its substance is as follows:—Of the twelve statues, ten are ancient, and though they have been patched from time to time, they are on the whole in a remarkable state of preservation. They are monoliths, about 7½ feet high, representing St. Mary the Virgin, St. John the Evangelist, St. Hugh of Lincoln, Edward the Confessor, St. Cuthbert, and five other Bishops. The hands are for the most part new or missing, and in two cases the faces have come away. There are other repairs, especially to the thin folds of drapery. The king alone has some parts of his tunic, &c., made up in Portland cement, which adheres well to the stone. Most of the original masonry is so hardened by time that a penknife will make no impression. In design and execution these figures are second only, among English Medieval sculptures, to those at Wells. In spite of all deficiencies they remain invaluable as works of the highest art. This being so, I cannot believe that the University will consent to their removal.

GENERAL.

Mr. A. J. Butler, M.A., Fellow of Brasenose College and Junior Proctor, has been appointed a curator of the Ashmolean Museum, in the place of Professor Westwood.

A Gold Vase has been bequeathed to the Museum of Amsterdam by Madame Von de Goltz. It was presented to Admiral Ruyter by the States-General. It should be placed near the numerous paintings which represent Ruyter's victories.

The Jurors who, in addition to the academicians and officials, will take part in the selection of the works in connection with the competition for the Grand Prix de Rome, section of architecture, are MM. Moyaux, Mayeux, Paulin, Ullmann, with MM. Guadet and Guillaume as supplementary jurors.

Mr. W. O. Foster, of Apsley Park, has offered to give 1,000*l.* towards the building of a new infirmary at Bridgnorth, and Mr. J. Martin Southwell a plot of land for the site.

Mr. Horace Cheston, we learn, has taken into partnership Mr. J. C. Perkin, who was articulated to Messrs. Paley & Austin, of Lancaster, and who has been with him for over nine years. The name of the firm in the future will be Cheston & Perkin.

A Canopied Reredos designed by Mr. Pearson, R.A., has been presented to Peterborough Cathedral by the family of the late Dr. Saunders, Dean of Peterborough from 1853 to 1878.

Mr. Arthur Vickers, secretary of the Kildare Archaeological Society, has it is stated been appointed Ulster King-of-Arms in succession to the late Sir Bernard Burke.

Mr. H. Higginson, architect, read a paper on "House Decoration" at the last meeting of the Carlisle Architectural, Engineering and Surveying Association.

The Board of Manufactures, Edinburgh, have granted the Society of Scottish Artists the use of the Royal Academy National Galleries for their autumn exhibition this year.

A Roman Catholic Church was opened on Thursday at Kidsgrove. It was designed by Messrs. Sugden & Son, of Leek.

The Sixty-seventh Exhibition of the Royal Scottish Academy was opened for private view on Friday last, and to the general public on Saturday.

The Fine Art Committee of the Leeds Corporation have fixed the private view of the Spring Exhibition of pictures for the 20th inst. The exhibition will remain open till June.

The Seventh Annual Exhibition in connection with the Paisley Art Institute closed on Saturday last. The results have been exceedingly satisfactory.

Mr. George Henry Cox, architect, Birmingham, met with his death on Tuesday, being run over by a train while crossing the Midland Railway near Burnt Green Station.

Mr. A. Swash, of Newport, has obtained the first prize in the competition for laying out eleven acres of the Fields Estate, Newport, for building purposes. Messrs. Veall & Sant, architects, Cardiff, were the assessors.

Mr. George Donaldson, who was vice-president of the Jury of Awards at the last Universal Exhibition in Paris, has obtained admission to the Legion of Honour for services rendered to art in France.

INDEX AND DESCRIPTIONS TO THE ARCHITECTURAL ILLUSTRATION SOCIETY'S PLATES. (SECOND SERIES, 1892.)

NOS. 449-453.—VIEWS OF HANOVER CHAPEL, REGENT STREET, W.
Measured and drawn by Francis Edward Ward. C. R. Cockerell, R.A., architect.

Royal Academy silver medal, 1891.

NOS. 454-459.—VIEWS OF 185 QUEEN'S GATE, W.
R. Norman Shaw, R.A., architect.

NOS. 460, 461.—VIEWS OF THE NEW HOSPITAL FOR WOMEN,
EUSTON ROAD, N.W.

J. M. Brydon, architect. The building is built of stock brick for the general walling, and all the dressings in the way of string-courses, cornices, pilasters, quoins, &c., are in cut and rubbed red brick, and the carving is also in red brick, and the whole of the entrance-porch is also in cut red brickwork. The only exception to this general treatment is in the boundary walls and gate piers, where the moulded work is in Portland stone, as shown in the general view.

NOS. 462, 463.—VIEWS OF 20 JAMES STREET, BUCKINGHAM
GATE, S.W.

Reginald Blomfield, M.A., architect.

NOS. 464, 465.—THE ENTRANCE, MONTACUTE, AND THE SCREEN,
WESTER KERK, ENKHWYZEN.

From drawings by Reginald Blomfield, M.A., architect.

NOS. 466, 467.—VIEWS OF ST. CATHERINE'S, NEAR BATH.

NOS. 468, 469.—THE DOORWAY, FOUNDLING HOSPITAL, CORDOBA,
AND THE CATHEDRAL, GRANADA.

From drawings by Francis W. Bedford.

NO. 470.—THE OLD BANQUETING-HOUSE, KENSINGTON PALACE.

Probably built by Vanbrugh. From a drawing by A. M. Philips. This building stands in Kensington Gardens, a little northward of the Palace. The front is of brown and red brick, with Portland stone dressings, the cornice and Doric entablature being of cement. The interior is richly panelled and decorated with Corinthian columns and entablature. It is now used as a potting-shed for the gardeners, and is in a deplorable state of repair. There is no direct evidence as to who the architect was. It seems probably the work of Nicholas Hawksmoor. The date is 1705.

NO. 471.—ADDITIONS TO GLASGOW UNIVERSITY: GARDEN FRONT.
John Burnet, Son & Campbell, architects.

NO. 472.—BOARD-ROOM, NO. 5 LOMBARD STREET, E.C.

W. Dunn & R. Watson, architects. The walls in the basement of this building were excavated and new offices formed. This board-room is panelled in deal, painted white; the marble jambs of the fireplace opening are in sienna marble. A peculiarity of the room is that it is below the ground level, the light being reflected from a large tile slope on one side.

NOS. 473-476.—VIEWS OF THE MANOR-HOUSE, WANSWORTH.

(Now destroyed.) From photographs by G. E. Martin. This house was built about 1670, by Peter Paggen. It was built of brown brick, with red brick dressings. The cornice and door cases are of wood. The staircase shown in the photographs had the walls and ceiling elaborately painted with figure subjects. The carving of the screen in the hall was exceedingly good. It should be noted that the carved panel on plate No. 473 is printed upside down upon the sheet.

NOS. 477, 478.—THE CHURCH OF ST. SALVI, ALBI, AND THE
CHURCH OF ST. AUSTREMOINE, ISSOIRE.

From drawings by J. A. Slater. This view of the church of St. Salvi, Albi, was taken from the roof of Albi Cathedral. The church represented is built for the greater part of red brick. The church of St. Austremoine, Issoire, is a characteristic specimen of the Romanesque style in the Auvergne. The treatment of the transepts is remarkable, being raised to a sufficient height to support the domed crossing in the tower. The easternmost of the chapels is finished with a square end. As an example of pyramidal design the church, seen from the east, is a fine type. The interior, vaulted, is very interesting, as affording a comparative study to the external effect. Some of the capitals are very interesting; one in the apse notably so, where *The Last Supper* is represented, the table-cloth going completely round the capital with fine decorative effect.

NO. 479.—COMPETITIVE DESIGN FOR THE BATTERSEA INSTITUTE.

R. Watson, architect. This is a design submitted in a limited competition.

NOS. 480, 481.—THE PULPIT, RAVELLO CATHEDRAL, AND THE
BISHOP'S THRONE, RAVELLO CATHEDRAL.

From drawings by J. A. Slater. Ravello is one of the most interesting places in Southern Italy, situated a few miles from Amalfi, in the Gulf of Salerno. Nowhere in South Italy can more beautiful specimens of Byzantine art be met with. The pulpit here represented, in white marble, and inlaid with mosaics, was presented in 1272 to the cathedral, and bears this inscription:—"Nicolaus de Fogia marmorarius hoc opus fecit." The bishop's throne is on the north side of the choir. One remarks with interest the thinness of the inlaid walls to stairs—just slabs of white marble.

NOS. 482-485.—VIEWS OF GEORGE HERIOT'S HOSPITAL,
EDINBURGH.

From measured drawings by R. Shekleton Balfour, silver medallist, Royal Institute of British Architects, 1892. It was founded by George Heriot, court jeweller to James VI. of Scotland and I. of England. He left 23,655*l.* sterling to found and erect a hospital at Edinburgh for educating the sons of certain burgesses. The question as to who the architect was has always given rise to much discussion, though from careful investigations which have been made, it would appear that William Wallace, who was appointed master mason in the year 1628, and William Aytoune, who succeeded him, had the principal share in the designs. The name of Inigo Jones has frequently been mentioned in connection with the work, but no authority can be found to corroborate this. The foundation-stone was laid on July 1, 1628, and the hospital was dedicated in 1659.

NOS. 387, 388.—ELEVATIONS AND PLAN OF A COUNTRY HOUSE,
DORSET.

Ernest George & Peto, architects.

NO. 389.—HOUSE AND STUDIO, PALACE COURT, BAYSWATER, FOR
MR. PERCY MACQUOID.

Ernest George & Peto, architects.

NO. 390.—A GROUP OF COTTAGES AT EATON HASTINGS, BERKS,
FOR MR. ALEXANDER HENDERSON.

Ernest George & Peto, architects.

NO. 391.—DINING-ROOM AND LIBRARY, FOR MR. W. S. SALTING.

Ernest George & Peto, architects.

NO. 390.—INN AT FORTINGALL, PERTHSHIRE.

W. Dunn & R. Watson, architects. This is an addition almost amounting to a rebuilding of an existing inn. The walls are of stone, covered with rough cast, and as the only stone fit for moulded work has to be brought from a distance, very little moulding is used, the building, like the rest in the neighbourhood, being very plain.

NO. 391.—CHURCHCROFT, PUTTENHAM, NEAR GUILDFORD.

Halsey Ricardo, architect.

NO. 392.—HOUSE AT HAMPSTEAD.

E. J. May, architect.

NO. 393.—HOUSE IN CONNECTICUT, U.S.A.

E. J. May, architect.

NOS. 394, 395.—GEORGE HERIOT'S HOSPITAL, EDINBURGH.

From measured drawings by R. Shekleton Balfour, silver medallist, Royal Institute of British Architects, 1892. (See description, Nos. 482-485, *ante*.)

NO. 396.—ST. PETER'S COLLEGE, RADLEY: NEW CLOISTER AND
PROPOSED NEW CHAPEL AND HALL.

T. G. Jackson, A.R.A., architect. Radley College having lately become the freehold of the trustees, they are now gradually replacing by permanent structures the temporary buildings of timber and iron originally put up while the estate was only held on lease. They have lately built a sanatorium and new cloisters with studies and other rooms above, from the designs of Mr. T. G. Jackson, which are shown in the illustration. The completion of his design by a new chapel and hall is intended to follow shortly.

NOS. 397, 398.—VIEWS OF THE LIBRARY, LINCOLN CATHEDRAL.
Sir Christopher Wren, architect.

NO. 399.—GLENLYON HOUSE.

W. Dunn & R. Watson, architects. This is an alteration and addition to Glenlyon House, an old historic house at the entrance to Glenlyon. The walls are of stone, rough cast; the

roof is covered with a very fine thick slab, locally procured. The drawing-room of the first-floor in the south wing is a long room with a ribbed plaster ceiling. The entrance-hall is panelled in deal.

NO. 400.—CHURCH OF ST. MARY, BOTTESFORD: NEW ORGAN.
Gerald C. Horsley, architect.

NO. 401.—THE REGISTER OFFICE, EDINBURGH.
Robert Adam, architect. Built about 1771.

NO. 402.—THE ATLAS ASSURANCE COMPANY'S OFFICES,
CHEAPSIDE.
The late Mr. Thomas Hopper, architect.

NOS. 403, 404.—THE SECTION AND PLAN OF FIRST FLOOR OF
THE REGISTER OFFICE, EDINBURGH.
Robert Adam, architect. Built about 1771.

NOS. 405, 406.—THE INTERIOR OF A CHURCH, TOSCANELLA, AND
ST. CATHERINE, RAVELLO.

From drawings by J. A. Slater. The church at Toscanella, at some distance from the town, dedicated to St. Peter, is a most interesting example of Mediæval art, and with the church of St. Maria would make a splendid subject for any student who could spare three months for studying them completely, with the end in view, perhaps, of a monograph. Neither of them are used any longer for religious services. St. Catherine, Ravello, is a ruined church by a rocky path.

NOS. 407, 408.—HOUSES AT PALACE COURT, BAYSWATER, W.

The late Mr. J. M. MacLaren, architect. The first sketches for these houses were made by Mr. J. M. MacLaren. The work was completed by W. Dunn & R. Watson. The staircases of both houses are panelled in deal to the first floor, and there are elaborate plaster ceilings in the dining and drawing-rooms.

NOS. 409-412.—VIEWS OF WELL COURT (WORKMEN'S HOUSES
AND CLUB ROOM), EDINBURGH.
Sydney Mitchell, architect.

NO. 413.—THE SEDILIA, BRISTOL CATHEDRAL.

From a drawing by J. A. Slater. It is on the south side of choir. One notes with interest the small figures in intersecting O. G. arches, under vaulted canopies, with dark space behind.

NO. 414.—THE SOUTH DOOR, HADDISCOE CHURCH.
From a drawing by Sydney Tugwell.

NOS. 415, 416.—VIEWS OF THE RIVER HOUSE, TITE STREET,
CHELSEA.
Messrs. Bodley & Garner, architects.

NOS. 417, 418.—GEORGE HERIOT'S HOSPITAL, EDINBURGH.

From measured drawings by R. Shekleton Balfour, silver medallist, Royal Institute of British Architects, 1892. (For description, see Nos. 482-485, *ante*.)

NO. 419.—STATUE OF BARTOLOMEO COLLEONI, VENICE.
Andrea Verocchio.

NO. 420.—HUNTING LODGE, NEAR MALMESBURY, WILTS.
H. Wilson, architect.

NO. 421.—PASTORAL STAFF FOR THE BISHOP OF ST. ASAPH.
The late John D. Sedding, architect.

NO. 422.—ALTAR CROSS FOR PRIVATE CHAPEL, WELBECK ABBEY
H. Wilson, architect.

NOS. 423, 424.—VIEWS OF SCUOLA DI SAN ROCCA, VENICE.
Scarpagnino, architect.

NOS. 425, 426.—VIEWS OF TRINITY GROUND, MILE END ROAD,
LONDON.

NOS. 427-432.—VIEWS OF THE NEW ROMAN CATHOLIC CHURCH
OF THE HOLY ROOD, WATFORD.
John F. Bentley, architect.

NOS. 433, 434.—VIEWS OF TRINITY GROUND, MILE END ROAD,
LONDON.

NOS. 435-438.—VIEWS OF THE ETON MISSION CHURCH,
HACKNEY WICK.

Messrs. Bodley & Garner, architects. The Eton Mission Church is an example of a town church of simple character. The design is one of some originality. The width is considerable, though the aisles are quite narrow and subordinate to the centre portion. The piers are simply square on plan, and the arches and windows have little or no mouldings, except splays. The east end externally is the chief feature. It rises from the pavement of the street. The lower part has an ambulatory, with small traceried windows, and above a large window, placed high up. In the gable there is a carved crucifix with SS. Mary and John. The choir is formed by high screens. They are painted a dark red, but as yet lack their contemplated decoration of gilding, &c. The roofs are painted simply, so that they can be enriched at a future time. The choir fittings are not yet done, funds being insufficient for them. The

foundations had to be very costly. In parts 20 feet had to be excavated before a sufficiently firm foundation was found, for the site is on the edge of the marshland. There is a side chapel, also with a painted roof, which is broadly and simply treated. The whole effect is that of an old town church of almost severe character, though it is not in any way a copy of old work. Effect has been obtained rather by proportion and general character than by any enrichment of detail.

NOS. 439, 440.—WYCHEN CASTLE AND THE MUSIC SCHOOL,
NYMEGEN, HOLLAND.

From drawings by Reginald Blomfield, M.A., architect.

NOS. 441, 442.—DESIGN FOR TOP-LIGHTED CHURCH, NEAR
VICTORIA STREET, WESTMINSTER.
John Belcher, architect.

NOS. 443, 444.—LECTERN, WELLS CATHEDRAL, AND OLD CHEST
WELLS.

NOS. 445, 446.—NEW CHURCH, MILES PLATTING, MANCHESTER.

Leonard Stokes, architect. This church, which the Norbertine Canons are about to build in the poor and populous district of Manchester known as Miles Plating, is designed to accommodate about 1,200 worshippers, and is so planned that the greater number of these can see the high altar. The work has not yet been begun on account of lack of funds; but it is proposed to build the church almost entirely of the local bricks, stone, however, being used for the nave piers, arches, vaulting ribs, &c. As the church is to be specially dedicated to the Blessed Sacrament, any richness in the design has been massed round the high altar, the nave depending upon its size and simple dignity for effect.

NOS. 447, 448.—CAPITAL IN NAVE, MONREALE CATHEDRAL,
AND AMBO IN THE CATHEDRAL, RAVELLO.

From drawings by J. A. Slater. The capital in nave of Monreale Cathedral is of white marble, resting on a grey granite column, and carrying cushioned abacus, and arch covered with mosaic. White marble ambo on north side of nave, Ravello Cathedral. Representations of Jonah in mosaic; steps ascend from either end of platform, semicircular wall towards nave, fronted by eagle bearing book-rest. The two discs on left are in porphyry. It would be difficult to find a design in which simple lines have resulted in a more dignified composition.

NOS. 449-451.—VIEWS OF FOX OAK, BURHILL, NEAR WEYBRIDGE.
Halsey Ricardo, architect.

NOS. 452, 453.—CHURCH OF ST. MARIA DI CASTELLO, CORNETO,
AND A CHURCH AT CORNETO.

From drawings by J. A. Slater. The church of St. Maria di Castello, Corneto. This is the west front of an exceedingly interesting church. The tower that appears in the view is one of several in the town, which give it a remarkable appearance when seen from a distance. The capitals to the nave arcade and vaulting shafts are in porphyry, telling as "darks" against the rest of the light stonework; steps of font inlaid with marble mosaic.

NOS. 454, 455.—ST. PAUL'S CATHEDRAL: SOUTH SIDE OF CHOIR
STALLS AND DETAILS FROM CHOIR STALLS.

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427, 432	Bentley, John F.
462-465, 439, 440	Blomfield, Reginald
415, 416, 435-438	Bodley & Garner, Messrs.
460, 461	Brydon, J. M.
471	Burnet, John, Son, & Campbell
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472, 390, 399	Dunn, W., & Watson, R.
387-391	Ernest George & Peto.
402	Hopper, the late Mr. Thomas
400	Horsley, Gerald C.
396	Jackson, T. G., A.R.A.
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445, 446	Stokes, Leonard
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448-453	Ward, Francis Edward
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420, 422	Wilson, H.
397, 398	Wren, Sir Christopher

The Architect.

THE WEEK.

THE great event of the week, at least for British politicians, is, like most mundane things, not unrelated to architecture. If, as so many desire, the number of members of Parliament could be diminished one-seventh, then we should have fewer complaints about the inadequacy of BARRY'S House of Commons. That seating accommodation can be insured in it for 640 members is undeniable, but the conditions are not favourable either for comfort or the despatch of business. When the programme of the Houses of Parliament was prepared for the competitors it was supposed that so many members would not attend as have been seen of late years. The accommodation, therefore, is barely equal to the demand on it, and a migration elsewhere would not be regretted by the officials of the House. It is remarkable that at the beginning of the century, as at its close, the House of Commons was found to be too small. The ancient chamber, in which it was said that members, with their backs to the fire, ruled the world, had to be enlarged, in order to make room for the legislators who were evicted from College Green in Dublin. In the course of the operations some ancient paintings were discovered on the walls of St. Stephen's Chapel. The subject of one of them was not clear, and the aid of the Society of Antiquaries was invoked. It was declared to be a representation of JOB and his family. But the conclusion was supposed by some to be only an indication of the fate of the Speaker. There is no doubt that the Chair has been a capital place for anyone who wished to imitate the patriarch in the exercise of patience.

IN 1891 two painted medallions were discovered on the wall of a house in Pompeii. The subjects were young men, their heads being crowned with laurel. One was clad in a white, the other in a dark, toga. A scroll was introduced near each bust. On one "Homer" was discerned. Professor SOGLIANO believed he was able to read "Sappho" on the companion scroll. It was concluded that the medallions were portraits of VIRGIL and HORACE. But what conclusion in archæology is accepted without opposition? At the meeting of the German Archæological Institute which was held a few days ago in Rome, Dr. MAU brought forward a new theory. He maintains that what is inscribed on one of the scrolls is not "Sappho," but "Plato." The medallions, according to him, are not portraits, but ideal paintings of two literary students, who were supposed to be engaged on the great representatives of poetry and philosophy. They are none the less valuable as examples of decorative painting.

THE Wednesday lectures at Carpenters' Hall will begin next week, when Professor J. M. THOMSON will speak upon the "Chemistry of Building Materials, Pigments and Protective Agents." On the succeeding Wednesday the following lectures will be given, viz. "Electric Lighting," by Professor SYLVANUS THOMPSON; "The Italian Renaissance, as exemplified in St. Peter's, Rome, in Florence and Venice," by Professor BANISTER FLETCHER; "The Early Renaissance in England," by Mr. J. A. GOTCH; "The Later Renaissance in England," by Professor T. ROGER SMITH; "The Tower Bridge," by Mr. J. WOLFE BARRY. The report by Mr. LLEWELLYN SMITH to the London County Council renders justice to the efforts which are being made by the Carpenters' Company in promotion of technical education. It records that 500*l.* a year has been contributed to the City and Guilds Institute, and a donation of 1,500*l.* towards its equipment. The company in 1886 built an institute at Stratford, at which various technological subjects, chiefly bearing on the building trades, are taught. Last year the company opened day-classes in the same building, and are now making it into an organised science school. The capital and annual outlay on the Institute since its commencement has been 12,915*l.* A free technical library has been opened in Carpenters' Hall; a trade wood-carving school in connection with the Institute of British Wood-Carvers, in Chapel Street, Bedford Row; and an

amateur school at King's College. Aid has been given towards the teaching of subjects connected with the professorships of architecture at King's and University Colleges, and the use of rooms in the Carpenters' Hall is allowed to various societies connected with the building trades. Independent of donations and subscriptions to the City and Guilds Institute, the total cost of the company's educational work in the last eight years has been upwards of 18,000*l.*, and further plans for the promotion of technical education are now being considered.

THE following are the questions to which the inspectors of schools in England will have to send replies after the annual visits, which begin this month:—"Site—(1) Is it open and airy? (2) Does it provide about a quarter of an acre for every 250 children accommodated? Playground—(1) Is it of sufficient size? (2) Is it provided with gymnastic apparatus? Building—(1) Is it, as regards general plan, convenient and suitable? (2) Is it dry? (3) Is it in good repair? (4) Is it well built of stone or brick? (Stone walls should be at least 20, and brick walls at least 14 inches thick.) (5) Are the rooms of reasonable height? (6) (a) Is it light in all parts? (b) Is the light so admitted as not to incommode teachers or children when at work? (7) Is it well warmed and free from draughts? (8) Is it well ventilated? (Rooms with open roofs should have apex ventilation, and a ceiled room should have windows opening to the ceiling.) 9. Are any class-rooms passage rooms, or below the size of 18 by 15 feet? 10. Are the staircases and entrances convenient and separate for each department, and sufficient for clearing the school quickly? 11. Are there cloak-rooms? And, if so, are they distinct from the school-room and class-rooms, and are they sufficient? 12. Are the closets and urinals light, sanitary, sufficient, well disconnected from the school, and separately approached by each sex from the schoolroom itself? 13. If there is any infant class, is it taught in a separate class-room? Apparatus, &c.—Is the school well equipped in respect of (a) furniture, (b) apparatus, and (c) books? Does the school provide the accommodation allowed to it in the Blue Book, if adequate accommodation at desks and benches is taken into account?" It will be evident that no extravagant conditions are expected to be realised by the managers, although the circular of the Education Department has caused some dissatisfaction.

LAUNCESTON CASTLE and Launceston Priory are so connected with the history of England as to be matters of more than ordinary interest. The castle was completed by WILLIAM THE CONQUEROR, and the priory was founded in the reign of his son, HENRY I., A.D. 1126. Within 200 years of its foundation the priory became a stately monastic building, and, at the end of another 200 years, it was the wealthiest priory in Cornwall. It had probably sheltered its benefactors, the son of King JOHN, RICHARD, Earl of Cornwall and Poitou, and EDWARD the Black Prince, as well as other illustrious earls of the county. At the general dissolution of English monasteries (A.D. 1536-39) Launceston Priory shared the common fate. It was levelled to the ground. Its walls, its piers and arches were thrown down and either removed to distant places or buried in rubbish. The site of the building was afterwards used for depositing waste and rejected matter of all kinds, until at length its actual locality was unknown. After the lapse of 350 years an attempt has now been made to discover the ruins, and happily some of them have been revealed. By the courtesy of Mr. TROOD, the owner of part of the Priory meadow, some general explorations have been made by the Launceston Scientific and Historical Society. Bases of piers, portions of arches, fragments of tombs and tiles, and foundations of walls have been found. Mr. TROOD now offers to sell to the Society, for the public, about a quarter of an acre of the most important part of the site. It is believed that access will be obtained to this part through the adjoining churchyard of St. Thomas the Apostle. It is beyond all doubt desirable to accept the offer. The land with its interesting contents can be secured and excavated and fenced for permanent preservation at a cost of about 130*l.* The committee of the Society ask immediate public aid towards these objects. Subscriptions will be received by Mr. OTHO B. PETER, Launceston.

THE FUTURE OF SCULPTURE.

WHEN BENJAMIN WEST, P.R.A., was asked about the value of the Elgin Marbles, he said:—"I think them of the highest importance in art that ever presented itself in this country, not only for instruction in professional studies, but also to inform the public mind on what is dignified in art." Over seventy years have passed since that evidence was given, and would any impartial witness have the courage to say that our sculptors are more able or the public more enlightened about sculpture than in the days when the frieze, metopes and pedimental figures were still in their positions in the Parthenon? Must we not acknowledge that the educational influence of the sculpture has been of little account? It was brought with the best intentions from Athens, and the House of Commons, in voting a large sum of money, was hopeful that the pieces would be turned to account by artists; but all who took part in the transaction were at the time under a sort of delusion, from which, unfortunately, we are not yet free.

We are so successful in this country in utilising the most obdurate materials in manufactures, it is easy to imagine that there is a process for making artists and lovers of art. One element in it is a collection of pictures and statues. We are so convinced of the influence which can be exercised by such works that we do not make any provision for explaining them. Because RAPHAEL'S mind was supposed to have acquired new powers by merely looking at the paintings in the Sistine Chapel, it was supposed that it was only necessary to deposit marbles in Bloomsbury and paintings in Trafalgar Square in order to convert sightseers into Greeks and Italians. There was nobody to inquire whether the sculpture and the pictures in any way corresponded with the needs of the British mind. The works were put there at great cost, and it was considered to be the business of the public to become transformed.

At present we have to deal only with the sculpture, and we have no hesitation in maintaining that the Parthenon treasures have not accomplished a revolution among us. The figures have given rise to a good deal of speculation, but that was not the aim of Parliament in granting the purchase-money. They were expected to acclimatise the Classic style in England, and we are not more attracted towards it than the Englishmen who lived a century ago. To one class of critics, and to most sculptors, this indifference is culpable; but we may ask, does it not arise from our being unlike the Greeks in our condition of life and our manner of thinking? If so, destiny should bear the blame for the change.

In the first place, it may be admitted that we do not get up a taste for sculpture in the same way as the Greeks. They did not employ foreign works for models. The art was native, and grew from a humble beginning. They did not presume to expect that all that was necessary was to import the finest examples and to begin with rivalling them. They were more humble, and made sure of one stage before they advanced to a higher. The people progressed with the artists. The subjects were always familiar to them. As there was a respect for types ordinary men were not puzzled by novel treatment. License would not be tolerated. There was a sort of unwritten code which prescribed limits, and the most imaginative sculptor would hesitate before he attempted an innovation. PERICLES suffered because PHIDIAS introduced a portrait of him as a testimony of friendship. How unlike is our practice. A modern sculptor would be condemned if one of his figures recalled another by himself or by a different artist.

Then, again, there was a homeliness about the most exalted figures of the Greeks which is incomprehensible to us. Every man may not have supposed that the gods and goddesses were impersonations of natural phenomena. The dwellers in Olympus rather appeared as beings who had all the good and bad qualities of the Greeks. Absolute perfection was not claimed for one of them. Their foibles made them akin to mortals. Statues of the divinities therefore to a Greek represented beings that might be said to be familiar to everybody. We consider that figures of characters created by SHAKESPEARE or SCOTT would excite about as much awe in a modern exhibition as did statues of the Olympians in a Greek town. We must not confound

our notions of reverence for the unseen with that which was found in Greece.

There was another reason for the existence of sculpture representing god-like beings, which we cannot well appreciate. With the Greeks there was a sort of mystical importance attached to beauty. It was honoured as a divine gift. Handsome and shapely youths were in some places considered to be the only mortals that were eligible for priests or assistants in religious ceremonies. Elsewhere or in similar ceremonies beautiful women were employed, and probably those who were represented in the frieze of the Parthenon were not much idealised. We cannot imagine how PHRYNE'S rising from the sea could be a part of a religious ceremony, for in no European watering-place would such an exhibition be tolerated; but the Athenians were able to regard it with reverence. The difference in ethics between past and present in regard to that incident by itself suggests that in modern times we can never admire sculpture under similar aspects with the Greeks. We have lost the old associations which made the figures as it were eloquent to all. Now they are simply combinations of lines and contours, which have so little meaning for us that we might put the Panathenaic frieze around a church without any fear that it would do more to paganise the worshippers than the caryatids of the Erechtheum which have been so long set up at St. Pancras, without affecting the orthodoxy of the congregation. The conventional ornament is not more harmless.

In whatever way it is considered, Greek sculpture will be found to be a production of men to whom the art was not what it is to us. As a consequence it may be said to be inimitable. During the whole of our era there was no greater sculptor than MICHEL ANGELO; but where is the work by him which has the Greek spirit? His figures of *Moses*, *Dawn*, *Night*, and *Julien de Medici* are most vigorous, and might have been wrought by the hand of a giant; but they are inspired by thoughts which would be incomprehensible to a Greek. The value of his productions is not lessened because they are not imitations of earlier work, and if MICHEL ANGELO could have had the whole of the Parthenon marbles before him, they would not be advantageous if he lost any of his individuality. Yet after all, can it be said that with all his genius MICHEL ANGELO'S works produced effects among his contemporaries or the people of a later age, which recalled the enthusiasm that arose in Greece? Is it not evident from the records that in his day sculpture did not take so strong a hold on the multitude as painting? The meaning of the colossal figures in San Lorenzo was as doubtful in the sixteenth century as they are in the nineteenth. The great artist believed in allegory, and he may have imagined that all who gazed on his figures would be competent to realise the thoughts which he wished to express under forms that were visible. But the world has grown too busy to spend time on puzzles of that kind, and MICHEL ANGELO'S figures are now treated as if they were only efforts of an ordinary sculptor who was ambitious to display his knowledge of the figure and was ready to sacrifice beauty to vanity. Can we expect that the groups which ALFRED STEVENS introduced in his Wellington Monument will escape a similar fate? There is no question of their power, but however well they are seen in St. Paul's they are likely to be "caviare to the general." It would need a discourse to explain their meaning and appropriateness. When that sort of preparation is requisite there is not much chance that the emotions will be stirred. Put the monument in the most public place of London, and it would not move the blood of a recruit.

The Germans, who know more about psychological mysteries than any people in Europe, do not seek after obscurities in the sculpture which is to be a memorial of their great men. The work of RAUCH in Berlin, which recalls FREDERICK THE GREAT and his time, has as little symbolism about it as an army list. There is the king, with his sharp, unheroic face beneath his commonplace, well-worn, three-cornered hat, and mounted on a trained and serviceable horse that does not stand on its hind legs. There, too, are the marshals and generals who carried out his plans, as well as the civilians who found encouragement from the warrior. Not one of the figures is idealised; they might all be taken from the life. Is not such treatment

preferable as more in relation with manliness than embodiments of courage and truth in female forms? We have never observed man or youth stirred by STEVENS's beautiful work, but we have often witnessed the spontaneous enthusiasm of young German soldiers when they marched by the memorial of Father FRITZ. In sculpture, as in other things, truth is far more effective than fiction. That truth, however, is no easy attainment will be plain to anyone who will compare a photograph of RAUCH's work with the vulgar figures that stand forth as types of the British army on the plain opposite Apsley House.

It is often lamented that in England there is not much patronage for sculpture. As long as the artists endeavour to force upon the public representations of things which centuries back ceased to have interest, they cannot expect that any sacrifices will be made to secure their works. English sculpture is not in touch with modern ideas, and if its production were suspended for years there would be few to regret the change. It must descend from its sham Olympus if the art is to come home to men's bosoms. Vigour, simplicity and truth are needed. Because they can confer ancient names on their works our sculptors imagine they are the successors of the Greeks, although such works as theirs would not be tolerated in any of the purlieus of Athens. There is no doubt that the use of marble has much to do with the delusion which fills so many inferior sculptors with pride, just as rhymesters imagine they are poets when they find they can have their verses printed on superfine paper. It allows, too, of mechanical production and division of labour through which a sculptor's studio becomes a factory. The public are aware of the processes for producing statues, and they know that it is often difficult to point to any part of a costly figure which can be said to be the sculptor's handiwork. Is it any wonder there is so much hesitation about the purchase of statuary?

It would be an advantage on many accounts if the majority of English sculptors were restricted for a time to terra-cotta. That material is not adapted for figures that are more remarkable for prettiness than vigour. It would aid in the production of a robust style. We might expect that by means of it modern subjects they would receive more attention than they do now, for with all the shortcomings of our age it is as fruitful for the sculptor as the painter has found it. The public would also have the satisfaction of feeling that they obtained the genuine work of the sculptor instead of his assistants. After a course of terra-cotta, more expensive materials might then be utilised with better chance of success than seems to be likely under the existing conditions, which, unhappily, combine to make of sculpture a sort of art that cannot be taken seriously by artists or patrons.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Association was held on Friday evening, Mr. H. O. Cresswell, president, in the chair.

Mr. H. F. Waring and Mr. T. H. Bell were elected members.

It was announced that the Clothworkers' Company had made a present of 50*l.* to the general fund. A vote of thanks, coupled with the name of Mr. Wyatt Papworth, was passed to the Clothworkers' Company for their gift.

Mr. C. J. TAIT, of Exeter, then read the following paper on

The Value of Criticism.

It is at least ten years, longer than I care to say, since it was my privilege as a student to form part of an audience at the fortnightly lectures of this Association. The completion of a decade is a personal matter of some importance, but viewed more broadly, such a lapse of time is insignificant, for we remember the magnitude of the quest upon which we are all bound. Thus it certainly does not warrant my appearance before you as seer or prophet; and indeed I venture to think that this is hardly demanded by an association of students. I will therefore ask you to listen to me as a fellow student, who a little older perhaps than many of you, ventures to address you upon a matter which must be a subject of importance to us all, and especially during those years which immediately succeed that period of training for which this Association was formed. It was said of the Sophists that they believed themselves to be imparting education, whereas they were only imparting results, and the same is true in a greater or

less degree of all elementary teaching. Early years of training must be largely occupied in acquiring fact and information, and that at second-hand. And this means is very valuable. It is a speedy method of finding out what we do and what we do not want to learn. To this end the teaching of the Association has been greatly enlarged since my time. A feast of endless courses has been provided, and my advice to you would be to systematically try them all. Your several powers of digestion will soon reveal to you your capacities of assimilation, and it is when this knowledge comes to you that the true period of education—the leading out of what is within you—commences. For at this point a new and important factor comes into operation, namely, the colouring of your knowledge by your own particular individuality. So long as you are conscious of learning only what must or should be acquired, there is no response from the living, sensuous side of your nature. But when you have discovered what those studies and pursuits are that train and excite a way of regarding things peculiar to your nature or kindred natures, you are entering upon that critical state which will thenceforth dictate the appreciations and depreciations of your life. What we mean by criticism, then, is the expression of a judgment formed by the union of knowledge and self; knowledge alone constitutes a mere inventory, and self alone evokes but an expression of opinion.

For this process of thought, the union of knowledge with self, the Greeks had a name that is more expressive than any exacting definition—imaginative reason. Such a state you will find may be reinforced by all manner of knowledge and experience, for the individual quality forms the necessary link between things that are by themselves unrelated. And this relative knowledge is of the utmost value, for it is reliable when specific information is not available. It is like good money, which will pass current in all countries, irrespective of nationality, while it further permits you to approach, a subject from many different sides, a power, if I may put it so, which enables you to model thought rather than depict it in a linear manner from one point of view only. How we shall train and direct this imaginative reason is surely a question of the utmost importance, for if our natural temperament, which we have elected dictator, love well but not too wisely, we may readily fall into bad habits and acquire a fatal moral or intellectual squint. This question Matthew Arnold has answered so truly and so shortly that I will ask you to accept his advice. We are to know the best that has been done in the world if we would be critics.

It is clear, I think, from what I have said, that I do not propose speaking of the professional critic, of whom it has been written that he will be chiefly remembered by what he has failed to understand. The intelligent craftsman who writes for the limited sphere of his own craft belongs to a remnant insufficient for the general salvation. It was Mr. Toots who spent so much of his time in writing letters to himself, and it is the public who addresses the public in that class of literature upon which the general taste is formed. The interpretative power must be in ourselves and ready to hand. We must each one of us know the best that has been done, and to know this best for two reasons, that it may correct a wrong estimate of the importance of ideas, and also create a current of ideas that are true and fresh. This high standard upon which we are to model our judgment is of especial value, since it saves our self from merging into mere egotism. By it we are brought rather into agreement with our fellows than into antagonism, for most things contain something of the best which renders them worthy. A dewdrop may appear insignificant to us until we remember that it is fashioned by the same laws that form the spheres.

Let us now look back upon architecture, that for our guidance we may regard the best that has been done. And we shall find in doing so that just as criticism is a union of knowledge with self, so architecture, and indeed all creative work, is a union of self with some quality or other. In this way the subject of inquiry and the method of inquiry will often help to explain each other. By knowledge I do not mean information alone derived from books. The Greeks, who have given us our modern ideas, had no books, and deprecated all written thought, since it limited those powers of expression which conversation gave such opportunities to. They rather perceived fact, as some blind folk are said to be aware of a blank wall before them without touching it. We shall see, I think, in the outset that architecture divides itself into two groups, to take a proper estimate of which an important claim is at once made upon our critical faculty, viz. the capacity to differentiate between the communicable and the incommunicable. Many types of art of which Greek art is the completion have reached the forms they present to us by gradual evolution.

The original germ of these forms is known, just as the derivations of a language are known, and by tacit consent these forms have been accepted universally as the fit expression of certain universal ideas. These forms are, therefore, capable of interpretation—communicable just as a language is. On the other hand, that style of architecture which succeeded the

Greek, viz. Gothic architecture, is largely incommunicable; the spirit of it is entirely so by reason of its forms and characteristics not being the result of a general consent; but, on the contrary, the will of the individual artist predominates. It has, for instance, been pointed out how dangerous a model Shakespeare is to the young poet by reason of the personality which pervades and colours his style. The same may be said of all the finest art of the Mediæval and Middle Ages. It will be my purpose now to provide some material towards the building up of these two great types, from which each one of us may fashion as he will what to him befits the immortal.

To ideas which are communicable I give the name of metaphysics, and the incommunicable I call caprice; and it is out of the strange and wonderful admixture of these elements that architecture is born. "The best physician is also a philosopher," said a wise man; and Mr. Ruskin has lately told us that the best architect is also a metaphysician. Now, what are metaphysics? We will take as an instance what Professor Huxley calls the metaphysics of sensation. He describes how we perceive a rose to be scented by reason of certain particles of the flower impinging upon a sensitive organ. The effect is translated along the nerve fibres until it reaches the sensorium, that portion of the brain which is related to the excited nerve. This operation, as far as the sensitive organ is physical, belongs to physics, and its action can be demonstrated; beyond this point the operation belongs, he declares, to metaphysics, and its character is not capable of demonstration. One knows the result, and that is all. It is the same with the point in question. The applications of certain natural and physical laws are devoted to the development of certain architectural results. The nature of the forces employed is known and can be demonstrated. How and at what stage they cease to be forces and become architecture, and yield us pleasure, as the scent of a rose yields us pleasure, cannot be demonstrated. Yet these forces and their architectural resultant are clearly so nearly related to each other, that we may learn much about the latter by an understanding of the physical laws at work, and that physical condition, which is of first importance, and shows itself throughout the whole of Greek art, is rhythm. We find this element not alone in ornament, as set forth in beads, recurring rosettes, and such like examples which are common to all decorative epochs, but we also recognise it as the keynote of all Greek masterpieces. The drama, for instance, is derived from the rhythmic dance, performed at such seasons of the year as were important in the lives of vine plants, when, at the feast of Dionysos, a chorus of fluting dancers was headed by the wine god. To this dance came to be added a dialogue between the god and the leader of the chorus, and so by the introduction of further dialogue did the drama grow. But the rhythmic element was never absent. The verse is now leaping, now flowing like a stream, and now caught up by the chorus and whipped into a tempest of passion as the dancers swayed their procession through the orchestra.

In sculpture it is the same. An early frieze shows us processions of identical figures or beasts which are rhythmical by reason of their repetition. Then the action becomes more complicated, and pause and motion succeed and interweave with each other, its effect becoming heightened by its intricacy.

In the later drama, the exigencies of plot shrouded much of this constructive element, as in later sculpture the ethic school gave way to the pathetic, and the breadth of the grand style became lost amid pictorial effect, but in the best time of both the drama and sculpture the architectonic of each was of prime importance.

In these fields did rhythm manifest itself with a greater ease than was displayed by architecture of a similar period. Architecture is a fugue upon forces, and these forces had to be overcome or assimilated before a kindred freedom could declare itself.

Rhythm, I need not tell you, is an ever-present phenomenon of nature. No force acts continuously, but in leaps and bounds. You will be conscious of this when you put a stick in a running stream, and the stick beats in your hand. Our own organism is dual and not singular, while physiologists will tell you that our nerve force proceeds in jumps, and is not continuous. This property of forces at once presented a decorative aspect to the Greek mind, and was expressed in their architecture by the play of action and reaction. Thus, to have so disposed the weight in their buildings as to dissipate a portion of the thrust laterally, as by a flying buttress, would have been a violation of this rhythmic sense. It is fully evident that the arch was at their disposal had they chosen to adopt it, but its use must have broken this cherished beat in their buildings. Ornament is regularly recurrent, and it is never sought to vary its monotony. This restrictive faculty is unquestionably limiting to imaginative purpose, and the Gothic builders, feeling this, varied the detail of their repeating ornament, and produced a harmony of forces by interweaving their thrusts. Harmonies of this kind the Greeks never aimed at. It necessitated a want of due balance in one direction or another, abhorrent to their sense of measure. Their conception of ordered motion was

that of a star revolving round a sun, and not the course of a comet, which approaches from and disappears into space. Such an apparent dissipation of energy would have been an æsthetic blunder. Concessions to truth which later ages have been willing to make is aptly illustrated by musical tones, which in the Greek scale were in true and perfect intervals, but which for the purpose of obtaining harmonies—that is, the striking of two notes together without discord—have been artificially rendered imperfect in their interval.

While all architecture is, as I say, a fugue upon forces, Greek architecture is pre-eminently a fugue upon the conservation of force, in the working out of which proportion and symmetry are evolved.

Proportion is simply another aspect of rhythm; it is the relation that one mass bears to another. If the attraction of one prove too great in a building, then that building is out of proportion, or since the area upon which the building stands forms one of the masses to be taken into account, if this area be overloaded or underloaded, the rhythmic reaction is inaccurate, and the whole block conveys a sense of disproportion.

Any building crowded round by houses is thus always at a disadvantage proportionately, for you are unable to appreciate the area upon which it stands. Symmetry is but rhythm marshalled into order, and the rhythm of parts arranged towards the production of a total effect. A crystal or a flower are very evident examples. The relation of the entablature to the columns is proportion, that is, the weight carried to the reacting support. The relation of a number of such instances as they together form a whole becomes symmetry, the final step. These effects produce the typical Classical temple style, and it is to these that the sculptor adds, if sculpture be employed, a fresh element in bias. Proportion and symmetry complete an arrangement of forces at rest. Bias or direction belongs to forces in motion, yet still in equilibrium. It is surplus force, and we see its action in the movement of a star when it moves round a sun by reason of the surplus force which it evolves. It shows itself in a subtle, if unpronounced way, in the profile of mouldings and in the ornaments painted or carved upon them. The cyma is a moulding leaping in its form, and is typically the crowning line of a structure. It is as vigorous as some flamboyant poppyhead cresting, allowance being made for the fact that its function is horizontal as well as vertical.

The echinus, which exactly resembles a claw, possesses the gripping and supporting outline, and there is no sense of dissipation marked in its profile as in that of the cyma, but rather the force expressed in its outline returns upon itself.

The ornament, again, which is painted upon the cyma, is the upward clustering honeysuckle, while that upon the echinus is the egg and dart which graphically explains the feeling of the moulding. These are plays of detail which impart freedom within the strict limits of architectural line, but it is in the sculptural frieze and pediments that a more unreserved freedom is to be sought. Yet it is not the freedom of caprice. Its laws are very definite; indeed the sculptor could not have dared the flights he essayed had he not thoroughly known his limitations. In the Parthenon frieze we find what is but a neutral band made to serve a very definite purpose. By reason of the slowly-moving procession sculptured upon it, diverging in two lines from the centre of the west front, the interest of the spectator is conducted to the entrance situated in the east or principal front. Individually the figures of horses and riders or maidens may be observed to be in perfect equilibrium, and could move backwards as readily as they could forwards.

But the long column of processionists heading in one direction produces its effect, and a steady and balanced tendency is directed towards the focus of the situation, where the dramatic scene of Athené's birth is being enacted. Here, in the east pediment, what we find is not a mere pictorial rendering of the event, or what might be supposed to be the conditions of such an event, any more than the frieze actually represents the Pan-athenaic procession, with its ship bearing the floating peplos, which was so evident a feature in the scene. The figures of the pedimental composition are equally chosen for architectural effect, and the fact that the groups are turned from the centre of interest when viewed merely pictorially has led to all manner of conjecture as to whether they are gods or mortals, symbolisms, or what not. Viewed architecturally, however, it is evident I think, that since the raking lines of the cornice must be counter-balanced, the action of the figures must be from the centre outwards. The effect of this grouping is so important that it cannot be allowed to be an accident of composition. The strength thus added to the building lines is seen at once in comparison with such examples where the direction is inwards, as on the Temple of Zeus at Olympia, or Athené at Ægina.

The sculptures at Ægina are elementary and tentative, while those at Olympia are careless in their execution. The keynote of the Parthenon, however, is the absolute completeness displayed in both the conception and finish of its detail, and the evidence of intention which is observable in every line of it. The forces suggested by the raking lines of the cornice must

meet and drop, and although translated into the new medium of pictorial line, the action continues one with the architecture, and the scattered vigour directed towards the angles is caught up again by the architectural lines.

The Parthenon frieze and pediment sculpture are the example of what I take architectural sculpture to be. It is not embellishment calculated to give effect to an otherwise bald and inexpressive production, as sculptors have lately given us to understand. It is architecture transposed if you will, or its musical score arranged for another instrument. There is no reason to suppose that these masterpieces were executed by other than skilled masons. Architectural sculpture and sculpture proper were two perfectly distinct trades with the Greeks.

The sculptor of the Phigalian frieze was the architect Ictinos, and Pythias, the architect of the Mausoleum, executed the famous chariot group. Pheidias, as comptroller of works, doubtless picked his men, and these men were moreover Athenians, and not provincial. Pheidias is a household word among us, but we know nothing individually about him, save that he died in prison, and his contemporary Myron in much poverty. Of the studio ghosts who must have worked these wonderful marbles we know absolutely nothing, much to their credit as artists.

Mr. Brett, when discussing architecture from a painter's point of view, hinted that she was far too ready to accept help from the allied arts, and he would like to see her rather express her whole self and nothing but herself. And such a sentiment is most corrective. There is too much stress laid upon the so-called unity of the arts, and the justification for it is, I think, not conclusive. Painters have been in the first place painters of easel pictures, and sculptors have been creators for dedication and portraiture in all periods, and when for an exception Raphael left his Madonnas to paint academic proprieties in the Vatican, or Tintoret placed his precious work where it cannot possibly be seen. Such result of co-operation is at least open to remark. And we should further note this, that as the painter and the sculptor came to the front, architectural painting and architectural sculpture went to the wall. From the gossip that hangs around the lives of painters like Zeuxis and Apollodorus, or the sculptor Lysippos, we may judge that their free and popular treatment produced a far greater impression than the grand style of the painter Polygnotos, the decorator of the Theseum, or of the unknown Pheidian sculptors who wrought the Parthenon-frieze.

As a matter of fact, the Greeks exercised a rigid distinction, and did not include architecture among the liberal arts (*ἐλευθέριαι τέχναι*) where they placed painting and sculpture, but among the useful arts which we now call the crafts.

Sculpture gradually became an embellishment as applied to architecture, as it continues to be, and as folk seem satisfied that it should remain. It is you architects who can revive its old feeling, if it may be done at all, and to this end you should know the figure sufficiently to enable you to make details of your sculpture where you employ it, as you would for any other portion of your design. While you may work from the life you should more particularly study the best sculpture itself, for we learn art from art and not from nature, who is our inspirer and not our master. There is yet another quality which we may notice and the value of which we may appreciate from the study of Greek work, prompted as it was by the nation's acute perception of what is due even to the materials employed. The history of sculpture especially shows us that the early years of artistic activity were directed to acquiring a knowledge of material. The Parthenon marbles are among the first examples to testify to this power over material having been obtained.

In the metopes this struggle is still either intentionally or otherwise apparent, and these, like the Aeginetan sculpture, possess that woodiness which fitly expressed the Dædaleon or Wooden Age. The large surfaces and the sharpness of detail which fine sculpture shows us are demanded by marble. In the Olympian sculptures, which immediately precede the Pheidian, they had arrived at the large surfaces but not the sharpness of treatment. In examples immediately succeeding that age largeness of surface showed evidences of being undervalued, and sharpness exaggerated into flicker, as in the detail of Niké Apteros.

These considerations, then, are some of the metaphysics of architecture. I have traced them as far as I am entitled to; their effects as architecture I must leave you to evolve and to admire. Let me conclude a review of these considerations by pointing out that I have avoided any suggestion that these elements were derived from the contemplation of natural phenomena, as flowers, the seasons, tides, and so forth. This may or may not have been their origin. It should be sufficient for us that we ourselves are a part of nature, and her laws and methods intervene in our lives equally as in the life around us. We are expressing ourselves when we employ these laws and methods as a language, and this is the function of art.

Although nearly everything which we now value has been

bequeathed to us from the Greeks, Greek art, as a concrete expression, died in the third century before Christ. We are still influenced by its suggestions, but not by the unity of its life. A new spirit, demanding new expression, sprang up with the Roman civilisation, which reached its full development in Mediæval times, and this spirit was the popular spirit. In art pure and simple the Romans had no facility of expression, and they borrowed the clothing of their buildings from the Greeks. It was Greek art, with the art left out.

In this direction, then, we can learn nothing from Rome. The prophet returned an evasive answer when asked, "Can these bones live?"—an Eastern habit, probably constitutional with him. We need be guilty of no evasion. Roman detail expresses nothing; and I am afraid it is, for that reason, only too serviceable—when you have nothing to express.

From the decline and fall of Rome we may seek warning, but not inspiration. The life of Rome, which has given us her great laws, lay in her people, and it was to the fulfilment of the popular life that we owe the legacy bequeathed to architectural style, for her baths, public buildings and halls of justice provide us with plans upon which the architecture of our own time is modelled. An agreement had taken place, as I have said, in ancient buildings, as to the fittest expression of certain paramount ideas. But on turning to the succeeding periods we find no such agreement. The individual, and not the collective perception is supreme; and such perceptiveness is formed of such infinite variety that we can only recognise it as the element known as individuality or caprice. Such a characteristic was unknown to older civilisations, where despotism ordained and coloured everything, as in Egypt, Assyria, and even Greece. The flexibility of Greek ideas, so evident in all they touched, never bent themselves to the claims of the individual. The Republic of Plato leaves him out in the cold, since his intrusion—possibly unwashed and unclothed—into a society which was to be of such unblemished respectability, that had its members been other than Greeks it must have been most unmitigatingly dull, could not be entertained by even the most advanced philosophy. Yet this sentiment doubtless saved her artists and kept them pure. Their life was in the workshop; they were regarded as tradesmen, and society left them unspoiled by its follies. It was the little band dwelling amongst the Lagoons of the Adriatic whom King Pepin tried to drive into the sea, and who afterwards became the great Venetian Republic that set the true note from which Mediæval art sprung. By her sea trade with Byzantine she became a repository of such arts as had descended from Athens and Rome, and under this influence built the most notable Western building of that time. How is criticism to help us here, where precedent is derided, and where the interests of common life on sea and land, usurp the sovereignty of ideas—in this changed state from law to caprice—from what is by nature communicable to what is by nature incommunicable? It is here that related knowledge becomes so serviceable. It enables us to look round and behind the capricious element, to catch it by the difference of treatment, perhaps, in architecture and poetry, but especially by an understanding of the life that lay at the back of that which is interesting to us, the life of the man and of the moment. By this means we may augment the volume of the song as the body of a viol augments the vibrations of the strings.

And this brings us very near the "poetry of architecture." The Italian cottage, with its white walls cresting the olive terraces, bosomed in grey and domed in blue, is indivisibly one with its scene. And were time able to touch it in its seclusion, as it touches the busier homes of men, it would in like manner belong to its time also. It is in this way that we may regard the creations of bygone days, and so augment the impression they make upon us. The tower of the Signori at Florence rears itself the straighter and dominates us with a sense of gathered power, when we hear the clash of its bell calling the citizens to arms, while its echo is answered by the hurry of feet and murmur of voices from the thronging piazza beneath. Or to speak of presences which are nearer to us, and which, as they keep audible silence in the midst of a city's cries, may tell us the eager story of their lives if we will stay and listen awhile. Our cathedrals tell us of days when they formed a shelter to the people who dwelt at the foot of their high walls, a hospitality shared with the homestead itself. For folks did not lead two lives. The kindly gossiping monk went in and out of their doors carrying with him the common interests of the day along with creed and benison.

The records of the religious or social guilds, for we are unable to distinguish a difference, describe this life for us. To such a guild, dedicated to one or more saints, all were admissible, man and woman, priest and layman, so long as he or she be of good report. Provision for decent burial with candles and night watches, feasts, services and processions on guild days, once, twice or thrice in the year as might be, ministered to the devotional element. The relief of the poor, loans on surety, even free loans to assist the young to obtain work, dowries to good girls of the guild, assistance to brethren imprisoned, hospitals for poor strangers, free schools, these and

many more kindly and social works did these guilds undertake.

I cannot refrain from quoting to you a portion of the ordinance from the return or deed of the Guild of St. Christopher, Norwich, of the fourteenth century. It opens with a prayer for the Holy Church, for peace, pope, cardinals, patriarch, Holy Land, archbishops, bishops, parsons, king, queen, dukes, earls, barons, bachelors, knights, squires, citizens, burgesses, franklins, and continues on behalf of all true tillers and men of craft, widows, maidens, wives, and for all the commonalty and christian people; for all true shipmen and true pilgrims that they may safely come and go; for the fruits of the land and of the sea; for brothers and sisters of the guild, and all christian souls, Amen. One beholds the same social unity in the Canterbury Pilgrimage. We have the same folk that have just been remembered in prayer. The friar, the nun, the poor parson, the knight, the shipman, the yeoman riding together merrily and unreservedly.

It was from the hands of the true craftsman prayed for, conjointly with bishops and prelates, that our great churches have grown. With this binding together of all classes, one is not surprised at a great unified type of architecture springing up, nor a spirit of gentleness and devotion, one with the lives and homes of the true craftsman, manifesting itself in a devotional and homely manner upon the graceful detail. Thus we find the quaint and grotesque carved on boss and corbel, and a delightful innocence and freedom displayed in the intersection of mouldings, while the cresting pinnacle, with its eager clamoring leaves, from beneath which laughs some elfish countenance, tells the delight of the conquering hand that raised it. In this spirit may the critic linger in our cathedrals. He must not tell us that these pinnacles are the prototype of the flag-staffs which Egypt lashed to her pylons. It may be a fact, but it is a fact that bears not a ray of expression upon its face. Gothic architecture rather wears, like Wordsworth's mistress,

A countenance in which did meet
Sweet records, promises as sweet.

And one is veritably nearer to its spirit in verse than in anything else. We have, in conclusion, the second value of criticism to consider—that it has the power to create new and fresh ideas, to furnish an atmosphere when our surrounding conditions are against us, in which we can best work. I will not go so far as does a modern author, who declares that everything that concerns us in the present is inconvertible into art, and that it is precisely because Hecuba was nothing to anybody that she forms so suitable a centre for tragic motif. On the other hand, the statue of an heroic policeman lately erected in Chicago, which suggests to us more than anything our old friend demanding who stole the sausages, may well, if I may borrow the descriptive Transatlantic language, take the cake as an experiment in modern inspiration. Yet beneath the hideous veneer of modern life the passions surely are there which created and moved through Greek drama, and which Shakespeare worked into his material. But while we have to mine for them, these ideas and passions were then in the air. Listen, quoths a modern seer—"there never was an artistic age." Truly not. A shipman upon the Piræus knew no more about art than did Queen Elizabeth's turnspit, nor either of them more than a sixth standard school-boy to-day. But they knew more of the passions and ideas out of which art is made. So far, then, Mr. Oscar Wilde is right. We must turn to days such as these for inspiration, for we shall not find it in the interests which surround us. In saying this I do not propose, like Mr. Gilbert's hero, "to be eloquent in praise of the very dull old days that have long since passed away." Every man belongs to his time. But I would urge that we cannot expect to have our cake and eat it. We cannot hope to be famous for everything, and just now we are famous for commercialism and common sense, both inimical to art. By common sense let me explain that I mean what Mr. Ruskin doubtless does, when he declares it to be no sense at all, a condition of mind which is chiefly remarkable by an inability to see the incongruous, whereas to coax congruities out of incongruities, with just a flavour of the incongruous left on, forms one of the first lessons in art. Yet if we are to push our craft and carry our mission into the enemy's land, it is most necessary to have some acquaintance with commercial methods.

Further, since function is an indispensable element in architecture, one indeed which distinguishes it as a so-called useful art from an imitative one, the inarticulate wants of an inarticulate age have to be mastered and marshalled before there is any hope of clothing them with architectural effect. It is function which dictates in the rough the shape of everything as we see it—for instance, in a spoon, a pin or a ship—and function it was which planned a Gothic cathedral and a Greek temple. In contrast to these simple types let us picture to ourselves the function of a modern hall of justice, with its cloud of witnesses, its judge, jury, counsellors and prisoners, with a myriad untold minions of the law, all demanding twice the accommodation they want or expect to get. But they will require some semblance of their wishes being met, and it would

be no good presenting them with a design for a basilica, and tell them to fit it up with pens for themselves. To meet what are considered to be modern requirements an architect must possess no mean organising power. Also we must remember that we are not like the sculptor and the painter, who execute their own work. We have to employ others, or get somebody else to employ them, if we would see our creations grow into life; and to get this much done requires all the tact of which we are capable. These faculties cannot be neglected, and yet we must always remember that they are but the servants of our craft, who is our mistress.

We are to-day in an age of transition from one of authority and pedantry towards one where the freedom of the individual largely enters. A hundred years ago Stuart and Revett's book set a fashion which kept its head above water into the first half of the century, when the Gothic revival finally swamped it. There is a fine touch of melancholy about these Stuart buildings, as though erected in memory of an art impossible to revive; and I always think of the architects as very silent gentlemen in black, wearing weepers and undermined by grief. They, at least, made little stand against the robust Goths when prosecuting their second invasion. These brought back with them the old sense of freedom, but marred by eclecticism. They were so horribly afraid of doing what was wrong that they were always doing it, as is the custom with excessive virtue. The low-pitched roofs of the fifteenth century came off wherever they were found, and the ghostly traces of a high pitch were sought for upon every tower. In us the new spirit of freedom has gained power, and the accumulated reaction against the pedantry of both modern Greek and modern Goth is inclined sometimes, perhaps, to make us break bounds. Therefore we should not be unmindful of the old Greek restraint, a quality always present in fine art. Caprice without reasonableness appeals only to one part of our nature, and without its restraining power we lose a nice sense of the fitness of things.

Laws which we have seen paramount in Greek architecture are paramount to-day, and a musician who cannot evolve a fugue from some given phrase, or a sonata from certain melodies, is very naturally disqualified by his *confrères*. Happy is the young architect who from rhythm and the developments of rhythm early discovers himself to be unable to construct in obedience to the laws that govern these qualities, for the profession of millionaire is still open to him.

This Association possesses unrivalled opportunities for assisting in such a discovery, and it might well include among its parental duties a quorum of fathers who should communicate this advice to a young son, both for their own sake and for that of the craft whose reputation we have in keeping. And for the rest of us, let us familiarise ourselves with such things as are of good report, that our efforts may not be in vain.

An age has never been so full of endeavours as this that can never bear fruit and come to perfection, and chiefly for want of direction. Happily for us, we had our infant complaints so badly and so universally in the Greek and Gothic movement, that we have no sickness on us to compare with the epidemic of Ibsen and Anglo-French painting. There is, I venture to think, a better all round excellence of work done in architecture than in any of the other arts. Perhaps for this reason there is not that brilliancy and distinction in our work that belongs to individual groups in other lines of creative effort. A modern impulse is distinctly evident in those fields where the poets Arnold and Rossetti, and the sculptor, Alfred Stevens, left their mark. One could only wish that the painters George Mason and Fred Walker were equally well remembered.

And in architecture we have our influences, for Burges, E. W. Godwin and Sedding should be no mere names. What I think should be most desired by us is that some common-sense should invade our work, which would not mean monotony of style, since there would be no agreement as regards expression, wherein, I may remind you, lies the stumbling-block of academies.

It is where two or three are gathered together that enthusiasm burns, and a guild or association of students thus holds latent immense possibilities. Our time is especially for the young, in spite of the anxiety of our parents as to what they shall do with their sons. Well directed effort is no longer decried as innovation. It is towards a right direction of effort that criticism tends, and giving to this quality its due weight, it is for us to go forward.

Mr. LEONARD STOKES proposed a vote of thanks to Mr. Tait for his paper. Mr. Stokes expressed his opinion that Greek art was tied down more by rule than Gothic, and therefore was not so high a form of art. Art threw rules to the wind. Greek art was for study, to see what to avoid as well as what to develop. It was also more of a style from which to crib. Simple buildings that depended on proportion were often more satisfactory than ornamental buildings. In the same way, as regarded function, it was rare to see a ship or even a locomotive that had not its own style of beauty.

Mr. MOUNTFORD seconded the vote, and urged the necessity of restraint in design instead of trying to get all one

knew into a building. He thought Mr. Tait deserved their thanks for coming so far to read his paper to them.

Mr. GOLDSMITH remarked that he did not agree with Mr. Stokes in considering Greek a cut-and-dried style. It seemed to him that there was as much elasticity in Greek as in Gothic style.

Mr. COLLARD and Mr. PRYCE supported the vote.

The PRESIDENT having put the vote to the meeting, Mr. Tait replied briefly, and recalling that he had said, describing Greek as communicable and Gothic as incommunicable, said he gave the highest place to Gothic.

TESSERÆ.

Painters and Scenery.

WHY is it that usually what we term beautiful scenery was seldom the ground of the old painters? They were not, generally speaking, painters of views; and why not? There the pictures were made for them. They and all the world had the thing before them to love and to admire—it was already done; there was no room for their genius, which is a creative, not an imitative, faculty. The scene for every eye was not theirs. They found that by their art they could take nature's best feeling even from her fragments. It requires not an alp to portray grandeur. Fifty feet of rock, precipitous or superimposing, will better represent the greatness of danger, for it is a more immediate and solid mass to crush the intruder, and the form may frown with a demon malice. The whole awe of darkness may be felt in a cavern of a few feet space. Indeed it may be almost said that largeness is not to be obtained on the canvas by the largeness of whole extensive scenes in nature, but by the continuous lines of near masses; whatever is actually largest in nature—the forest and the mountain—in art may with advantage occupy the smallest space. For the best magnitude here is in perspective, and in that aerial tone which, as a veil, half conceals, and thereby makes mysterious, and converts into one azure whole the parts which would otherwise be seen, but break up the great character. The Arabian genii were greatest when dimly seen through smoke and vapour. Art, indeed, differs from nature in this as regards the pleasure derived through the eye, that nature allows you many unperceptive views at many instant glances, and therefore surprises us with a sort of perspective impossibility, of which the judgment at the time is not cognisant, whereas art is bounded by a rule, looks not all around, and comprehends by mind beyond the eye, but is constrained to frame in the conception. It must, therefore, make to itself another power, and this power it finds in form, in light and shade and colour, all which are in greater intensity and force in the fragmentary parts than in the whole and large scenes. It is a step for the young artist to believe that art and nature are not and should not be the same—that they are essentially different, and use their materials differently, have other rules of space and largeness. If art be more limited its power is greater by being more condensed—with its impressions more certain, because more direct, and not under the vague and changeable process of making an idea from many perspectives.

Ancient Roman Easements.

In Roman law there were two sorts of Prædial Servitudes or easements, viz. Urbanæ and Rusticæ. The former related to edifices, the latter to land. The following are the principal Servitudes Urbanæ:—1. *Oneris ferendi*, or the right which a man has to use the edifice or wall of his neighbour to support his own edifice. The owner of the servient property was consequently bound to keep it in repair, so that it should be adequate to discharge its duty. 2. *Tigni immittendi*, or the right of planting a beam in or upon a neighbour's wall. 3. *Proiciendi*, or the right of adding something to a man's edifice, though it shall project into the open space which is above his neighbour's grounds. 4. *Stillicidii*, or *fluminis recipiendi* or *immittendi*. This servitus was either a right which a man had for the rain-water to run from his house upon and through his neighbour's premises, or a right to draw such water from his neighbour's premises to his own. The technical meaning of *Stillicidium* is rain in drops; when collected in a flowing body it is *Flumen*. 5. *Altius non tollendi*, or the duty which a man owed not to build his house higher than its present elevation, or the duty of the owner of a piece of land not to raise his edifice above a certain height, in order that the owner of some other house might have the advantage of such forbearance. If a man was released from this duty by his neighbour, he obtained a new right, which was the *Jus altius tollendi*. In like manner a man whose ground was released from the *Servitus stillicidii* was said to have the *Servitus stillicidii non recipiendi*. This was not strictly accurate language, for if a *Servitus* is defined to be some limitation of the usual rights of ownership, a recovery of these rights or a release from the duties which is implied by the possession of these rights by another, merely gives the complete exercise of ownership, and so destroys all

notions of a *Servitus*. Still, such was the language of the Roman jurists, and accordingly we find enumerated among the *Urbanæ Servitudes*, "*Stillicidium avertendi in tectum vel aream vicini aut non avertendi*." 7. *Servitus ne luminibus* (and *ne prospectui*) *officiatur*, or the duty which a man owes to his neighbour's land not to obstruct his light or his prospect, and *Servitus luminum* or *prospectus*, or the duty of a man to allow his neighbour to make openings into his premises, as in a common wall, for instance, to get light or a prospect. It was a *Servitus* the object of which was to procure light, whereas the *Ne officiat* was to prevent the destroying of light. But there are different opinions as to the meaning of *Servitus luminum*. 8. *Servitus stercolinii*, or the right of placing dung against a neighbour's wall, &c. 9. *Servitus fumi immittendi*, or the right of sending one's smoke through a neighbour's chimney.

The Precious Metals in Art.

The addition to their wealth which was derived from the scarcity of gold and silver by the affluent led to a rapid and most important increase in the consumption of those metals in articles of luxury. Gold and silver plate, jewels and other ornaments set in gold became general among the richer classes, and to an extent unprecedented since the fall of the Roman Empire. Gilding was employed so much in furniture, the frames of pictures, the roofs of rooms, carriages and other articles of state or show as to withdraw a considerable part of that most precious of the precious metals from the monetary circulation. The scarcer gold and silver became, the more was this direction of a large portion of it increased, because the richer did the fortunate few who possessed amassed capital become from the daily decline in the price of all other articles of merchandise. This effect was most conspicuous in ancient Rome in its latter days, where, while the armies dwindled into cohorts from the impossibility of finding funds to pay them in large numbers, and the fields of Italy became desolate from the impossibility of obtaining a remunerating price for their produce, the gold and silver vases, statues and ornaments amassed in the hands of the wealthy patricians in Rome, Constantinople, Alexandria and the other great cities of the empire, so prodigiously increased, that, with the currency, which formed but a small part of its amount, their value is estimated by Gibbon at the almost incredible amount of 350,000,000*l.* sterling.

Inigo Jones and Palladio.

On the occasion of his second visit to Italy, Inigo Jones took books of authority with him, and made memoranda wherever he went. His copy of Palladio (the folio edition of 1601), preserved at Worcester College, Oxford, contains an entry dated "Vicenza, Mundaie, the 23rd of September, 1613," and one of his sketch-books (a thin octavo in a parchment cover, with green strings, now in the possession of the Duke of Devonshire) exhibits his name on the fly-leaf, with "Roma, 1614," written in his fine, bold hand beneath it. The copy of Palladio is as rich with notes in Inigo's handwriting as the Langbaine, in the British Museum, is with the notes of Oldys. One of his entries commences thus:—"In the name of God, Amen. The 2 of January, 1614, I being in Rome, compared these desines following with the Ruines themselves. Inigo Jones." At folio 64 he has written, "The staires at Chambord I saw, being in France, and there are but 2 ways to ascend, y^e small hath a waal, w^h windowes cut out, but this, y^e seems, was discoursed to Palladio, and he invented of himself thes staires." His Palladio was his inseparable companion wherever he went, and contains the names of Andrea Palladio and Inigo Jones, coupled together in his own handwriting; such was his admiration and such his ambition. At b. iv. p. 41, occurs the following entry:—"The Temple of Jove, vulgarly called frontispicio di Nerone, or a basilica; sum call it a Temple of the Sun, and that is likelyest." The book was with him, as appears from his own entries, at "Tivoli, June 13, 1614;" at "Rome, 1614;" at "Naples, 1614;" at "Vicenza, 13 Aug., 1614;" and at London, "26 January, 1614," *i.e.* 1614-15. Nor did he cease to carry his Palladio about with him even in his progresses in England as surveyor of the works. The following is written on a fly-leaf:—"The length of the great court at Windsour is 350^{fo}, the breadth is 260; this I mesured by paces the 5 of december, 1619. The great court at Theobalds is 159^{fo}, the second court is 110^{fo} square, the thirde court is 88^{fo}—the 20 of June, 1621. The front of Northampton Ho. is 162^{fo}, the court is 81^{fo}. The first court at Hampton Court is 166^{fo} square. The second fountaine court is 92^{fo} broad and 150^{fo} longe. The Greene Court is 108^{fo} broad and 116^{fo} longe, the walkes or cloysters ar 14^{fo} betwene the walles. September the 28, 1625." Of the Temple of Jove he thus writes, June 13, 1639:—"Clemente scoltor Romano told me that the ruines of this temple is pulld all downe to haue the marble, by the Constable Barbannos Collona, by the popes permission: this was the noblest thinge which was in Rome in my time. So as all the good of the ancients will bee utterly ruined ear longe."

NOTES AND COMMENTS.

A PAPER was read at last week's ordinary meeting of the Society of Arts by Professor HARTLEY of Dublin, which calls for some notice, as a part of it treated of the oils used in painting. The ordinary boiled oil was condemned because (1) it causes a brownish or yellow colour to be communicated to white lead or zinc white; (2) it darkens pigments containing brilliantly coloured metallic sulphides, such as vermilion, cadmium yellow and ultramarine blue; (3) delicate colours are darkened by the oil when exposed to ordinary town air, that is to say, air which is not quite pure; this is the case even when the oils themselves may not injure the paints. The professor (in conjunction with Mr. BLENKINSOP), has a process for preparing drying oils of a pale colour; that is, first refining the oil by the removal of water and mucilage; second, boiling and bleaching the oil at one operation. The prepared oil has been used for decorative house painting for both indoor and outdoor work, on wood and on metal. It has also been used as a coating for iron work without the addition of a pigment. It is claimed that with a pale boiled oil zinc white retains its pure white colour. Delicate tints and colours containing sulphides are not darkened in course of time. For indoor decoration, for painting of ships, railway carriages, railway semaphores, signs and stations, such oil is free from liability to alter the colours with which it is mixed owing to its freedom from lead, which is darkened by traces of sulphuretted hydrogen in the air, to which such paints are exposed. Gasometers in gas-works may be painted an unalterable white with such oil and zinc white. But in this case also the zinc white must be free from lead carbonate or oxide.

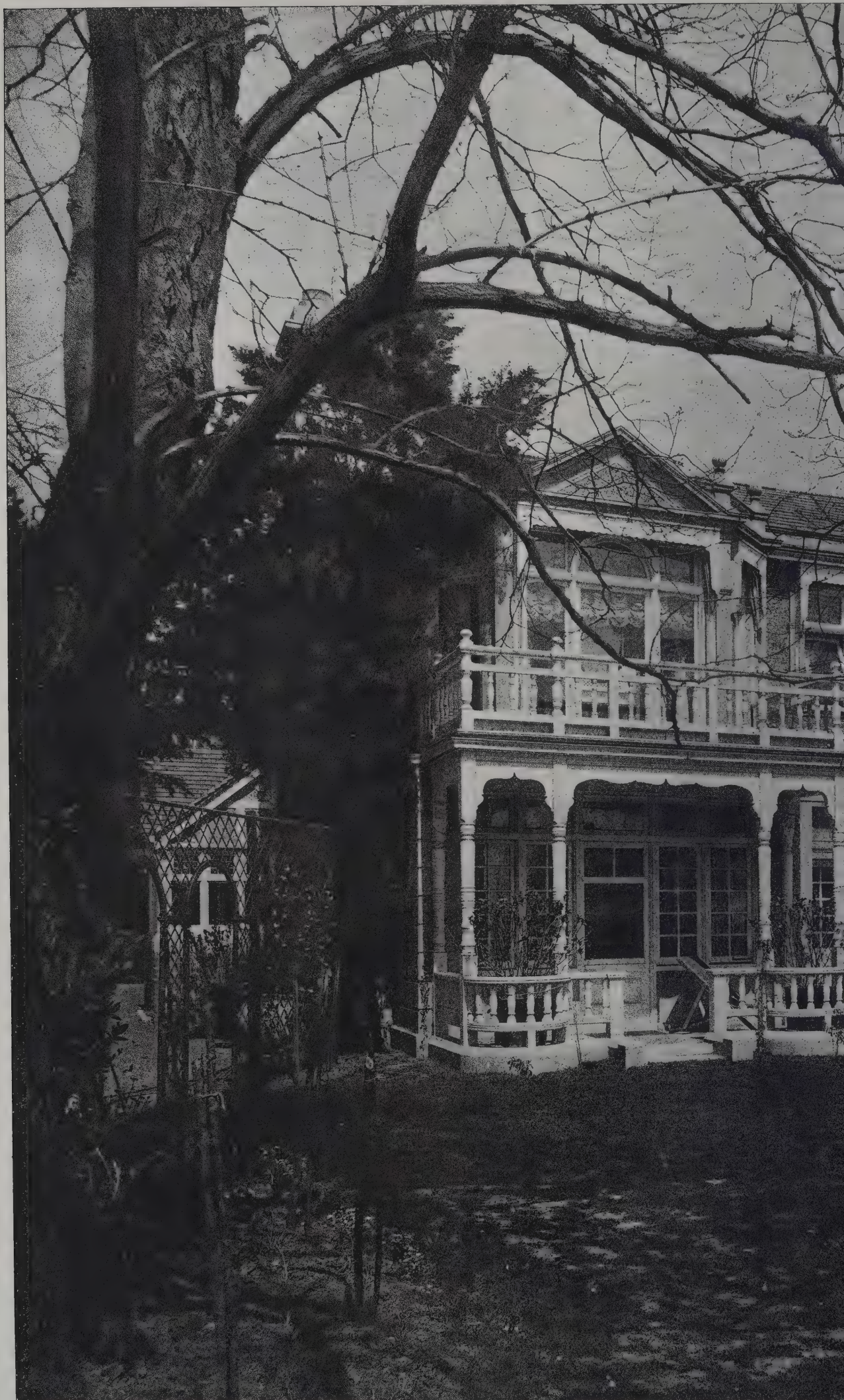
ONE of the inconveniences which students of architecture and archæology in Great Britain have to put up with is the loose way in which speakers and writers on ecclesiastical subjects treat the history of church buildings. For doctrinal purposes it may be becoming to ignore facts, in the same way as KATHERINE, after lessons from PETRUCHIO, was willing to declare that day was night and age was youth. We have, happily, nothing to do with that policy. But what we do object to is that buildings which were erected for uses which were rigidly prescribed should be treated as if they were designed for uses which may be said to be opposed to the intentions of the designers. A few days ago we read how a clergyman of the Scottish Episcopal Church, in the course of a speech, said:—"We see around us on all hands great improvements both in Presbyterian architecture, in Presbyterian ritual, and in Presbyterian worship. May I venture to ask who taught our fellow-Christians in Scotland to love the aerial spire and to revel in the exquisite symmetry of the Gothic arch? Who taught them the sweetness of the painted and storeyed window? I think I may say that we have our share in the credit of being the schoolmaster of Scotland in these matters." Now it might be imagined from what was said that the Presbyterians were indebted to the Scottish Episcopalians. If it will be remembered that Sir WALTER SCOTT, who was one of the latter, could describe his co-religionists as forming "the suffering and Episcopal Church of Scotland—the shadow of a shade now, and fortunately so," it must be plain that until comparatively recent years the Episcopalians were not in a position to erect buildings like those which are to be seen in Edinburgh, Inverness and elsewhere. They could not, therefore, possess examples of exquisite symmetry which were worthy of imitation. It will be said that for centuries prior to the establishment of Episcopacy by JAMES I. in 1617 there were such churches. Architects, however, must know that the old churches were not planned for services like those which are now approved, and however politic it may be to appropriate them in theory, some regard ought to be given to history.

ACCORDING to FERGUSSON, the introduction of the use of stone for architectural purposes in India was owing to ASOKA, who reigned from B.C. 272 to 236. The Buddhist sovereign is supposed to have fixed his capital at Palibothra or Patna beside the Ganges. The Bengal Government having ordered the site to be surveyed, a report on the results has been prepared by Major WADDELL. The posi-

tion of the palace has been easily discovered, for it appears it is difficult to sink a well without finding remains of stones that are elaborately carved. In the seventh century a Chinese pilgrim visited Palibothra, and among the wonders he saw there was a stone on which Buddha had left impressions of his feet. Strange to say, a stone still exists on which traces of colossal footprints, that is, 20 inches by 6 inches, are to be observed. For archæologists the parts of large beams of *sal* wood which are excavated by the peasants, will have more interest, for they may have formed part of ASOKA's palace. The Hindus are rather fearful of the wooden fragments. The officers of the Archæological Survey of India have tried to identify Palibothra with another place but without success. It is, therefore, possible that Major WADDELL's discovery will be undervalued by the official world, but on that account it deserves to be followed up by the Bengal Government.

THE Council of the Yorkshire Archæological and Topographical Association have made arrangements for the incorporation of the society. A similar course has been adopted from time to time by many public bodies, and has several advantages, the chief of which is that it gives a society a legal status, and enables it to hold property without the intervention of trustees; and without the consequent difficulties caused by deaths, changes of trustees, &c. The management of the association will also be far better and more clearly defined under the proposed memorandum and articles of association than under the old system, and the powers, rights and privileges of the council and of individual members will be more clearly understood. The council believe that the proposed change will be for the benefit of the association. In 1891 there was a deficit of 20%, while last year's accounts show a balance of 54% to the credit of the association. The annual report also states that the council have adopted the arrangements of the Archæological Society, in union with the Society of Antiquaries, and will issue the index of the archæological papers which appeared during the year 1891. It is impossible to overestimate the value of this publication, which gives the titles of all papers printed in the proceedings of forty-three metropolitan and provincial societies. In the record series one volume has been issued of the "Abstracts of Yorkshire Inquisitions of the Reigns of HENRY III. and EDWARD I.," which has been prepared by Mr. J. A. C. VINCENT. The material for another volume is being prepared by Mr. VINCENT. The second volume of the Selby Coucher Book is nearly ready. Another volume of the index of the York Wills (1554–1568) is in the printer's hands, and will form the first volume for 1893. The first of a series of full abstracts of Royalist composition papers for Yorkshire, which have been prepared at the cost of Mr. J. W. CLAY, will appear during the year. Mr. W. PALEY BAILDON's volume of Monastic Notes, which gives much new and interesting information relating to Yorkshire monastic foundations, will probably form one of the volumes for 1894. The indexing of the York Wills is in the hands of Mr. A. GIBBONS. About half of the special fund provided for indexing purposes has been expended. The Council have during the past year acquired from Mr. H. WHITWAM an Index of Yorkshire Fines for the reign of EDWARD I., and propose to print it in due time. Mr. THOMAS BROOKE, F.S.A., of Huddersfield, has been elected president of the incorporated society.

LOCKWOOD's "Price Book for 1893" has appeared, and is edited, as in past years, by Mr. MILLER. It contains about six hundred pages of closely-printed matter. LAXTON's, which is published by Messrs. KELLY, again contains, in addition to the customary information, abstracts of law cases. Messrs. SPONS' "Price Book" is characterised by an endeavour to condense the items and to save labour in consulting the pages. French contractors must envy their English brethren, who are able to obtain the means of testing prices at so cheap a rate. They have to pay far more for the official prices than the three volumes will cost, and they often find that the figures have little relation to the markets for materials or for labour. The enterprise of the three firms of English publishers has made estimating comparatively an easy operation.

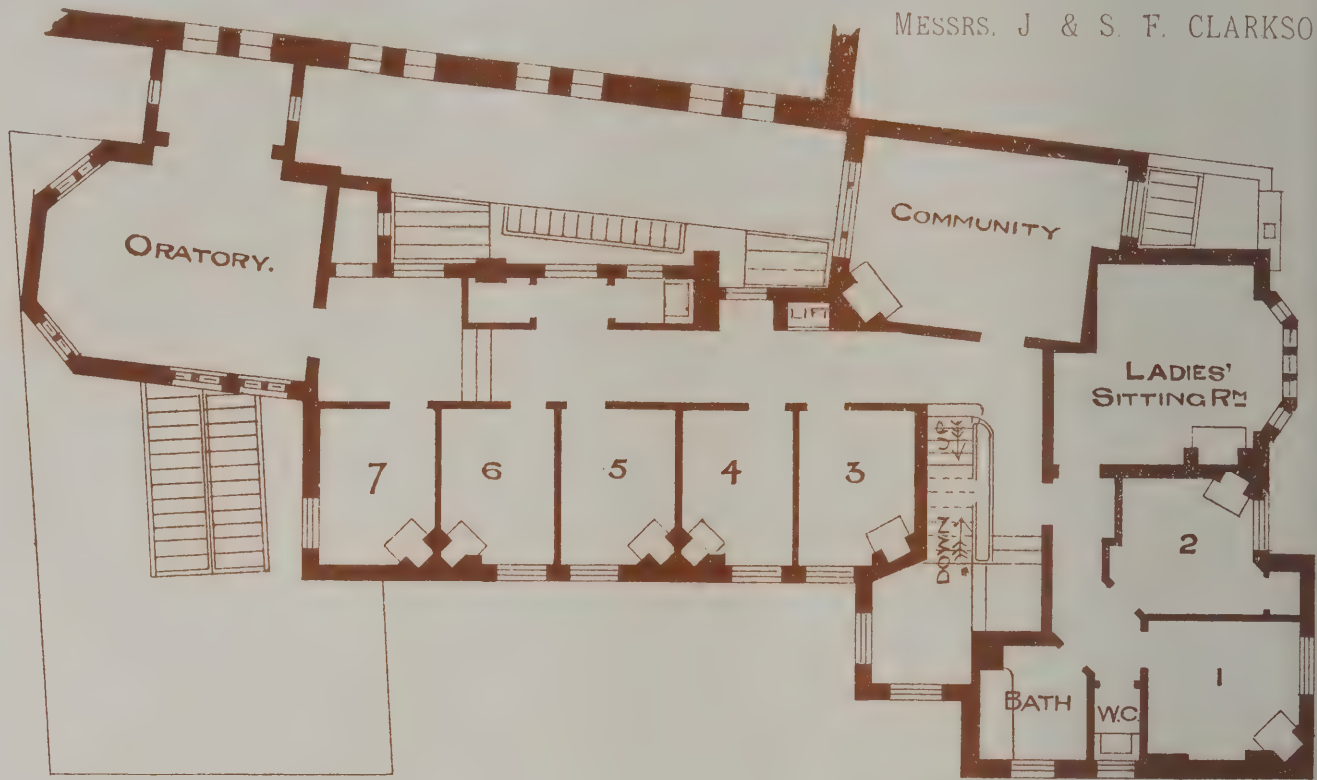


"ROSECOURT,"
Messrs. DAVIS



S. FRIDESWIDE'S MISSION HOUSE, POPLAR.

MESSRS. J & S. F. CLARKSON.



FIRST FLOOR PLAN.



GROUND PLAN.

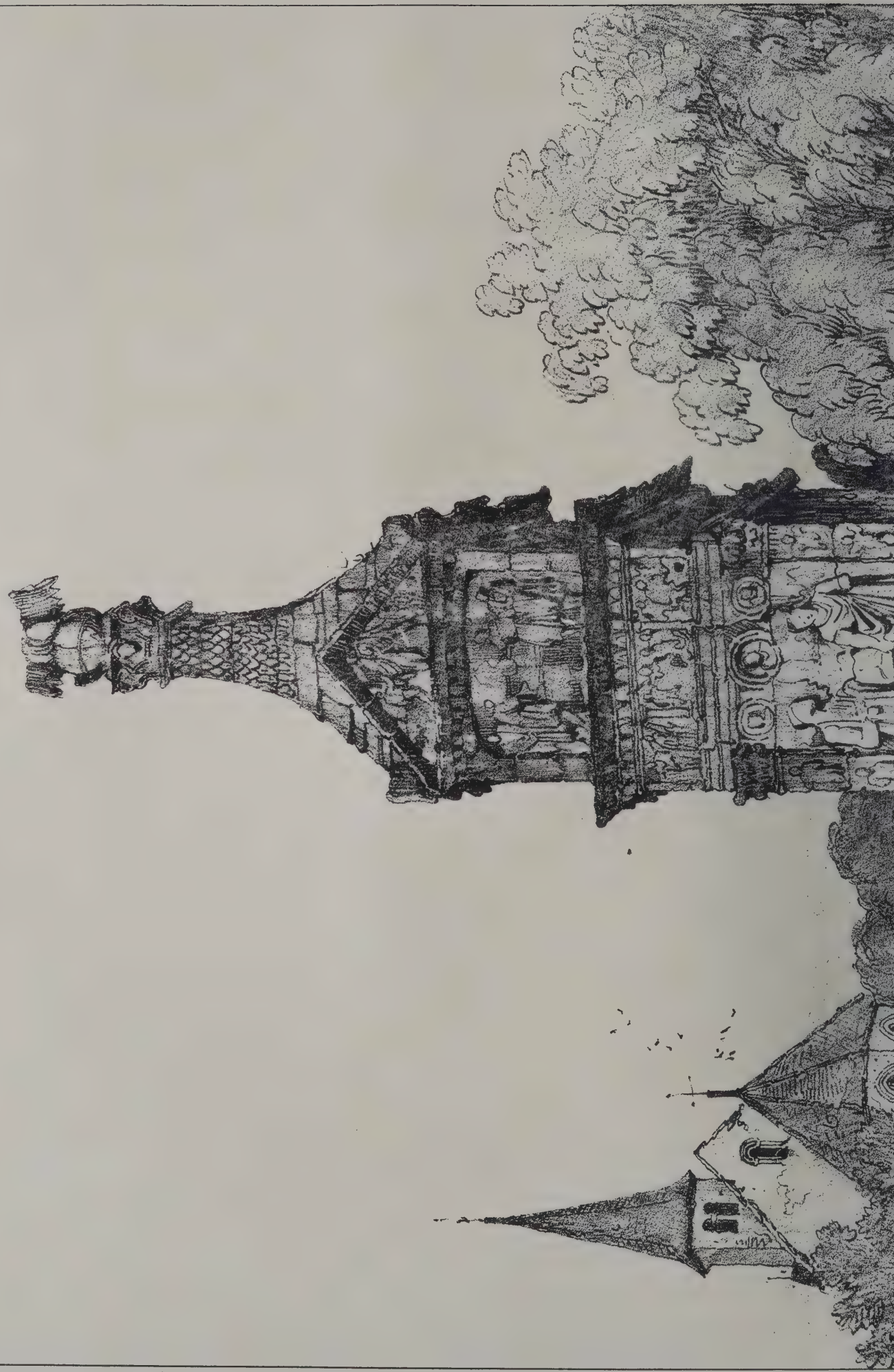
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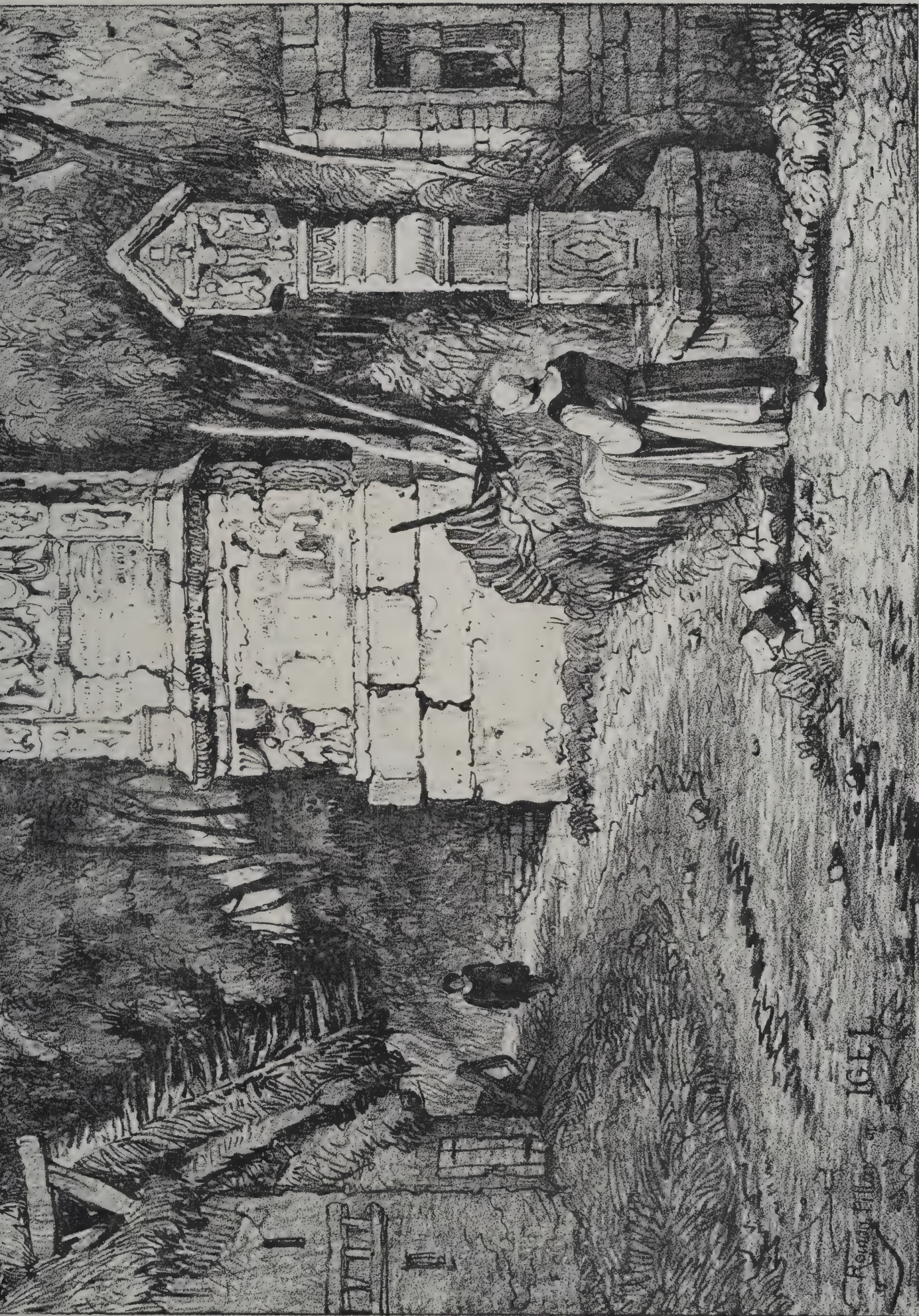


SKETCH VIEW.



ELEVATION TOWARDS LODORE STREET





PHOTOGRAPH BY SPRAGUE & CO. 415 EAST HARDING STREET, FETTER, LANE, E.C.

ROMAN PILLAR AT IGEL.
Drawn by SAMUEL PROUT.

ILLUSTRATIONS.

ROSECOURT, ROMFORD.

THIS characteristic example of a modern type of country house is by Messrs. DAVIS & EMANUEL. There is no reason why the Australians and Americans should be allowed to monopolise verandahs, which they regard as their property. The plate is from a photograph by Messrs. BEDFORD LEMERE & CO.

ST. FRIDESWIDE'S MISSION-HOUSE, POPLAR.

THE Mission-house and Girls' Club (illustrated this week), situated in the midst of a very poor neighbourhood in the north of the East India Dock Road, have been erected and fitted up at the cost of Miss CATHERINE MARY PHILLIMORE, "in memory of those at rest and in furtherance of the work of the Christ Church Mission." In 1881 the Christ Church (Oxford) Mission commenced working in this neighbourhood, the first priest being the Rev. H. L. PAGET, now vicar of St. Pancras. The buildings then used were cottages which stood on the site of the new Mission-house. The part of the building occupied by the Clewer Sisters is on the west portion of the site, and comprises four storeys. Plans of two of the storeys are given in the illustrations. On the top storey are five dormitories, a work-room, a laundry and a garden. On the lowest storey is a large waiting-room for applicants for assistance and advice; part of this room will be used as a soup-kitchen in the winter. Gas-coppers are provided, raised very little above the floor. This room, and the whole of the kitchen department for the community on the ground storey, are lined with white glazed bricks.

The intention has been to provide everything required for the work of the Mission, without any excess of size in rooms or passages. "The Chapel of the Resurrection" for the use of the residents has been placed at the south-east of the one-pair storey. On the ground-floor the east portion of the site is devoted to rooms for the St. Frideswide's Club and Guild for Girls. There is communication from the interior of the Mission-house to these parts of the building, which is also reached from Duff's Fields. A small complete set of rooms for the donor and a friend, to be used when assisting in the work of the Mission, forms the west portion of the one-pair storey.

The building is heated by low-pressure hot water, the boiler being placed in the basement, and there are radiators in the rooms, passages, staircases, &c. This work has been done by Mr. ROBERT CRANE, of Binfield Road, Clapham. The tiles for the passages, &c., were supplied by Messrs. BOOTE, who have also supplied glazed tiles for dados throughout the building. Messrs. BRADY & THORNBOROUGH fitted up the swivel partitions. Messrs. VAUGHAN & BROWN, of Farringdon Road, supplied the gas fittings, many of them being specially designed for their positions. FAWCETT'S fire-resisting floors are used throughout the ground storey, and floors of wrought-iron and concrete in all passages, &c. elsewhere. The staircases are of solid concrete steps, formed *in situ*, with stone treads. "Silex" brand, Hipperholme stone, supplied by Messrs. J. BROOKE & SONS, has been used for the steps and for all the stone paving. Wood-block floors have been used in a number of the rooms. The lifts are by Messrs. WAYGOOD & Co.; the laundry fittings by Messrs. BRADFORD & Co.; the locks by Messrs. HILL & Co.; the "Teale" stoves by Messrs. EDWARDS & SON; and the Hopton wood chimneypieces mainly by Messrs. KILLER BROTHERS, of Wirksworth. The statue of St. Frideswide, in the niche over the Lodore Street entrance, is by Mr. FORSYTH.

The building was carried up to the ground level by Mr. J. K. COLEMAN, builder, of 120 High Street, Poplar. Messrs. SMITH & SONS, of Norwood Junction, obtained the contract for the superstructure, and have also carried out fittings specially designed for every portion of the buildings by Messrs. CLARKSON, F.R.I.B.A., of Poplar, and 28 Great Ormond Street, W.C., Miss PHILLIMORE'S architects. Mr.

HODGE was Messrs. SMITH'S foreman, and Mr. CONRADI has acted as clerk of works throughout.

Mrs. GLADSTONE, the wife of the Prime Minister, opened the building last Saturday, the 11th inst.

ROMAN PILLAR AT IGEL.

THE THEORY OF STORATION IN ART.*

Section 1.—Definitions.

STORATION is that section of the rules of applied art which governs (a) the selection and (b) the representation of meaning in the decoration of objects. The selection will be treated of in sections 4 to 8. The representation will be treated of in sections 9 to 14. The meaning must be definite and intelligible. Much decoration consists of mere geometrical lines or brushwork without any direct meaning, and this is of course excluded. The objects may be anything, from a sculptured building to a painted chair-cloth, which can be made more beautiful by the aid of art. Storation, as being mainly literary, lies outside the two great artistic virtues—truth and beauty. Truth of imitation is first—the imitation of the forms around, the gathering of artistic detail. Beauty is second—the selection and arrangement of the gathered detail of line, mass, and texture, in pleasing combination, proportion, modulation, variety, &c. Meaning is the third—the beautiful arrangement of truthful imitation having something added beyond what they can give, which appeals to the intellect and tells a story. The word is a new one, and the writer who is responsible for it recognises the onus of showing the necessity of an equivalent, the fitness, and the analogy with existing words. The necessity came when the early peoples began to record or tell stories on their tent-cloths or cave faces, *i.e.* to show to whom these belonged. As developed there are seven branches included in the word:—Inscriptions, &c., the most simple; heraldry, symbolism, landscape-painting, iconography, portrait-painting, and historic-painting, the highest. The same man or woman might do all these, but we are justified, by the division of labour in art, in regarding them as separate. The two often used words, "iconography" and "symbolism," cover only half the ground; historic paintings, such as Sir Frederick Leighton's at South Kensington, or those in the corridors of the Houses of Parliament, are neither iconographic nor symbolic (except in a very far-fetched sense); and neither are the names of potters and potteries, which are yet part of the decoration in the Ceramic Gallery at South Kensington. Heraldry, which is often the only clue to authorship and date in architecture, is (by reason of giving information), a branch of storation; but it lies outside of the two often used words. Hence the necessity for one single comprehensive term for the whole. The fitness will be perceived in the following. The analogy will be seen on reading in Harrison's "Description of England," 1580:—

... only the stories in the glass windows excepted;
in Milton's "Penseroso," 1637, line 159:—

And storied windows richly dight,
Casting a dim religious light;

and in Gray's "Elegy," 1749, line 41:—

Can storied urn or animated bust
Back to its mansion call the fleeting breath?

Section 2.—Divisions.

There are three mental stages in the process of storiating an object. The purpose, or function for which the object is intended will be ascertained, section 3. Those ideas associated directly or collaterally with the purpose which are capable of artistic expression will be considered, section 4. Those methods of representing the ideas which are technically possible will be selected, section 9.

Section 3.—Purpose.

The purpose of the object is not at the artist's choice. It is one of the data of his work, and it (generally) determines the treatment.

Section 4.—Associated Ideas.

In considering ideas, the storationist may either dig deeply or dig widely. He may search back, far into the past, and show the evolution of the particular subject, in its direct descent; or he may survey widely in contemporary manners and customs, and show the cognate subjects, in collateral descent.

Thus, in a theatre, the storationist might trace the evolution from the old Greek tragedies, which were religious and patriotic functions, with fate and controlling power involved in their action—through the comedies, no longer religious but for class amusement, in which the gods were ridiculed and relegated to

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the background while human craft and passion constituted the weft of the fabric—through the miracle-plays of the middle ages, the moralities of the Renaissance, the plays of the Shakespearean cycle—down to the comedy of manners of the present day. Or, on the other hand, the contemporary varieties of the art, symphony, oratorio, opera, passion-play, history, tragedy, comedy, pantomime, as they are modified and mingled in various countries, might be exhibited. These two directions, in which the ideas are sought, will perhaps impress upon people the fact that they are not isolated, but links in two chains, one reaching back to the past beginnings of things, and the other by community of art joining all present existences, and so forming that net of sympathy which encloses all.

Section 5.—Groups of Ideas.

The ideas connected, directly or collaterally, with the purpose of an object are innumerable, and it is impracticable to set them down in order; but they may be divided into groups as follows:—(a) Those which are appropriate to the purpose (see section 6); (b) Those which are incongruous (section 7), and (c) Those which are indifferent (section 8).

An instance might be seen if, to choose a homely one, an embroidered seat-cushion were to be decorated with the imitation of (a) moss and violets; (b) a bird's-nest with eggs, and (c) bows and quivers, and garlands. And the same picture, e.g. of water with lilies, might be appropriate, incongruous, or indifferent, according as it was applied to (a) a splash-cloth; (b) a chair-cloth; or (c) a table-cloth.

Some further illustrations of ideas and of methods are given, but it should be observed that they are offered, not as examples to be followed in all cases, but as instances which are near at hand to a dweller in London. There is much storiation in the exhibition buildings at Chicago, judging from the interesting description by Sir Henry Wood in the *English Illustrated Magazine*, and there is some in the details of the "Griffin" monument, but the former is distant and the latter is somewhat unworthy.

Section 6.—Appropriate Ideas.

Churches have always been places for the decoration of which the people brought of their best, and the decoration always had meaning. In fact, the stories were painted or carved for the purpose of teaching long before it was realised that they contributed towards the beauty of the whole. And each place in the church had its special set of subjects which would affect the worshipper more appropriately or more strongly there than in any other.

The portal by the sculptures reminded him of the Presence into which he was about to enter, and of the heavenly host which surrounded him. The baptistery, through the twelve apostles as witnesses to the faith, reminded him of the necessity to keep it pure. The nave, with its Old Testament or pre-Christian history, showed the times of preparation. The chancel, with the life of Christ, showed the times of revealing. The apsis, with the figure of the bidding Saviour, invited him to come. The cupola, with its display of the resurrection and triumph of the Saviour, assured him of blessedness. The wall of exit, with its judgment-scenes, warned him of responsibility. These are some of the ideas which were portrayed, but they were often varied, and a complete collection of the various schemes of storiation properly indexed would be of great use.

The windows, or eyes of the church, have always been a favoured place for storiation. In these are opportunities for the heavenly hierarchy, the angelic chorus, the Bible persons, the teachings of the Lord, the local hagiology, &c., and as they are often given as memorials some personal allusions are admissible.

The pulpit might be treated in consonance with Paul's advice:—"Preach the word . . . reprove, rebuke, exhort . . ." (2 Tim. iv. 2), or, as in that at Pisa, erected at the time when the preacher had become important, with the so-called "liberal arts"—rhetoric, arithmetic, geometry, music, astronomy, philosophy, grammar and dialectics—grouped round the central support as handmaids to the chief sister, theology.

For the choir, when separated from the church, a fine idea may be taken from the successive invocations of the canticle, "O all ye works of the Lord, bless ye the Lord: praise him and magnify him for ever," with its grand crescendo from the natural phenomena through the animals and man up to the spirits of just men made perfect, "O all ye works of the Lord, praise him and magnify him for ever." The "Te Deum" has been used here, but it should be observed that "Laudamus Te" is only in the preamble. The hymn is really a prayer, "We therefore pray thee help thy servants," and as such it would be more appropriate in the nave, where the people sit.

The local-cult of the patron deity, patron saint, or collegiate body has always been a strong power in storiation. Two instances from the Acropolis at Athens and the Vatican Palace at Rome may be given.

At Athens to the old Greek the great statue of Athene was of the guardian deity of his city and nation. She was the "Pro-machos," the fighter in front, like the great twin-brethren

of the Romans sung by Lord Macaulay. The mariner saw her helmet as he rounded the promontory, and felt she was also the guardian of himself as much as of his nation. The chryselephantine work of Phidias within the shrine was dedicated to the same goddess as "Victory-bringer," and all around the peplum, the pediments, the Panathenaic frieze, or the metopes told the stories of her or of those other deities about whom Miss Harrison has unravelled the myths in so delightful a manner.

At Rome were the headquarters of that vast ecclesiastical organisation which sought to formulate and spread the faith of the Galilean fishermen until it should be universally accepted. The head of this—the father of the faithful—was wont to receive the ambassadors from other states in the Sala Regia, and this was appropriately decorated to show the victories or triumphs of this Church over those who had differed from or opposed it. Thus the humiliation of the Emperor Henry IV. by the Pope Gregory VII. in 1077, the humiliation of the Emperor Frederick Barbarossa by the Pope Alexander III. in 1177, the return of the Pope Gregory XI. from a semi-subjection at Avignon to independence at Rome, 1377, the defeat of the Moors at Tunis, in 1553, the defeat of the Turks at Lepanto in 1571, the overthrow of the Huguenots at the massacre of St. Bartholomew's in 1572, each represented in a large picture, had a lesson to convey to those envoys from the foreigners, the moral of which was not far to seek. Two of the Stanze, which are approached from the Loggia of Raphael, on the same floor, have similar significant storiation: the Sala di Constantino shows the victory and the baptism of the first Christian emperor, and his address to his army, and also his donation (of the city of Rome) to one of the popes; the Sala d'Eliodoro shows the expulsion of Heliogabrus from the temple, the repulse of Attila from Rome by the Pope Leo I., the liberation of St. Peter and the conversion of the sceptical German priest; all of which would be food for thought on the part of opponents in demonstrating the venerability, the far-reaching power, and the benevolent intentions of the keepers of the faith.

Historic monuments must, of necessity, be storiated. The Trajan Column, at Rome, records the campaign in Dacia. The Vendôme Column, at Paris, records the campaigns in 1805. The arch at the top of the Champs Elysées, at Paris, records other Napoleonic campaigns up to and including the battle of Ligny in 1815. The ideas in these appear to have been generally a glorification of the destructive arts, with representations of incidents in the campaigns and of the spoils taken from their enemies.

Personal monuments are also often storiated. The ideas associated with monuments have been well classified by M. C. Daly under the three heads of:—Death, or those connected with the sense of the loss of a friend, of the silence of the tomb, and of the decay of the body; 'Glorification, or those connected with the personal appearance, with the virtues, the abilities or tastes; and Faith, or those connected with the teachings of religion and the belief in immortality.

The first of these deals with the old pagan "properties" of the inverted torch, the winding-sheet, and skull and crossed-bones.

The second informs us what particular virtues the deceased avowed, or wished to be thought to practise, as in the monument erected by Can Signorio della Scala for himself at Verona, after he had murdered his brother, which bristles with twelve statues of selected saints and virtues. A more worthy instance is the monument to the late Prince Consort in Hyde Park, which shows a portrait-statue, and alludes to his generous and discriminating encouragement of the arts and sciences and the international character of his sympathies. Personal tastes are shown in the fine frieze round University Hall, Gordon Square, to the memory of Henry Crabb Robinson, which collects, as in a conversazione, some of the men and women he knew. Another instance is seen in the memorial to Professor Fawcett, intended by Sir Henry Doulton for Vauxhall Park. There is a portrait-statue, with a figure of Victory behind; and in the panels of the pedestals are subjects appropriate to his character—Courage, Sympathy, Justice and Truth; and to his work—Good News, Bad News, a Woman Postal-clerk and India.

The third group of ideas is more consonant with our feelings in England, and instances will occur to everyone who gives attention to the subject. We English are reticent in feeling, and object to spend on sentiment that which may be better used for benevolence, and our climate is not favourable to hypæthral sculpture; but a walk through a cemetery is instructive.

Social life and civilisation often give ideas. Some of these are effectively worked in at some of the mairies or official centres of the districts of Paris. It is there that marriages are solemnised, that births are registered and that the conscription-lists are prepared of those on whom their country has claims for duty. The decoration in that of the thirteenth district by M. Boulanger is in a Classic style, and shows, on the four

walls, the four ideas of marriage, manhood, family-life, patriotism.

The Hôtel de Ville, which was destroyed during the second siege of Paris, contained, in the twenty-eight cove-panels of the great hall, a history of civilisation. As these were so complete in arrangement, a list of the subjects is here given with translations of the Latin mottoes:—1. Mother Nature—"The race of men arises." 2. Contest with Animals—"He fights against the wild beasts." 3. Shepherd life—"He holds the flocks in his hand." 4. Early metal-working—"He is pressed by various labours." 5. Spinning and building—"And they prepare clothes and houses." 6. Slaying a ram—"The gods are appeased with a sacrifice." 7. Cornfield—"The harvest enriching the husbandman." 8. Use of the vine—"He dissipates his troubles." 9. Music—"Songs harmonise with the lyre." 10. Astronomy—"He marks out the months and the stars." 11. Navigation—"He sends out ships on the sea." 12. Steam—"Force more intense from confinement." 13. Drama—"The two-faced mask weeps and laughs." 14. Metaphysics—"Man in intellect approaches deity." 15. Theology—"Instruction confirms faith." 16. Physics—"He seeks the causes of things." 17. Justice—"The goddess avenger of crimes." 18. Government—"Authority administering affairs well." 19. Geometry—"He measures everything in the world." 20. War—"Thus cruel wars assail." 21. History—"Clio singing of heroic deeds." 22. Medicine—"Diseases are cured by the physician's art." 23. Benevolence—"Charity is the nearest to God." 24. Oratory—"He rouses, he delights, he teaches." 25. Fine arts—"The three arts flourish as one." 26. Choral dance—"A dance to the sounds of a flute." 27. Agriculture—"Abundance scatters her fruit." 28. Fame—"She shows the way to the stars."

Textile objects—*e.g.* curtains, &c.—seem to invite allusions to Arachne the ambitious webweaver, Penelope the faithful wife, Dorcas the benevolent widow, or that unfortunate Lady of Shalot, among others.

Fireplaces invite the Plutonic cycle—Hephaistos and the Kuklopoi, King Alfred and the cakes, the "Golden Milestone" of Longfellow, and many other pleasant ideas to the home-loving Englishman.

Drinking-fountains need not always show us heathen nymphs, aquatic plants and dolphins, but may represent Abraham's messengers, David with the dearly procured water, the Samaritan well, Sir Philip Sidney, or the big sister of to-day lifting her little sister to have a drink, &c.

In thus interweaving the ideas with the decoration there will be a leading out of the mind by the associations, an interweaving of the interesting with the commonplace, a connecting of the lesser with the greater, a looking from the lower to the higher, which it is the privilege of poetry to add to life, and which storiatio adds to life's surroundings.

Section 7.—Incongruous Ideas.

The writer leaves this invidious portion of his subject unwritten.

Section 8.—Indifferent Ideas.

Some purposes of objects are so indefinite or uninteresting, and their associated ideas are so commonplace that these are passed over, and the storiatioist arranges some scheme which, though not suggesting the purpose, is yet not incongruous. An instance exists in the refreshment-room at the South Kensington Museum, where the beautiful panels by Mr. E. J. Poynter, R.A., show the twelve months and the four seasons, instead of such subjects as would, though appropriate to a grill-room, be commonplace and unelevating. On buildings and other objects which are indefinite, the following may be used:—Bible history always, local history and tradition often, and seasons and times generally.

Bible history is universal in every time and country, from those grand Byzantine gates and frontals onwards.

Local history instances are so plentiful that the "History of Manchester," by Mr. Madox Brown, in the Town Hall of that city; the "Chevy Chase," by Mr. W. B. Scott, at Wallington, in Northumberland; and the "Dragon of Wantley," by Mr. E. J. Poynter, at Wortley, need only be referred to.

Seasons and times are shown at South Kensington (as before mentioned).

The life of man is pathetically shown round the drums of the terra-cotta columns, by Godfrey Sykes, in front of the lecture-theatre at South Kensington. These have been so fully described by Mr. Pollen that no more need be said than to refer to his pamphlet on the subject.

Bestiaries are found in many places, Westminster chapter-house and the great hall at Padova being instances.

The literature of a country will furnish a perennial supply for this group, and all workers in decorative art feel a debt of gratitude to their brother artists in this for their inspiration.

Section 9.—Methods of Representation.

The methods by means of which the associated ideas are represented may be divided into groups as follows:—I. Imagination (including in that division all poetic and abstract

renderings). II. Reality (the representation of facts that have been or are). III. Epigraphy (not representation by picture but by word).

These groups are further subdivided, according as the methods are treated, as follows:—A. Mythically, including under this sub-group such as are (1) Supernatural; (2) not in ordinary experience; (3) not situated on our own globe; (4) involved in prehistoric obscurity; (5) the creation of poets and other "makers" of literature; and (6) the personifications of abstract ideas. B. Historically, *i.e.* in a "matter-of-fact" manner, with no meaning beyond that which is shown on the surface. C. Typically, *i.e.* such as are selected because they show the desired characteristic in a greater degree than others. D. Symbolically, *i.e.* such as have another or inner meaning, beside or beyond that which is apparent at first sight.

The complete list of methods is shown in the table, section 10. It should be here observed that it has not been always possible to classify logically, and some methods are grouped by affinity rather than by evolution.

Section 10.—Table of the Twenty-two Methods of Storiatio, by Means of which Ideas are Represented in the Decoration of Objects.

Storiatio.	I. Imagination	A. Mythic	a. Episode
			b. Personage
		D. Symbolic	c. Locality
			d. Attribute
	II. Reality	B. Historic	e. Device, &c.
			f. Heraldry
			g. Colour
			h. Event
		C. Typic	i. Person
			j. Place
		D. Symbolic	k. Occupation
			l. Worker
	III. Epigraphy	B. Historic	m. Scene
			n. Action, &c.
			o. Instrument
			p. Result
		D. Symbolic	q. Name (only) of event, person or place
			r. Word (only) for idea
			s. Date (only) of event
			t. Allegory, &c.
		D. Symbolic	u. Motto, &c.
			v. Letter, &c.

Section 11.—Details of Methods.

(a) The episode from myth or poetry is used when no suitable historic events can be found which will represent the desired idea. Instances of the mythic episode are seen in the "Orpheus singing" of the meeting-room frieze at our Society's house, &c.

(b) The personage, *i.e.* ideal portrait, includes such as are classified in the six divisions of group A in section 9, *e.g.* gods and goddesses, and the personification of the virtues, elements, planets, arts, sciences, &c. Instances are seen in the "Thames" of the meeting-room frieze, the "Fortitude," "Faith," "Charity" and "Justice" of the Gordon monument, the "Britannia" of the bronze coinage, the figures on Sir F. Leighton's Jubilee medal, &c.

(c) The locality, *i.e.* ideal view, includes such as are mentioned in section 9. Instances are seen in the "Elysium" (and "Hades") of the meeting-room frieze, &c.

(d) The attribute is the representation of an object which has been given up to a certain use, so that on seeing it the association of its user or usage arises in the memory. The garland of fruit, which was hung about the altar and the victim, as also the patera, vase and other sacerdotal appliances, when represented on the Roman temples, thus suggested their religious ritual. So also other objects, in consequence of their association with their particular gods and goddesses, came in time to suggest them; thus the eagle and thunderbolt of Jupiter, the lyre and laurel of Apollo, the aegis and owl of Minerva, &c. Afterwards to suggest the character or quality; thus the eagle for majesty, the laurel for peace, the owl for wisdom. When iconographic hagiology was crystallised in the Middle Ages, the representations of martyrs included the instruments which were associated with their martyrdom, *e.g.* the flaying-knife of Bartholomew, the wheel of Catherine, &c.; or with some other event, *e.g.* the keys of Peter, the serpent-chalice of John, the giant form of Christopher, &c.; or some companion, *e.g.* the stag of Hubert, the Assyrian monsters afterwards adapted from Ezekiel for the Evangelists, the pig of the Paduan saint, &c. The authorities on this subject are Durandus, Ripa, Didron, Mrs. Jameson, &c. Instances are seen in the scales and sword of Justice, the anchor of Hope, in many churches, &c.

(e) The device is the representation of a scene or object. Those on the shields of the "Seven Chiefs against Thebes" are minutely described by Aischulos (d. 456 B.C.); three of them were accompanied by mottoes, but these latter were not an integral part of the device.

The emblem was a short verse or motto, with an explanatory picture.

The impresa, as adopted by the Renaissance Italians, on undertaking any adventure, was a small picture, with an explanatory motto.

These two latter were so similar in their result—the picture and the motto—that the words came to be used synonymously.

The authorities on this subject are Alciati, Giovio, Ruscelli and Bargagli; followed by Cats, Quarles, Whitney, &c., down to our own venerable member, Mr. John Leighton. Instances are seen in the "Cave Canem" picture from Pompeii, many printers' marks, many examples of the recently-revived "Ex Libris" taste, &c.

(f) The heraldic shield is well known, and need not be particularised. Instances are seen in the royal shields on Westminster Bridge; those of the four kingdoms, together in quarters or separate, on the Houses of Parliament, &c.

The heraldic badge is (1) a charge taken from the shield; (2) the crest taken from the wreath, and used independently, e.g. the portcullis, feathers, &c.; or (3) objects taken not from bearings, but from any other convenient source, e.g. the sprigs of broom, rose, shamrock, &c., in the caps, or the knotted cord on the coats of retainers. Instances are seen in much of the carved enrichments of the Houses of Parliament.

(g) The symbolic colour was more used in the Middle Ages, though the revival of stained-glass during the last twenty-five years has drawn attention to it. Instances are given in chap. iii. of Professor F. Edward Hulme's interesting work on the "Principles of Ornament."

(h) The event is the representation of an actual occurrence in local or national history. Instances are seen in the "Victors at Olympia" of the meeting-room frieze; the Capture of Acre and the Forgiveness of the Chaluz archer in the Richard I. pedestal-panels in Palace Yard; the pictures from the Civil War in the Houses of Parliament, &c.

(i) The person, i.e. a known individual, shown by a portrait, is used singly or collectively. Instances are seen in the statues of artists in front of the Royal Academy, the mosaics round the Loan Court at South Kensington, &c., for the former treatment; and in the Crabb Robinson frieze at the University Hall, the podium of the Albert Monument, &c., for the latter.

(j) The place, i.e. the view of a particular town or country, is represented by inhabitants, as in the "Harmony welcoming the Nations" by Lameire; views, identifying it by well-marked natural surroundings, e.g. Naples by Vesuvius; or by well-known buildings, e.g. ancient Rome by the Coliseum, or modern Rome by St. Peter's; or by maps, e.g. in the Vatican gallery. Instances of this in London are not known to the writer.

(k) The occupation is represented by figures engaged in such as suggest the required idea. Instances are seen in the Industrial Arts of Peace and of War at South Kensington, the Arts and Sciences in the Albert Hall frieze, &c.

(l) The worker is not individualised as a portrait, but represented by the typical craftsman, clad in his working clothes, with his characteristic tools and specimens of his craft. Instances are seen in the figures typifying the chief livery companies of the City of London, in the Guildhall council chamber, &c.

(m) The scene, i.e. not any particular place, but a generalisation of climatic character, is represented by inhabitants, as in the actual place; the flora, e.g. the torrid, temperate and Arctic zones, by the palm and cactus, the oak and grass, the fir and moss; the fauna, e.g. the above by the lion and crocodile, the horse and otter, the white bear and seal. Instances of this in London are not known to the writer.

(n) The symbolic action is a dramatic rather than a graphic method of expression, and it is included here only to complete the classification. It is more used in the early stages of language than when they have become perfect and flexible means of communication. Instances are given in chap. ii. of Professor Hulme's book before mentioned.

(o) The instrument is such as is commonly used in any occupation, represented singly or in groups or trophies, e.g. the palette and brushes of painting, the telescope, retort, pulleys, &c., of other occupations, &c. Instances are seen in the trophies of tools hung on each side of the exhibition certificate, which is used as a frontispiece to the book, "Alfred Stevens and his Work," lately published.

(p) The result is the effect of the worker using his instruments to produce objects of art, &c., gather food, prepare shelter, capture arms, &c. Instances are seen in the paintings of silversmithery in the Loan Court at South Kensington, the reliefs of Indian and French arms on the Wellington Monument, &c.

(q) The name is used singly or in series, to represent event, person or place, when the position or means require such extreme simplicity. Instances are seen in the victory tablets round the Wellington Monument, the potters round the columns in the Ceramic Gallery at South Kensington, the potteries in frieze of same gallery, &c.

(r) The word for an idea, singly or in series, is used under

similar circumstances. Instances are seen in the words "Agriculture," "Commerce," &c., recording the branches of our Society's work in the meeting-room cove, &c.

(s) The date is useful, among other purposes, in recording the erection or completion of buildings, &c. Instances are seen in many public buildings in London, though not so universal as they should be.

(t) The allegory (including in this the parable and fable) is a literary rather than a graphic method of expression, and is included here only to complete the classification. Its function in literature is analogous to that of the symbol in art, i.e. to speak otherwise than by the mere primary meaning of the word or objects. Thus the "Pilgrim's Progress" is an allegory, and the "Catherine wheel" is a symbol.

(u) The motto (including in this the proverb, &c.) is used under similar circumstances as the other methods in this Group III. It is the most direct method of telling a story, but its interest is mainly literary, the artistic value depending on the decorative appearance (or otherwise) of the alphabetic characters, e.g. the Cufic letters in the Alhambra inscriptions. Instances are seen in the quotation from Spenser in the Octagon Room of the R.A., many sword-blades, the "Waste not, want not" of the bread platter, &c.

(v) The letter is the most simple, but it is not without its symbolic value. The monogram, in its earlier style of conjoined letters and its later style of interlaced ones (ciphers), has been very useful to the antiquary. The sign, conventionally degraded from picture-writing, used for the planets, zodiacal constellations, metals, alchemic decoctions, &c., has interest and value. The rebus, or substitution of representations of things for the proper name is of great help to the antiquary, and may be classified in this group. Instances are seen in the alpha and omega, the chi-rho, the ciphers on railway carriages, the chemist's show bottles, many old monasteries, &c.

Section 12.—Combination of Methods.

These methods have been sometimes combined; the attribute included in the representation of the personage, the person in the event, or the result (e.g. the trophy of game) with the instrument (the fowling-piece).

The mythic has been combined with the historic in some of our monuments, where the neptunes and sea-divinities support the English captains, the figures of fame crown the dying generals, or the skeletons are throwing darts or grasping at the fainting ladies.

Mythic personages have been also substituted in representing historic events. The crossing of the river Rhine, near Nimeguen, by the French king, Louis XIV., in his attempt to conquer a portion of Holland, took place in 1672. At the palace of Versailles, near Paris, this event is represented as follows. A man, presumably a portrait of the king, drives a chariot towards the left side of the picture, and threatens some figures there with a "thunderbolt"; the chariot is pushed from behind by Hercules, who is also striking with his club at an old man who sits on the ground with an overflowing urn, representing the river; Phœbus lights the chariot and Minerva guides the driver; while several winged females (in the air) are carrying chaplets and palm-leaves, and blowing trumpets. The whole is an instance of the treatment of reality as if it were imagination.

The series of the history of Maria de' Medici in the Louvre also shows the mixture of mythic personages with historic persons.

Section 13.—Overlapping in Representation.

Sometimes in an object the same person may occur twice. Thus in the Albert Monument, Michel Angelo is represented on the west side among the sculptors, and on the east side among the painters. Similarly, in the storiation of a church, if the Evangelists are separated from the Apostles, as is generally done, John and Matthew will be represented twice. So also with any person who is known in two characters.

Section 14.—Duplex Storiatio.

Double representation of the same idea is often found in Mediæval storiatio. Two books, published very early in the Middle Ages—the "Speculum Humanæ Salvationis" and the "Biblia Pauperum"—both give events from the New Testament history, each accompanied by other events in earlier history, with inscriptions, in what is known as the type and anti-type manner. They are very systematically worked out, showing the evidence of much time having been spent upon them; and these, which were doubtless handbooks to the artists of the time, accustomed people to pictures of the N.T. history with the earlier events represented in the backgrounds, and thereby made the storiatio more interesting.

An analogous treatment was followed in the Passion play at Ober Ammergau, during the Last Supper, when parallel scenes—of the Israelites gathering manna, and of Melchizedek offering bread and wine—were shown as *tableaux vivants* in the background, while explanatory words were chanted by the chorus.

Mr. Walter Crane, who has done so much for decoration and for artistic books in England, has adopted the above expedient very charmingly in his books—"Bluebeard," where behind the tempted wife with the key is shown, on a curtain, Eve with the Apple—"Puss in Boots," where at the marriage-feast is shown on the tapestry the other Cat that killed the Rat—"Frog Prince," where is shown on the table-cloth that other frog who would a wooing go—and in "Beauty and the Beast," where is shown, on the harpsichord, the Beasts charmed by Orpheus.

Section 15.—Available Spaces.

The number, size and proportion of the available spaces will always govern storiation, and of this the artist will be the best judge. In connection with this, an amusing instance of a space being too large is on record. It was stated that at Washington the painting of the grand historic frieze was brought to a standstill, as there was "not enough history to go round;" so, it was said at the time, they would have to wait until they had made some more history.

Section 16.—International Selection.

In the choice of persons or circumstances to illustrate any idea it is well to remember that human achievement belongs to no one country, and to select the most representative men and women regardless of nationality, thus making the idea truly international. The storiator that, while including some very second-rate French authors, could ignore Shakespeare and Milton, may be prompted by patriotic motives, but can only have a cramping effect on the intelligence of the inhabitants. It is pleasing to observe in the statues on Pennethorne's university building, that of twenty-two great men twelve are of other nations, from Plato and Galen to Cuvier and Linnæus; and so, also, in the great artists in the podium of the Albert Monument.

Section 17.—Didactic Use.

It is further useful in teaching. Paulinus, a bishop of Nola in the fifth century, as quoted in Didron (Bohn's edition), i. 4, and Geoffrey, a bishop of Auxerre in the eleventh century, as quoted *ibid.* i. 5, both give reasons which are interesting. Dante in the Purgatorio gives two instances of this didactic value. In Canto x. 28 to 51, a marble relief, showing humility towards superiors, by Mary; in line 52 we read further, "Un'altra storia nella roccia imposta," which shows humility towards equals, by David; and in line 70 we read he moves his feet to examine another "story," which shows humility towards inferiors, by Trajan. When we know that these sculptures are in that circle of the Purgatorio in which the sin of pride is punished, their appropriateness is apparent. In Canto xii. 25 to 72 we read of another marble showing instances of humbled pride, from Satan to the destruction of Troy; and he gives as the purpose of these stories, "Si che veggiate 'l vostro mal sentiero."

In the Palazzo Pubblico at Siena is a very interesting fresco showing the results of good and bad government, as in an antithetic parable. And as a last instance: that which is the most beautiful of all, may be seen the noble ruin of Lionardo's in that refectory where as often as the brothers met together, they were reminded to "do this in remembrance of Me."

Section 18.—Emotional Value.

It is found that pictures excite the multitude more than writings, partly by association and partly by being more quickly intelligible. The celebrated Italian, Napoleone Buonaparte, who was for some time Emperor of the French, gave an interesting instance of this when he was contemplating the invasion and conquest of England in 1805. He caused the Bayeux tapestry to be removed and exhibited at Paris, with a view to stimulate the passions of his subjects to attempt once more that conquest which the tapestry showed had been so easily accomplished before by William of Normandy. It is also related that Rienzi, the unfortunate political reformer of the fourteenth century, commenced his appeal to the people of Rome by exhibiting, in various public places, pictures of the degradation of the city, on which he made speeches.

Section 19.—Historical Value.

This is one of the most important branches of the subject, requiring much space to show even the mere outlines of the ground to be covered. The ideas which were chosen at various periods would form an interesting chapter of storiation, but it can be only mentioned in this paper. And now that archaeology is becoming, as an exact science, a worthy and necessary sister to history, this chapter is being written, and is yielding the most interesting and valuable results.

Section 20.—Necessary Knowledge.

In the preparation of a complete scheme the necessary knowledge will be seen to be great and wide. The storiator must know somewhat of many things, and also of the places where further knowledge is to be obtained. Hence the scheme has often been prepared, not by the artist who executed the work, but by the learned man (priest or scholar) who alone had

the grasp of the threads constituting the warp of their knowledge.

But the technical processes of artistic expression must always be considered, and some subjects, *e.g.* the Isolation of Oxygen, by Priestley; the Observation of the Transit of Venus, by Horrocks; the Identification of Lightning, by Franklin—which are easy in painting or relief, present great difficulty in statuary; so also other subjects, *e.g.* a fight for a standard or a football scrimmage, are more clearly understood in isolated statuary groups than in flat presentation. Therefore the artist who is to execute the work must be allowed (in consultation) to choose the exact treatment which inspires his mind. The choice of ideas is mainly literary, and that of methods mainly artistic. The storiator may select the ideas in consultation with the artist, and the artist should determine the method of representation in conjunction with the storiator.

In deciphering storiation much knowledge of the mythologies and histories of all peoples is also required. That of the Greeks and Romans has long been a part of school-curriculum; that of the Egyptians and Assyrians is a part of the equipment of archaeologists. That of the Hindoo nations has been condensed into an admirable handbook by Sir George Birdwood, which explains much of the Hindoo art that before was involved. Mr. James L. Bowes, in the notes at the end of his beautiful book—"Japanese Pottery" (Liverpool, 1890)—has done the same good service to the student of Japanese decoration. When the beginner learns how every plant and every attitude of the plant, as also every animal, has a symbolic meaning; that when one gentleman presents a picture of the pine-tree, bamboo, and plum-tree to another, he is wishing him good fortune and promising eternal friendship, he will judge the work for its value symbolically as well as æsthetically, and much that is puzzling in their distribution or arrangement now will be then made clear.

Section 21.—Reading the Storiation.

The purpose of a building may often be shown by its exterior decorative sculpture or mosaic. The classes of buildings may be determined generally by the architectural treatment of the roof and of the doors and windows. Thus museums, hospitals and factories all show their class; but the particular kind of object, disease and manufacture, is not shown by the exterior architecture, and can only be ascertained when sculpture assists by storiation.

It does for architecture that which words do for music. Music and architecture suggest, but words and storiation can also describe and inform. Hence the value of storiation when appropriate ideas are shown. An example is seen in the large building on the west side of Whitehall, which contains the Home and Foreign Offices. Each division of the building has seven spanrail panels, with low reliefs of mythic personages below, and six circular niches with busts of historic persons above.

In the Home Office the order is:—Spanrails—Law, Agriculture, Art, Science, Manufacture, Commerce, Literature. Niches—Gascoigne, Sinclair, Reynolds, Bacon, Watt, Smith. In the Foreign Office the order is:—Spanrails—Government, Europe, Asia, Africa, America, Australasia, Education. Niches—Elizabeth, Drake, Livingstone, Wilberforce, Franklin, Cook.

This is not the occasion to speak of the splendid sculptural qualities of the sitting figures in the spanrail panels, but the thoughtful manner in which the details are worked-out is well worthy the attention of the passer-by; and the introduction of the ideas of government and education seems to suggest that Great Britain realises its duties towards the foreign possessions. But the chief point is that the thoughtful spectator recognises the purpose of each division of the building.

It is pleasing in this connection to see the spectators round the Albert Monument purchasing the penny book which gives details of the persons represented; thus storiation is incentive to study, and gives interest in proportion to the knowledge of the beholder.

Section 22.—The Central Idea.

All pictures in monumental decoration should be arranged in connected series or sets. The impressiveness of a number increases, like the examples in natural philosophy, in square ratio. If we view one picture—say of John Howard visiting a lazaret-house—we may observe a man accompanied by a number of officials in a horrible place with a great quantity of human suffering; but if we contemplate a series of pictures—another of Elizabeth Fry seeking to reclaim the poor women in Newgate, and another of Florence Nightingale nursing the sick and wounded at Scutari, then we observe amid the varying circumstances of the Russian lazaretto of 1789, the English gaol of 1820, or the Turkish hospital of 1855, that there is one circumstance in which they all coincide—the benevolent and beneficent care of those who cannot care for themselves; and this central idea, which we trace in all, is the idea of the storiation. So also if observing representations or names of Moses, Joshua, David, then we would guess Hebrew worthies

for a school. If of David, Charles Martel, Alfred, then patriot kings, for a palace. If of Moses, Lykurgos, Justinian, Napoleon, then legislators for a Senate-house. If of Napoleon, Hannibal, Charlemagne, then generals who have crossed the Alps for a military school. If of Pliny, Cuvier, Linnæus, Owen, then naturalists for a natural history museum.

This connecting of different events or persons by the central idea, as if separate pearls on the same silk, or separate stones in the same setting, is an expedient which has often been used in our sister art of literature, and it is one of the great charms of storiation.

Section 23.—Some Sources.

In literature the sources for ideas are many and copious. The Bible is full of such, which are familiar and dear to all, and from its riches may be picked out such as are appropriate to all sorts and conditions of men. For the palace David and Hezekiah, for the judgment-hall Samuel and Gideon, for civic life there are no events or persons, but the Proverbs have been a rich store for epigraphy, and for the peasant Jacob and Ruth among others.

Other collections which appear almost to belong to humanity are Homer, Dante and the beautiful Sanscrit legends which have been presented to Western ears by Sir Edwin Arnold. Our own literature lies still nearer, and Chaucer, Spenser, Shakespeare, Swift and Burns are ever fresh. In our own time the poets have shown sympathy with our arts, and hence the works of such men as Browning, Rossetti, Tennyson, Longfellow and Morris are full of suggestions which have been used with avidity.

Contemporaneous events will also furnish circumstances and incidents which might be utilised to give a point of interest to our work. Work which sets down facts will increase in interest as time goes on, while that which merely gives us the old imaginations of fames, victories and cupids will soon cease to have any. And further it may be averred that there are saints and heroes around, probably as worthy as some that have been officially stamped, who (typically represented) would make our work more worthy of our age.

Section 24.—Cautions.

Errors may arise in place, kind and quantity. The place, when storiation is applied externally, may be on all buildings and on most other objects; but, when applied internally, it is more appreciated in public than in home life. On functional features it should be avoided. Thus the niches of a building (which are decorative) might contain statues of statesmen, &c., but for the telamones or supporting figures of a portico (which are functional) there should be no portraiture. A portico supported by two William Pitts, or by Pitt at one side and Fox at the other, would be absurd. On borders, as a general rule, it should be avoided, and should be reserved for panels and friezes.

The kind should not be too grave for its place. People do not like high tension in their homes; and when any storiation is introduced, it should be of a pleasing rather than harrowing character.

The quantity should not overpower the æsthetic nature of the decoration. It should be used rather as a "flavouring" than as the staple portion of the work, unless absolutely necessary by the function of the object.

Section 25.—Opportunities.

Storiation might be used much more than at present in England. It is not the whole nor the chief gospel of decorative art. It will not bring the millennium, but it will add meaning to beauty, as beauty was added to truth; and there are mosaic-workers and relief-sculptors in numbers who could execute all that is required to make our streets beautiful with colour and delightful with stories that should again be as books to poor men.

And indoors, in the house and the school, there are spaces which it is the aim of some well-known societies to fill, and among the latest of these are the efforts by Messrs. Selwyn Image, Heywood Sumner and others.

The writer thus pleads for more storiation—for more of these "histories and sermons which we can read without the trouble of turning over the leaves"—so that the surroundings and, with them, the lives of our land may be made more beautiful.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Institute of Architects was held on Monday evening, Mr. Macvicar Anderson, president, in the chair.

Royal Gold Medal.

The PRESIDENT announced that the Council had nominated Mr. Richard Morris Hunt, of New York, as a fitting person for Her Majesty to bestow the Royal Gold Medal on for his works as an architect. This had been announced by letter to

Mr. Hunt, who replied, expressing his gratification at the proposed honour.

Mr. WOODWARD said that the announcement made to Mr. Hunt would place members in an invidious position if they wished to nominate some other architect as recipient of the medal.

The PRESIDENT said it had evidently been the intention to find out whether Mr. Hunt would accept of the honour.

Colonel LENOX PRENDERGAST then read a paper, of which the following is an abstract:—

Cathedral of Palma.

Colonel Prendergast, in his introductory remarks, drew attention to the situation of the cathedral. It had been the ancient stronghold of the Moors, and on it, the site of their greatest mosque, stands the Christian church. The church was designed by Don Jayme of Aragon in 1232, after the rescue of Majorca from the Moors, which took place in 1229. The progress of the Moors in refinement and the arts had been hardly less brilliant and rapid than their progress in empire, and the architectural works undertaken by Don Jayme owed much of their delicacy and refinement to them. The enthusiasm of the Majorcans at their deliverance by the king of Aragon found expression by their founding the cathedral church of Palma.

The late Mr. Street, in his "Gothic Architecture in Spain," when speaking of St. Maria del Mar at Barcelona, claimed Palma Cathedral for its prototype. In the Governor's palace there were traces of Moorish work, especially in the foundations, but of Moorish architecture, as such, he could find none. The west front of the cathedral faced the entrance to the palace; the upper portion had only recently been completed, and though its design might have been worse, at a distance it did not jar with the rest of the building. The south front was, however, a marvellous creation in Santanny stone, and the effect singular in the extreme. The west door was considered a work of importance. The interior of the church, owing to the formation of the ground and the difference of space separating the arches between the north and south entrances and the remaining arches, appeared considerably larger than it really was. A bishop's throne occupied the centre of the east wall, and above rose the chapel of the Holy Trinity, standing many feet above the floor of the rest of the church. The finest work, architecturally, was that carried out by Bishop Pedro Cima about 1373; to that period also might be assigned the three easternmost bays of the nave; and at that time the effect of the interior of the cathedral must have been singularly fine as a specimen of Gothic architecture and fittings. Having given certain measurements of the columns, length and width of the church, the height of the central nave and side nave, Colonel Prendergast turned to the question of lighting. To a Spaniard the practice of admitting the sun anywhere was not to be entertained for an instant, but the solution of the strange blocking up of window tracery with stone was, to the author's mind, due to the enormous height of the church, which rendered it necessary to strengthen the supports; although, notwithstanding these precautions, several bays had had to be rebuilt. There was one other solution, viz. where the sun entered in force battalions of flies followed in its wake; but whatever the reason, the side-chapels were practically unlighted, and appeared to have been so from the first. Each chapel, of course, contained an altar, and behind the altarscreens were tombs of bishops with carving well worthy of study.

Turning to the ground-plan of the cathedral, the author described the uses to which the building was put, remarking that a knowledge of the purposes for which ancient buildings were erected was necessary if they were to be restored or appreciated. The plan was simple; three full-sized naves or aisles were placed side by side, the centre one having at its eastern extremity the sanctuary which contained the high altar. The choir was situated in the nave, two bays westward of the sanctuary arch, which was the usual Spanish arrangement, to explain which he described in detail the ceremonies of the Good Friday and Easter Day services in relation to the planning of the building, and pointing out the utility of the various parts of the church, said there could be little doubt that the architects thoroughly understood their business and for what they had to provide. The high altar, consecrated in 1346 by the seventh Bishop of Majorca, was of marble, and above it was a singularly fine "retablo" in sculpture, while several niches on each side contained figures of saints, all admirably carved in wood. In the treasury were several reliquaries of the best period of the architecture of the church. Of these the author mentioned a few, giving the approximate date of each. Those who had charge of the church never seemed to have relaxed their efforts to obtain what was most fitting, the best artists being apparently always engaged. Referring to the stability of the structure, which had at different periods to undergo a process of reconstruction in several directions, he quoted from a document concerning a commission of architects appointed to examine the mischief going on subsequent to the

completion of the building, and gave reliable Spanish authorities for the dates at which every portion of the work was executed. Going beyond the precincts of the cathedral, towards the head of the harbour, the author described a remarkable building erected as an "exchange" for the merchants of Palma, on land placed at their disposal in 1232; the building was not completed, however, until the middle of the fifteenth century. It consisted of a rectangular hall divided into three divisions by a double row of spiral columns, three on each side, which supported an arched and vaulted roof. Traceried windows and carved doorways of the fourteenth century combined to exhibit what appeared to him an altogether new experience of Gothic Pointed architecture as applied to civil buildings. A month had passed since his arrival before he visited the Lonja, or exchange, and during that period mischief of a serious kind had been done. The authorities had decided to renovate the interior. The walls were certainly darkened and stained by age, but there was a tone of colour on the flutes of the spiral columns and ribs of the vaulting which enhanced the effect to such an extent that to scrape off the patina seemed little short of sacrilege. Colonel Prendergast then described the injury which was being done, and quoted a letter written by himself, in which he referred to his membership of the Institute, to Mr. F. W. Mark, the British consul, and stated that, in consequence of their united efforts, and a local newspaper publishing his letter with a communication in similar terms from the consul, a strong feeling arose in the city against the work being continued. That reached the ears of the Government at Madrid, who stopped supplies, and before he left he had been gratified to know the scraping had ceased. With reference to the Casa Consistorial, another civil building at Palma, which the letter urged was worthy to be preserved with jealous care, it was, he was told, not to be pulled down, as had been contemplated, to make room for a feeble imitation of the Lonja, but that the roof was to be repaired and the building preserved.

Mr. WM. WHITE, F.S.A., proposed a vote of thanks to the Colonel for his paper.

Mr. O. HANSARD seconded.

Mr. BREWER and Mr. WEALE having made some remarks, the President put the vote to the meeting, and it was carried by acclamation.

Colonel PRENDERGAST briefly replied, and in doing so alluded to drawings shown and done by Mr. Rimmer and Mr. Prentice.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the ordinary meeting of this association in the Royal Institution, Mr. W. W. Robertson, president, in the chair, Mr. A. N. Paterson, M.A., A.R.I.B.A., of Glasgow, read a paper entitled "Colour as a Means of Architectural Expression." By way of introduction it was shown that the materials which the architect employs having each their colour value, his art is essentially chromatic, and that in consequence the study of colour is of first importance; that, nevertheless, it has been much neglected by architects, and that to this among other causes is due much of the monotony of present-day architecture. Architectural expression is regarded to be as much a matter of colour as of form, the term expression being used to indicate the individuality which differentiates one building from another, as well as the quality and character of the design in any one building. Three main lines of colour-study are laid down as being of most advantage to the architect. I. An examination of some of the principal laws of the science of chromatics, with the facts thereby to be discovered regarding the effect of colours according to their position and juxtaposition; a knowledge of these facts by itself will never produce fine results artistically, but they may be used by the artist as safe guides for the direction of the studies. The difference between light and pigments in relation to colour is noted, and the laws regarding complementaries, contrast, and small interval are explained and commented upon. The propositions regarding the use of colour laid down by the late Owen Jones in his "Grammar of Ornament" are examined with relation to past examples of architecture and analogy from nature. II. Attention is turned, secondly, to the colour qualities of our materials and the range of materials we have at our disposal, and it is found that there is no colour which has not its exponent in almost every material the architect makes use of. The various materials are passed in review, with reference to their effect from a colour point of view; stones, marble, of which it is thought more extended use might be made over small surfaces in external work; cement used as granolithic, rough cast and (as a form of small decoration) sgraffito; the various woods, singly and in combination, with a remark as to the greater use of inlays; bricks, tiles and terra-cotta; the metals, mosaic and other forms of internal and external decoration. With regard to these last, the more extended collaboration of artist craftsmen

is pleaded for as the only means of producing the finest results. III. In the third place, attention is directed to the use of colour in the architecture of the past. It is found that colour has always played an important part, and a rapid survey is made of pre-Classic days of Greek and Roman, Romanesque and Byzantine, Mauresque, Gothic and Renaissance architecture, with a more careful examination of some Italian examples illustrated—St. Mark's at Venice, with the Ca d'Oro and other palaces there, the churches of Sienna and Florence and the houses of Bologna and Perugia. The use of coloured materials and pigments in England and Scotland in past times is inquired into and illustrated. In conclusion, the tendency towards a more widespread use of colour in the present day is noted and welcomed, and particular reference is made to buildings in Edinburgh and Glasgow giving evidence of this. The counter influence of fog and smoke is discounted, as much of an architect's work lies in the country beyond their reach, while it is further contended that even if a colour effect in towns is limited to a few years' duration it is none the less worth being carried out, for that beauty is none the less beautiful because it is transient.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE usual monthly meeting was held in the studio of Mr. Wm. Guthrie, West George Street, who delivered a lecture on "Glass Staining." He introduced the subject by referring to the different varieties of glass employed by the glass-stainer, with an explanation of their qualities and appropriateness when used in different combinations. By means of a large number of examples he illustrated the practical execution of the work and the different methods of obtaining effective results. A short discussion followed, and at the close a hearty vote of thanks was awarded the lecturer.

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.

THE annual dinner of this Association was held at the Clarendon Hotel, the president, Mr. James W. Woodsend, in the chair, supported by the vice-president (Mr. George Fish), Mr. Councillor Wright, Messrs. T. Barlow, W. Bretnell, H. Buxton, T. Cuthbert, Dennett, jun., Gell, jun., H. Williamson, H. C. Gilbert, H. Gabbittas, E. Garton, J. Burton, A. Hinsley, Hodgson, jun., B. Keeling, E. Kent, F. Messom, G. A. Pillatt, A. Priestley, R. Simpson, J. G. Thomas, James Wright, F. Wartnaby, F. W. Whittaker, J. Whitehouse, Brownell, T. Skerritt, Attewell, J. Cooper and other gentlemen. Letters of regret for non-attendance had also been received by the secretary from several members.

The toast of "The Queen and Royal Family" having been loyally honoured, the vice-president (Mr. Fish) gave "The Town and Trade of Nottingham," coupling with it the name of Mr. Whitehouse, who suitably responded.

Mr. Messom next proposed "The Visitors," to which Mr. Brownell humorously replied.

Councillor Wright proposed "Success to the Nottingham Master Builders' Association," impressing upon the members the importance of being united for mutual protection.

Mr. Woodsend, in responding, said he quite agreed with the remarks of the previous speaker, and assured the members present that he was always ready and willing to do all he could to help on the best interests of members and the trade.

The following resolution was unanimously carried, with the request that the secretary would send copies to the railway companies serving the town:—"That this annual meeting of the Master Builders' Association of Nottingham, held Thursday, February 9, 1893, protests most strongly against the unwarrantable increase of railway rates to the building trades, and respectfully requests the various companies serving the town and district to bring the rates back to such levels as will be conducive to the preservation of the trades referred to."

At intervals during the evening songs and pianoforte solos were given by Messrs. Elsey, Gibson, Pym, Townsend, Wright and other gentlemen.

The usual votes of thanks were passed, to which Mr. Woodsend briefly replied. He said that their thanks were more especially due to the musical friends, who had done so much to make the evening so enjoyable and such a thorough success.

THE new Wesleyan church erected at Penryn, Cornwall, from the designs of Mr. J. Wm. Trounson, F.R.I.B.A., architect, Penzance, was opened by Dr. J. H. Rigg, D.D., president of the Wesleyan Methodist Conference, on Tuesday, the 14th inst.

BUILDING SOCIETIES.

AN abstract of the accounts furnished by building societies incorporated to Dec. 31, 1891, including Great Britain and Ireland, under the Building Societies Acts, was issued on Saturday. In the United Kingdom there are 2,767 of these societies, of which 170 were established in 1891. The 2,382 societies which make returns as to the number of their members have a total membership of 587,856, an average of 247 to each. The amount of their receipts during 1891 was 19,463,611*l.*; of their liabilities to the holders of shares 34,729,966*l.*, and to depositors and other creditors 14,911,514*l.*; 1,496 societies had balances of unappropriated profit amounting in all to 2,132,388*l.*; and the balance deficit of 495 societies reached the sum of 235,177*l.* The assets of the societies are stated as follows:—Balance due on mortgage securities (not including prospective interest), 47,703,054*l.*; amount invested in other securities and cash, 3,842,953*l.*

THE A. A. LYRIC CLUB CINDERELLA.

[BY A LADY CORRESPONDENT.]

ON Wednesday, February 8, this club held a most successful dance at the Portman Rooms, Baker Street, about 300 being present. The enjoyment of the dancers was greatly enhanced by a perfect floor, good music and pretty surroundings, and undoubtedly all spent a very pleasant evening, it being the generally expressed desire that the club might make the dance an annual institution.

The success of the evening was to a very large extent due to the exertions of the hon. secs. to the club, Messrs. Scott and Murray, and Mr. Theo Moore acting as M.C.s, also, the president, Mr. Ernest Rüntz, and the numerous stewards. All were unceasing in their efforts to promote the comfort of the guests. A pleasing feature of the evening's enjoyment was a song, "For all Eternity," very feelingly sung by Miss Jessie Hotine, accompanied by Mr. Theo Distin (Violin Obligato); at the Pianoforte was that old friend of the A. A. Lyric, Mr. C. Tenhof; Mr. Roland Henry also contributed a musical sketch, "Our Boarding House," in his well-known humorous style.

It would take up too much of your space to give the list of those present, but I was pleased to see Mr. H. O. Cresswell, as president of the A. A., applauding the efforts of the Lyric Club. Many A. A. men brought friends and beves of fair girls (architects' assistants upon this occasion only), for, after all, they could not well dispense with them, and we were quite up to the occasion, and only too ready to show they were dependent upon us for success just once in a way.

The dance came to an end punctually at twelve o'clock, and amidst "Good-nights" and congratulations, we heard the following:—"Hope they will give a dance next year. If so, let me have four with you instead of two, won't you?"

I must not forget to mention the excellent arrangements made for the club by the secretary of the Portman Rooms, and the capital band of the company under the direction of Mr. Russell.



The Future of Architecture.

SIR,—To the British art-student with an open mind the above phrase must seem absurd, for he must necessarily feel that there is no architecture, properly so-called, at the present time in England. Those who now claim that most honourable title are really very clever archæologists and excellent men of business, who, by travel, exploration and study of the ancient buildings of past ages—ages quite out of harmony with these present days, and therefore quite incapable of furnishing a mode of building suitable to our advanced civilisation—persuade the British public of these degenerate days that nothing better can be done than to ignominiously copy the picturesque but very debased architecture of the Jacobite, Georgian, or other remote period. But I feel sure they will excuse me saying they are not architects in the strict meaning of the term. To do something now exactly as it was done centuries ago is, in their opinion, to deserve praise, honour and reward; but, nevertheless, it does not make them architects. If the end and aim of archæology were nothing more than to give us history and beautifully-illustrated books there would be nothing for an admirer of architecture to complain of, but as we now see frightful Dutch gables, columns and pilasters resting upon brackets, keystones, and voids and other monstrosities in every street, it is time someone possessed of a little historical insight, the logical and philosophical spirit, and a love of art should no longer hesitate to protest and speak out.

Practical architecture, as all ante-Reformation monuments prove beyond doubt, was a progressive art in perfect harmony with the state of civilisation existing at the time they were built, and until architecture is again based upon the same principle we shall not know what English architecture really is, we shall make no real and vital progress in architecture, we shall never have what Italy, France, England and other glorious art-kingdoms once had, a national architecture at once beautiful and convenient and in harmony with our present advanced civilisation. If this be true—and I challenge anyone to prove the contrary—the British art-world has one of the most important and interesting problems before it awaiting settlement.

The last fifty years show the most wonderful advances in almost every branch of science, politics, commerce—in a word, in civilisation. Shall architecture alone stand still, nay, go backwards for its inspiration into the dark ages of ignorance and superstition? Surely not, and I—a sinner like all the rest, but penitent withal—therefore ask that something be done by those who have her real interest at heart to strike off her present unworthy bonds of restraint, that she may again have the healthy freedom she always possessed in the past, when she was worthy of her glorious destiny as "mother of all the arts." If this letter shall prove that there is sufficient public spirit in the profession to attempt a reform, there will be time enough to determine the particular ways and means to accomplish it—whether, in the first instance, it shall take the form of a deputation to the Government to appoint a commission to inquire and report on the formation of "a society for the encouragement of originality in architectural design," or some other measure to be determined upon at a meeting of those interested in this idea, need not be now discussed. Doubtless, sir, you will be willing to receive any preliminary proposals, and make them known to your numerous readers, and then steps can be taken accordingly, whereby it may be hoped that we may yet see in this nineteenth century the conception and birth of a national style of architecture thoroughly appreciated by the nation at large, and worthy of its admiration.

HERMES.

GENERAL.

M. Henri Mayeux has received the appointment of Professor of Decoration at the Ecole des Beaux-Arts, Paris, in succession to the late P. V. Galland.

Mr. A. Gilbert, R.A., was on Monday evening elected a member of the Institute of Painters in Water-Colours.

The Design for the proposed Opéra Comique in Paris will be obtained by competition, although some designs have already secured the approval of the authorities.

The Surveyors' Institution meet on Monday, the 20th, when a paper will be read by Mr. G. M. Freeman, entitled "The Arbitration Act, 1889."

The Royal Scottish Society of Painters in Water-Colours have held a meeting in Edinburgh, at which it was unanimously resolved to hold an open exhibition of water-colour paintings in the National Galleries on the Mound during the months of June and July next.

The "Manchester Guardian" says:—We are glad to learn from a German contemporary that Mrs. Schliemann has generously placed at Dr. Dörpfeld's disposal funds for a new campaign of excavations at Troy. Many questions yet remain unanswered, and the result of the new three months' work will be eagerly looked for. Dr. Dörpfeld starts in the middle of April.

The Council of the Manchester Academy of Fine Arts have arranged the press view of the Spring exhibition for Saturday, varnishing day for Monday, private view (with conversation in the evening) for Tuesday, the exhibition opening to the public on Wednesday, 22nd inst.

An Association of Painters and Sculptors who represent horses has been formed in Paris, and a selection of works by members will be shown at the next "Concours hippique."

Sir Thomas Deane, R.E.A., read a paper on ancient monuments in County Kerry, at the meeting of the Royal Irish Academy on Monday. He claimed that ancient monuments were more numerous in parts of Kerry than in any part of the United Kingdom. Among the most noticeable were the beehive cells, which in the neighbourhood of Dingle and Ventry literally covered a large district of country. Within recent years much more care had been taken of these monuments than in former times.

A Memorial of Heinz Toppler, the renowned burgomaster of Rothenburg, who lived in the fourteenth century, is to be erected in that town at a cost of over 1,500*l.*

The Architect.

THE WEEK.

THE death of Mr. JOHN PETTIE, R.A., on Tuesday, removes a painter of whom any country might be proud. He possessed some of the good fortune of his countrymen when he was able to secure a place on the line for the first picture he sent to the Academy in his twenty-first year, and to gain an Associateship in his twenty-seventh year. But his success did not spoil him, and as time went on his works improved. His style was a manly one, and he was not ashamed of a predilection for Scottish subjects. He was one of a band of students that owed much to ROBERT SCOTT LAUDER, a teacher who exercised great influence in Edinburgh. Mr. PETTIE could paint portraits of men in the modern sober garments, but he was more successful with heads when his sitters wore the armour or the plaids of a past age. He was essentially a painter of costume, but his figures never suggested models that bore clothes to which they were not accustomed. His *Sword and Dagger Fight*, *Terms to the Besieged*, *The Traitor*, *The Flag of Truce*, *The Defiance*, *Hunted Down*, and historical pictures like *The Disgrace of Cardinal Wolsey*, *The Duke of Monmouth before James II.* and *Bonnie Prince Charlie*, may be cited as examples of his skill in suggesting a story and in treating costume. That he was not deficient in humour was evident from his *Two Strings to Her Bow* and *Touchstone and Audrey*. As a colourist, he was every year increasing in power. Mr. PETTIE was born in Edinburgh in 1839, and he used to be taken for a strong man. Unfortunately an abscess was formed in his brain, and, although it was removed on Monday, the effects from it were fatal. His death will be deplored by many friends.

THE difference between Chancery and Common Law in respect of common interest has been exemplified in the Queen's Bench Division at the expense of a builder. Mr. TEMPLETON, of Hull, has suffered in his business, as he alleges, by the action of several of the local trade societies, and he sought to take an action against the presidents and secretaries for malicious conspiracy between themselves and members of the societies. He claimed 1,000*l.* damages and an injunction to restrain the defendants from injuring him. The trade unionists, when they received the writs, objected to having responsibility thrust on them on account of any corporate action. Lord COLERIDGE and Mr. Justice HAWKINS made it apparent from the first that they were opposed to the action; they considered it was only an effort to cast liability on the societies contrary to the Acts which exempted them from that sort of responsibility. It was held that common interest could not be shown, or that the officers and men had united to injure either the plaintiff or anybody else. According to one of the rules, "where there are numerous persons having the same interest in one cause or matter, one or more of such persons may sue or be sued, or may be authorised by the court or a judge to defend in such cause or matter on behalf of or for the benefit of all persons so interested." But no evidence was brought forward by Mr. TEMPLETON to suggest that any one of the officers inspired the attack upon him. It is not enough to be suspicious and to imagine that there are reasonable grounds for believing in the guilt of a party; the Courts must be furnished with other grounds. From the breakdown in the preliminaries of the action we imagine there is not much use in further proceedings. The trade unions know too well in what their safety consists, and the officers are about the last of the members that would run any risk for the cause.

ALTHOUGH the conditions were not revolutionary, there was opposition in England to the Act which places prehistoric structures under Government protection. With the experience of the advantage which the Act confers, it would still be difficult to pass a similar measure for the protection of structures of a later date. We must not therefore condemn the Indian family of Mudaliars, the priests and others who sought to obtain a very large sum of

money from the Indian Government as the price for refraining from actions that would imperil the Seven Pagodas of Mahabalipuram. FERGUSSON describes them as the raths or monolithic temples that stand on the seashore at Mahavellipore, and as examples of Dravidian rock-cut temples which "are as early, if not indeed earlier, than the fifth or sixth century, and are in reality the oldest examples of their class known, and the prototypes of the style." The granite in the neighbourhood is in demand for works in Madras, and it was apprehended that the temples would be injured during the blasting in the quarries. The Indian Government wished to secure the temples, and an official offered 190 rupees for them. The sums claimed amounted to about a million of rupees. Probably the monoliths were valued like carvings in ivory. When the case came before a district court the claims were reduced to 25,800 rupees for temples and works of art and 113,800 rupees for unquarried stone. The stone was estimated at 25,000,000 cubic feet. The judge declined to set any value on the temples, as it was not proved that an income was derived from them; but he considered the quarries were worth twenty-five years' purchase of an assumed rental value of 200 rupees a year, or 5,000 rupees. A sum of 124 rupees for some plots was not disputed. Costs were not awarded. All parties were dissatisfied, and the case was brought before the High Court of Madras. It was decided there also that the temples had not a market value. As regards the stone, the actual rent was taken as the basis—that was 140 rupees and fifteen years' purchase. The value was therefore reduced to 2,100 rupees. But the High Court considered that the quarrymen and others, to the number of forty-six, had claims which were legal. Taking the sum as 100 rupees each a year, ten years' purchase, or 46,000 rupees was allowed. The Land Acquisition Act of 1870 allowed 15 per cent. on the value for sales under similar conditions, and the Court also admitted it. The litigants appealed to the Judicial Committee of the Privy Council, and on Saturday judgment was given. It was decided that the district judge was right in basing the amount of damages on an assumed rental, and for giving twenty years' purchase to the zemindar. But the rights claimed by the forty-six quarrymen were not recognised. The original award of 5,124 rupees was allowed to stand, with the addition of 15 per cent. on account of enforced sales. Each side bears its costs. The case is remarkable as evidence of a desire on the part of the Indian Government to preserve the examples of native architecture, and as the zemindar and the villagers will hardly receive enough to pay law expenses, probably future claims for compensation will be less preposterous.

THE following recommendations concerning practice have been formalised by a special committee of the Philadelphia chapter of the American Institute of Architects:—Members may not consistently advocate unpaid competitions. It is the sense of this chapter that all competitions should be decided by a professional referee. A member endeavouring to establish a competition for the purpose of securing work already pledged to another architect will be expelled from the chapter. Members must make the conduct of competitions in all cases strictly in accordance with the conditions imposed, and insist that all competitors receive the same data and privileges as to time, &c. A member may not consistently make any offer of professional service to a party who has already retained another architect; such conduct renders the member liable to expulsion from the chapter. Professional courtesy requires that a member shall not give his services where another architect is already employed, without the approval of that other architect. The chapter reaffirms its adoption of the schedule of charges of the American Institute of Architects. A member may not consistently depart from the provisions of that schedule. A member offering his services for any less consideration than is embraced in that schedule for the purpose of securing work for which another architect is competing will be expelled from the chapter. Members may not consistently act in any way contrary to the expressed or implied policy and spirit of this organisation, membership in which carries with it the obligation of sustaining the best professional standards.

THE GRAFTON GALLERY.

THE opening of a new gallery in Grafton Street is a feat that is not without importance to other people besides the owners and staff. Apparently the exhibitions in it are to satisfy desires which the numerous galleries in London make more urgent. In a way the majority of the exhibitions of pictures are modelled on those of the Royal Academy. What is seen in them is adapted for visitors who love jog-trot ways and tolerate monotony as long as it is "safe." The Grosvenor Gallery for a time was a disturbing influence which seemed likely to become fascinating for those who used to believe that Burlington House could hold its own against all foreign devices. In a few years, however, the Grosvenor fell under the sway of a *clique*, and the exhibitions could not then be beneficial to English art. It was well they came to a close.

If we can judge from the first exhibition the Grafton Gallery will do more than compensate for the collapse of the Grosvenor. The latter was never without a sort of Mayfair refinement, and there was a preference for artists who might be considered decorative at *soirées* or even at garden parties. Accordingly there were pictures which were supposed to be inspired by the classics and writers who were unknown to the commonalty. The portraits might be illustrations of a peerage. The Grafton Gallery is also an aristocratic experiment, but the exhibition abounds with the works of men who are not ashamed of their Bohemianism, and who have to be sought in the quarters of foreign cities which are not recommended for inspection by the guide-books.

We may see in the Grafton Gallery many pictures which would never be painted if the artists gave much attention to the markets. It is not an exhibition for a man who buys for investment, and the dealers who control English patrons will probably declare it to be faddish. The painters, however, are likely to have realised the fate that was before them, and they may not expect to be more captivating in London than elsewhere. They have a right, however, to claim that attention for their works which is the due of all honest efforts to free art from limitations which are felt to be oppressive. If tested by the standard adopted by many prosperous artists, the majority of the paintings will no doubt appear full of errors; by some critics they may be supposed to be hardly entitled to be treated as works of art. But the men who produced them have also principles, and if there is error it arises from too faithful an adherence to what is accepted as the true logic of art.

There is no doubt, however, that opportunity is given to judge the pictures. The light does not obscure or soften defects, and not one work is too remote for scrutiny. It must be allowed that Messrs. WIMPERIS & ARBER, the architects, have, in spite of the difficulties of the site, set up excellent galleries, and by their efforts the study of pictures becomes less onerous than in most of the galleries in the district.

It is satisfactory to find there are some artists, whose authority is unquestionable, who have helped the new venture. Mr. WATTS, who is always generous towards experiments, has contributed a couple of figures, *Thetis* and *Daphne*, which show how well he can compel his hand to work on a small scale, and a vigorous head of a boy. Mr. ORCHARDSON'S *Mr. W. Gilbey* appears once more in public, and Mr. WHISTLER'S *Lady Meux* has a position which suggests its importance as a sort of canon (if such a possibility is allowable amidst so much independence). Mr. BOUGHTON, A.R.A., has a small landscape and a head of a girl seen in profile. He is one of those artists who might be expected to rejoice at having a gallery in which a forgetfulness of conventionalities is not culpable. Mr. ALBERT MOORE is a far abler artist than many an Academician, and his *Toilet* would be a welcome addition to any gallery. Foreigners will appreciate the skill which produces so much effect with a very few colours. Mr. DAVID MURRAY has three landscapes. The director of the Antwerp Academy, M. ALBRECHT DE VRIENDT, is represented by his *Pope Paul III. Contemplating the Portrait of Martin Luther*, which has been reproduced in *The Architect*. The *Dolores* of M. JOSEPH ISRAELS is a single figure, or rather bust, of a peasant woman in mourning, who, judging by the size of

the hands she is wringing, must have often toiled in the fields. It is impressive, like all the painter's works, but he might occasionally recognise that life is made up of other scenes besides those which precede and follow funerals. M. H. W. MESDAG has also lent one of his countless views at Scheveningen. Although it is pleasant to see such works as we have mentioned, they do not, with the one exception, appear related to the majority of the paintings. They serve, however, as foils, and may indicate how much has been lost as well as gained by the men who prefer the laws which every individual artist can make for himself.

It was right to place Mr. F. BRANGWYN'S *Buccaneers* near the entrance, for it may be considered as one of the paintings which impart character to the exhibition. The artist has hitherto painted his sea-pieces with a restricted palette, where dark blues were paramount. In this painting he has lavished reds. It shows a boat returning from an attack with a cargo of wounded ruffians. If in appearance they all resembled the besotted steersman, it is fortunate that so many of the heads are bent. The large work has the appearance of a first thought expressed in haste, and power is manifest throughout. Unlaboured as it looks, it has the realistic force of a chapter in DE FOE. Mr. BRANGWYN'S *Eve* will not appal those who are familiar with the modern representations of the subject. This red-haired woman is not dignified in appearance, and must be considered as deficient in moral character. The purple serpent that stretches along the tree could easily persuade so greedy a being. It is courageous to give a new version of a subject which so many artists have united in treating in a uniform manner, but the artist's invention might be employed with more advantage in interpreting other stories. The first name in the catalogue is Mr. ROBERT MCGREGOR'S (and Scotsmen have somehow secured a remarkably large share of the wall space), but his picture does not attract attention like the *Lobster Fisher* of Mr. COVENTRY, of Glasgow, which is a showy work. Mr. CAMERON makes his view of Amsterdam out of boats and barges, and has, therefore, failed to catch the spirit of the place. Mr. DAVID GOULD is forcible in his leafy June. Mr. WYLEY GRIER'S *Bereft*, a little girl taking a lamb from beside a dead sheep, which the crows are attending, is not without pathos, and the subdued colouring is in keeping with the scene. M. FRANZ VON LEEMPUTTEN'S *Return of a Pilgrimage* is a novel scene—a crowd of peasants coming along a flat road, their friends awaiting them in the foreground. It is no easy work to paint a white tea-cup; but M. GANDARA, in his *Le Thé*, shows not only cups but saucers, teapots, &c., so effectively that the character of the porcelain could almost be inferred from the painting. The lady who presides is only dimly seen, in order that the effect of the service may not be lessened. The picture is a *tour de force* which would not be out of place in the Wurtz Gallery at Brussels. M. GARI MELCHERS has two church scenes, *Faith* and *The Wedding*, in which some Dutch peasants in quaint costumes are seen assisting at services which appear to bring discomfort. M. LILJEFORS, of Upsala, is a believer in light blue, and contrives to use a good deal in his *Disturbed Repast* of a fox. M. SEGANTINI, of Milan, must possess some process of his own for producing rough soil, as otherwise the very elaborate effect which he obtains would need long and patient labour. In *Melancholy Time* we see a desolate shepherdess, who has only a cow to sympathise with her, and the uncultivated ground seems a fitting scene for such trouble. In the *Punishment of Luxury* his process no less serves for the dreary and arid region through which the erring are impelled.

In the Music Room there is much variety. Mr. G. HENRY, A.R.S.A., has *A Galloway Landscape*, that at a distance might be taken for a map in relief. M. HOECKER'S *Ave Maria* is the Annunciation, where the Blessed Virgin appears kneeling, and a cross of white light is seen in the sky. Mr. A. ROCHE, of Glasgow, has an *Idyll*, a scene near a river, that is decorative and original. Mr. STOTT'S *Pasturage by the Sandhills* has more reality as a landscape than his *Iseult* as a figure-piece, for the latter might be derived from a performance of WAGNER'S opera at a minor theatre. Miss NORDGREN'S *In the Woods*, *Lissadell*, *Sligo*, suggests an Irish trait, for the girl is walking barefoot, although she possesses boots, which she carries, in order to

save them for the town. M. ALFRED STEVENS has a remarkable *Storm Effect*, which will be a surprise, for he generally confines himself to pictures like his *Coquetterie*—a lady admiring herself in a mirror—which is, however, not one of his best specimens. Mr. LAIDLAY introduces plenty of detail in his *Tidal Marsh*, a subject that might not be supposed as adapted for such a treatment. The trees in Mr. E. A. WALTON'S *Pastoral* are vigorously handled, but they would be still more effective if the clouds were further distant from them. Mr. HORNEL'S *Summer* is very curious, a sort of Japanesque scene with a couple of ugly red-haired children. Mr. HARRINGTON MANN'S *Youth of Paris*, a boy piping for his goats and who is endowed with shapeless legs and big feet, hardly suggests a figure that was to become "graceful as a god." This is explicable when it is known the artist comes from Glasgow, for in the North anatomy does not appear to be a requisite study for a painter. M. VERHEYDEN has a capital open-air study, *A la Campagne*. M. RAFFAELLI'S *M. Clémenceau at an Election Meeting* fills a very big canvas, yet it might have been sketched at the meeting. The ugliness of the faces and figures is painfully true, and anyone who looks at the orator's arms need not wonder that so many Frenchmen were compelled to cast away their muskets in the last war. Mr. HENRY SIMPSON has hit on a pleasing subject in his *L'Amour Prisonnier*—a child entangled in a fishing-net who will not be extricated by some laughing girls. The draperies and backgrounds of M. LYBAERT'S two religious pictures might have been painted five centuries ago, but the faces reveal too much of modern consciousness. M. BESNARD'S first experiment of casting a bright yellow light over a lady's face was novel, but what is the advantage of repeating the effect, as in the portrait of Madame R. J.? M. HOLZEL'S *End of Summer* represents a girl at a table of an out-of-door restaurant; the lighting is admirable. Mr. ARTHUR MELVILLE'S portrait, a lady seated at a white piano in a room hung with Japanese paper, deserves attention for its originality and effectiveness.

M. FANTIN LATOUR'S *Zinias* and *Double Larkspurs* are masterpieces. The proximity of Mrs. STOKES'S *Passing Train*—a girl with a scarlet cloak looking over a hedge—does not affect the former. M. TATTEGRAIN'S *Entry of Louis XI. into Paris* was in the last Salon, and secured much attention. The Parisians appear in good humour, for they did not anticipate the cruelty of the king, or the influence of TRISTAN L'HERMITE. His Majesty has just passed a *tableau vivant* of the Crucifixion, and the characters gaze after him, while he is engaged in listening to syrens who stand up to their waists in a tank of water. The whole scene is vivid, but the horse on which the king is mounted is so wooden that the merit of the rest of the work is likely to be overlooked. Mr. LORIMER'S *Pleasant Labour*, a farmer filling a sack with potatoes, to the delight of a group of children, is worthy of a place in any exhibition, for it is a pleasure to look on so unaffected a piece. M. KHNOPFF'S *Samuel and the Witch of Endor* is very curious as a combination of black and yellow. Professor VON UHDE, in his *Lord, Abide with Us*, interprets the scene at Emmaus as if it happened to-day. CHRIST is like a poor monk, and the disciples are peasants. The Prince TROUBETSKOY shows ability in his portrait of Mr. Justice DAY, who appears without his crimson and ermine robe engaged in reading a newspaper. The face presented difficulties, which are overcome by the aid of vigorous light and shade. M. THAULOW'S *Pont Louis Philippe* is so thoroughly careful in all its parts, it might have been painted in days when Impressionism was unknown. M. ANKARCORNA'S *Norwegian Horses* are sculpturesque rather than animated. M. CHARLES MEUNIER paints colliers wheeling coals in one picture, and in the other shows as dismal a colliery village as could be discovered in the Midlands. Mr. R. B. NISBET'S *Dundee from the Fife Coast* is almost a monochrome, yet somehow it does not appear out of place in the gallery. Mr. W. GEETS represents an exhibition of marionettes before the young CHARLES V. in a style that is popular in Belgium, and the figures are ably characterised. A novelty in portraiture is commendable, but it is not likely that M. RYSELBERGHE'S plan will be often imitated. He places his subject in the dress-circle of a theatre, of which part the lady is the only occupant, although the rest of the house is crowded.

In the end gallery much will be found that is interesting. The Hon. JOHN COLLIER'S *Wood Nymph* is seen reclining on a tree over a lake. M. HANS HERMANN paints the *Fish Market of Amsterdam* so darkly that the red on the inside of a tub gives unusual gratification. M. MUHRMAN'S sombre *West Heath, Hampstead*, suggests that the artist believed the English climate could not be sunny. *The Interior*, by Professor KUHL, of Munich, depicts a workshop with several lathes; a man stands at one, and a woman is busy seated on the floor. It is a bright, sunny day, and trees are close to the window. It is a pleasant picture of labour. M. DEGAS is one of the leaders of the young painters of Paris. He has one sketch in crayons, *The Little Student*, which was hardly worth showing unless to suggest that the artist prepares for a picture in a rough and ready way. *The Absinthe* is as true to Paris life as the big picture of the political meeting. It shows a modern Parisian of the *voyou* class and his lady companion taking their pleasure sadly at the table of a wine-shop. It is more true than a photograph, for there is no posing of the pair. Mr. MARTIN HARDIE'S *My Heart is Sair* is as quiet and unpretentious as a work of the last century. M. CARRIÈRE BELLEUSE paints a *Ballerina* who is modest. Mr. CHARLES PEARSE is one of the most successful of the American painters in Paris, and his *I Have that Within which passeth Show*—a girl with a child—has the rare charm of being suggestive of something more than worldly affection. *The Terre Promise*—a crowd of children gazing eagerly through the glass door of a toyshop—will uphold M. LOBRICHON'S reputation as a painter of young folks.

Among all the landscapes the most important is *The Mill in the Valley*, by Mr. HUGHES STANTON. It shows a wide expanse of country that is of varied character, and the whole is treated with a breadth that does not allow any part to diminish the unity of the scene. The two works by M. GERVEX are not enough to explain the extent of his reputation as a painter. M. PAUL MAITLAND is modern enough, for he has painted a public-house at night, brilliantly "lit by a Sugg gas-lamp," and with much effect.

The Armenian Convent, Venice, from its hardness and dulness, must be an example of one of the early styles of Miss MONTALBA. Herr MATIEGZECK'S *The End of the Holidays*—two girls in a railway carriage—reveals that in Germany, as in England, young people can be bored by their outings. Mr. J. E. CHRISTIE is a painter who ought long since to have secured much more prominence in art. His works are never commonplace. His *Bogey Burn* represents two children near water which has become dyed by leaves and flowers. It is like a new version of the "Babes in the Wood." M. CHEVALIER TAYLOR, in his *Harvesters of the Sea*, presents a number of fisher-girls, everyone of them being in profile, with side views of the boats in the distance. Mr. LAVERY'S *Lord McLaren* is a very quiet, elderly judge in a black gown and a wig, seated amidst an abundance of books and papers; his *Mrs. Jan Hamilton* will probably secure more attention. *The Attrapade*, by M. FELICIEN ROPS, depicts an altercation between two over-dressed women on a staircase. It might have served for a design for a woodcut in one of the penny dreadfuls of Paris. M. ROLLS has a portrait of *M. Tirard*, which at the present time is likely to suggest a dangerously plausible gentleman. The paintings which are as lightly coloured as cartoons, by Mr. WELDEN HAWKINS, deserve as much attention as any work in the gallery. The outlines are most vigorous, and the heads are something more than portraits. Among the drawings on the screen the portraits in pencil by the Marchioness of GRANBY are worthy of Mr. G. RICHMOND.

There are a few pieces of sculpture on a small scale scattered through the rooms, the most remarkable being a head of *St. John the Baptist*, by M. RODIN. Taken as a whole it must be admitted that an attractive show has been prepared, and one that promises well for the future of the new venture. The collection has a claim to be accepted as inter-European, if not as international, for besides works by English and Scottish artists there are others from France, Germany, Italy, Sweden, Belgium and Holland. It is, therefore, possible to obtain a fairly accurate notion of the latest developments of the painter's art, especially as it is exemplified in non-official studios.

THE WINDOWS IN YORK CATHEDRAL.

FEW cities can boast of more extensive and important remains of painted glass than York. The examples extend over a period of nearly four centuries; but it is the almost unbroken series of glass paintings of the fourteenth and fifteenth centuries which renders this collection so interesting to the student. The greater portions of these specimens are in the Minster; and their value, as evidence of the state of the art at different periods, has been enhanced by Mr. Browne's laborious investigation of a vast mass of original documents relating to the building and adorning of the cathedral—which has enabled him to assign dates to most of the windows with remarkable precision. The earliest painted glass in the city—and probably the earliest specimen in England—is a portion of a Jesse in the second window from the west on the north side of the clerestory of the nave of the cathedral. It forms the upper subject in the westernmost lower light of this window. The date of the glass is about 1200; it is therefore much earlier than any of the Early English glass at Canterbury Cathedral, to which a date cannot be assigned much earlier than the middle of the thirteenth century. A coloured engraving of this very curious example is given in plate 123 of Mr. Browne's history. Much Early English glass, varying in date from the beginning to the middle of the thirteenth century, has been employed to fill the wheel of tracery in the head of the last-mentioned window, as well as the wheels in the tracery of the five next clerestory windows. The upper tier of subjects in the lower lights of the fifth and seventh windows, counting from the west on the north side of this clerestory, are also Early English. An Early English subject is inserted in one of the lower lights of the sixth clerestory window, counting from the west. The wheels in the tracery of all but three of the clerestory windows on the south side of the nave are likewise filled with Early English glass, and Early English glass-paintings are also to be found amongst the subjects in their lower lights. Coloured engravings of some of this glass are given by Mr. Browne. One plate, of great value to the antiquary, represents a series of borders, from the commencement to the middle of the thirteenth century.

The next glass in order of date is that in the Five Sisters, which beautiful pattern windows are of the latter half of the thirteenth century. It is hardly necessary to observe that the glazing of the five lancet windows above the Five Sisters is modern. Some glass of the same character and date as that in the Five Sisters has been inserted in the tracery of the second window from the door in the vestibule leading to the chapter-house. Of the same character are the remains of an Early English window of the latter half of the thirteenth century inserted in two Decorated windows on the north side of the church of St. Denis, or Dionis, in Walmgate.

The glass in the chapter-house and the vestibule leading into it is all of the time of Edward II., and is an extremely beautiful specimen of early Decorated work. One window of the chapter-house, that opposite the entrance, is a restoration by Messrs. Barnett & Sons, of York. It has been carefully executed, and if it does not produce so satisfactory an effect as the original windows, this arises not from the fault of the artist, but from the impossibility of procuring at the present day a material similar in texture to the glass of the fourteenth century.

The next glass in order of date is that in the cathedral, in its clerestory and aisles. This glass is all of the time of Edward III. The contract for glazing the great west window is dated 1330—and none of the glass is probably later than 1350.

The general arrangement and execution of the designs throughout this part of the building are well worthy of notice, as evincing the attention paid by our ancestors to general effects in these matters. The west windows of the nave and aisles, of which distant views may be obtained, have their lower lights filled with large figures and canopies, while the windows of the aisles, with but one exception, are adorned with paintings of a more complicated character, and better calculated for a closer inspection. Much of the plain geometrical glazing in the clerestory windows is original, and, like that in a similar position in Cologne Cathedral, affords a proof that the ancient glass-painters did not consider themselves bound to finish patterns destined to occupy a distant position as highly as those placed nearer the eye. Some decorated glass of the same character and date as that in the nave has been placed in the first window from the west of the south aisle of the choir. The second and third clerestory windows from the east on the south side of the choir contain similar glass, which it is likely has been removed thither from one or other of the two flank side windows of the north and south aisles of the nave.

Many of the churches in York possess good decorated glass in their windows, in particular the east window of the north aisle of All Saints, North Street, and the westernmost window of the north aisle of St. Martin's cum Gregory. There are also the remains of a decorated Jesse in St. Dene's or St. Dione's

Church, and some very perfect decorated designs in the first and second windows from the east on the north side of that building.

The earliest Perpendicular glass in the cathedral is contained in the third window from the east in the south aisle of the choir, in the third and fourth windows from the east in the north clerestory of the choir, and in the fourth clerestory window from the east on the opposite side of the choir. These windows are of the latter part of the fourteenth century. There is also an early Perpendicular Jesse in the third window from the west in the south aisle of the choir. The date of the east window of the choir is well known—a contract for glazing it in three years was made in 1404. This window is one of the best executed ever seen. The beauty of the figures, however, cannot be fully appreciated without inspecting them closely from the gallery near the window. The other windows of the choir aisles, eastward of the small eastern transepts, as well as the glass in the lancet windows on the east side of the great western transepts, appear to be likewise of the time of Henry IV. All the rest of the glass in the choir is of the reign of Henry V. and Henry VI., the greater portion being of the latter reign. The chief peculiarity in these windows is that the white glass which enters so largely into their composition is, generally speaking, less green in tint than usual. It appears from the Fabric Rolls that the white glass is of English manufacture, which circumstance may serve to account for its whiteness. There is some very good glass of the time of Henry VI. in the east and other windows of All Saints Church, in North Street; the east window has not been improved by the restorations, which appear to have been made in ignorance of the fundamental principles of the Perpendicular style of glass-painting. St. Martin's Church, Coney Street, contains much painted glass of the time of Henry VI. of good character, and valuable as affording an example of a general arrangement of designs throughout an entire building. Some glass of the reign of Henry VII. has been inserted in the four upper south windows of the great west transept of the cathedral. The heads of some if not of all of the figures are restorations. A very beautiful cinque-cento glass-painting, of the latter half of the sixteenth century, has been inserted in the window next the east of the south aisle of the choir. It was presented to the cathedral by Lord Carlisle in 1804, and was brought from a church at Rouen. The design is evidently taken from a painting of Baroccio (who died in 1612, aged eighty-four), but the colouring and execution have been varied to suit the nature of the material employed. From the column-like arrangement of the groups, as well as the actual division-lines of the glass, it may be inferred that this work was originally painted for a four-light window; and it affords a proof that it is not impossible to unite the drawing and colouring of an advanced period of art to the true practice of glass-painting. In the windows by Peckitt, at the south end of the great west transept, the principles of painting upon glass and painting upon canvas are confounded together: in attempting to imitate the depth of an oil-painting by shadows alone he has simply produced opacity, than which no greater fault can be committed in glass-painting. A correct and properly-detailed account of the glass in the cathedral alone would be a most valuable addition to our archaeological publications. Many of the windows in the cathedral are histories in themselves, and contain information which can hardly be collected elsewhere.

ARCHITECTS' FEES.

ON Tuesday the case *Burr v. Ridout* was heard before the Lord Chief Justice and a special jury. The plaintiff claimed 450*l.* as fees and charges in connection with the preparation of plans for two houses. The defendant's plea was that the plans were not used, as they did not correspond with the instructions given, and represented buildings which were too expensive. The sum of 110*l.* was paid into court as a reasonable remuneration for plaintiff's services. Plaintiff denied that in the instructions he was limited to the amount specified.

It appeared that the defendant, who was an estate agent and speculator in buildings, entered into an agreement to build two houses on the Cadogan Estate Chelsea, at a cost of 4,000*l.*, the buildings to consist of shops, with "flats" above as residences. His intention was to erect the buildings at a cost of 4,000*l.* In August, 1891, he asked plaintiff about the sum that would be charged for preparing plans and superintending the works. Plaintiff stated that his fees would be according to the scale of charges of the Royal Institute of British Architects. According to plaintiff the terms were agreed to, and he was directed to prepare plans. When the tenders were sent in it was found that the lowest amounted to 7,067*l.* The defendant declared that he could not expend so much money, and a tender was not accepted. Afterwards the buildings were erected at a cost of 3,500*l.* from plans by another architect.

Mr. Witt, Q.C., for the plaintiff, in his address having stated that the terms, as fixed by the Royal Institute of British Architects in cases where the work was broken off, would be $2\frac{1}{2}$ per cent. on the estimated cost, and if the work went on to the receiving tenders the charge would be $\frac{1}{2}$ per cent. further on the lowest tender,

Lord Coleridge said he would not allow the Institute to dictate to juries what sum was to be paid for work not done.

Mr. Witt said his case was that these terms had been agreed upon, the defendant having been informed that the rules of the Institute would apply.

Lord Coleridge said that unless there was clear proof that they were part of the contract, he should treat the rules of the Institute as mere waste paper.

Mr. Burr stated that he handed to the defendant the rules of the Institute, and the defendant accepted and employed him on these terms. He submitted "sketch drawings" to the defendant, who desired some alterations which would increase the expense. Plaintiff's clerk took out the cubic contents at 116,870 cubic feet, and at 6*d.* per foot the expense would be 4,000*l.* But at that rate the building would be of the plainest possible nature, and defendant said the expense ought to be 9*d.* or 10*d.* per cubic foot. He was informed that meant an expense of between 6,000*l.* and 7,000*l.* The plans having been approved in the estate office, tenders were advertised for, and defendant wrote for the "quantities." The lowest tender was 7,560*l.*, including architects' fees, &c., but excluding them it would be 7,067*l.* The defendant said that was more than he could undertake. He asked plaintiff to send in his account, and he wrote that "the price I had in my mind was 4,500*l.*, including architects' fees, so that there must be a great reduction." Afterwards he wrote that the drawings, &c., were unfit for a speculative builder, the plans being too expensive, and the materials too costly; he also complained of delay, to which the plaintiff replied that they had all been explained to him and that he had approved of them. Plaintiff charged for preparing drawings and specifications, &c., 3 per cent. on 7,067*l.* (212*l.*), and for preparing a bill of quantities 2 per cent. on lowest tender (141*l.*). There was a charge of about 50*l.* for lithographing quantities, &c., 21*l.* for preparing specification of alterations, 10*l.* for surveying site, and some lesser items brought the amount to 450*l.*

In cross-examination Mr. Burr said he was not informed that the expense must not exceed 4,000*l.* The defendant's arrangement with Earl Cadogan was to expend 4,000*l.*, and he had calculated for advances to the amount of 3,500*l.* If he said to defendant that the buildings could be erected for 4,000*l.* that was only an estimate. His clerk estimated the cubic feet at 116,870, and at 9*d.* per foot the amount would be 4,382*l.* Defendant had asked him to reduce the commission for "quantities" to $1\frac{1}{2}$ per cent., but he did not agree to the proposal.

Mr. Kemp, Q.C., maintained that the rules of the Institute did not contain one which was in terms applicable to the case which had occurred—that of the work being thrown up before it was begun. The question therefore would be what was reasonable in such a case. The defendant, who was described as a "speculative builder," and to whom the cost would be vital, had contemplated only an expense of 4,000*l.* The plaintiff was employed to prepare plans and drawings for such an expense, whereas he had prepared plans that would involve an expense of over 7,000*l.*, besides his own charges, which the defendant could not afford, and so the plans were useless.

The defendant said that 4,000*l.* was fixed from the first; that was at 8*d.* per cubic foot, which would come to 4,030*l.* He sent the plaintiff a copy of his building agreement with Lord Cadogan, which was to erect two houses and expend 4,000*l.* The lowest tender was 7,650*l.* The plaintiff said, "We must cut down tremendously," but defendant declared it was not a case for "cutting down." There was a difference of thousands of pounds, and he came to the conclusion that as the whole expense was so excessive he must begin *de novo*, and wrote to the plaintiff to tell him so. He made no use of the plaintiff's plans and drawings. He denied any material alterations in the plans prepared by the plaintiff which would increase the expense.

Lord Coleridge: Your case is that, from first to last, you limited him to an expense of 4,000*l.*?—Yes.

Lord Coleridge: And that on his plans the buildings would cost nearly 8,000*l.*—between 7,000*l.* and 8,000*l.*?—Yes.

Lord Coleridge: That is the case put shortly, "I ordered plans for a cost of 4,000*l.*, and you sent me plans for an expenditure of nearly 8,000*l.*"

The Defendant: Just so. That is my case. I desired no alterations which would increase the expense, which I put at 4,000*l.*

The defendant, in cross-examination, denied making any alterations which would involve additional expense. As to the electric light, all he had authorised was putting up the wires in one house at an expense of 40*l.* or 50*l.* He had desired the work to be done well, but not luxuriously. From the first he

had fixed 8*d.* per cubic foot, which would come to a little over 4,000*l.*

In re-examination he said the work had been done under the new architect, and well done, for 3,500*l.*

Counsel for the plaintiff and defendant addressed the jury.

Lord Coleridge said that the defence rested on this—that the expense of the building was not to exceed 4,000*l.*, which was all the defendant was bound to expend. It was not likely he would expend 8,000*l.*; his case was that the plaintiff, his architect, knew this. If the employment was to prepare plans for a building which could be erected for 4,000*l.*, plans which would involve an expense of nearly 8,000*l.* were certainly entirely different from what was desired. The case for the plaintiff was that the defendant saw the plans and approved of them, and had alterations made in them. Undoubtedly architects did not strictly keep within their employers' limit of expenditure, and on the other hand, the employer was easily induced to countenance an increase of expense here and there upon such pleas as architects knew how to urge. In the present case, although the tenders came near 8,000*l.*, the defendant's letters did not look like a total repudiation. Could the defendant then entirely repudiate the employment of the plaintiff? If not, then it became a question what was reasonable, and that was for the jury to consider. It was said that the Institute of Architects had settled certain charges on the estimated amount of expenditure. But a commission upon expenditure incurred was open to the gravest possible objection. His lordship referred to a case of a gentleman who wished to build a house and was willing to pay 50,000*l.* upon it. His architect prepared plans for one to cost 150,000*l.*, and said, "Well, you may or may not build it, but in any case you must pay me commission upon 150,000*l.*, for the Institute of Architects say so." He confessed his legal soul fired at it; he hoped that no British jury would ever yield to what was a most unjustifiable attempt by a body of men to increase their own emolument. He told them distinctly, that unless they were satisfied the defendant had agreed to pay the percentage, he was not liable to pay it.

The jury found for the plaintiff for 200*l.*, including the sum paid into court.

HEDINGHAM CASTLE, ESSEX.

IT is expected that Hedingham Castle, in north Essex, will shortly come into the market. Little of the ancient castle now remains except the Norman keep, a square building of the same type as the Tower of London and Rochester Castle. It consists of five storeys, and is upwards of 100 feet in height, so that it is a conspicuous object for some miles round. Its walls are from 10 feet to 12 feet thick, and its great hall, on the fourth storey, is still fairly complete. The grooves for the portcullis in the great gate on the western side of the keep are there, but the portcullis itself is destroyed. It is said that Queen Matilda, wife of King Stephen, died at Hedingham. In 1216 the castle was captured by King John from Robert de Vere, third Earl of Oxford, and in the following year it was surrendered to the Dauphin Louis of France, though soon after regained by the Earl of Pembroke for the young King Edward I. The castle remained in the occupation of the Vere family down to the failure of their line and the extinction of the earldom in 1655. The park and surrounding estate extend to about 2,000 acres. The estate itself passed to the Hoghtons or De Hoghtons through the Ashhursts, who purchased it from the representatives of the Veres, and it was by his marriage with the heiress of the Ashhursts that it was acquired in 1783 by Lewis Majendie, great-grandfather of the present owner.

TESSERÆ.

Saracenic Buildings.

THE Saracenic architects worked under conditions that excluded from their use the noblest elements of beauty. But they so employed the materials allowed to them as to produce a style that needs little indulgence on the grounds of its limitations in judging of its merits. It does not possess the highest qualities of architecture, which, indeed, cannot be attained to without the sources of sublimity and beauty opened up by the higher arts; its pointed domes and minarets do not carry up the soul to the empyreal heights, penetrated by the spirit of fretted vault and spire, exploring, as it seems to be, the "veiled infinity" beyond. But this is no dispraise of it, as it cannot be blamed for wanting what is never aimed at—what the religion of Mohammed, which was the great animating principle of the art, did not and could not inspire. It was not the architecture of holiness, but of pleasure, and though applied to mosques it was essentially a palatial style; it was the style

of palaces, of fountains, and of bowers, designed to mingle with and reflect the hues of everything lovely around it in nature, but to breathe nothing higher, even in the mosque; for the heaven of the Mussulman was but an idealisation of earth—a belief with which palaces and temples and tombs are fully in harmony. The religion of Islam involves something purer and higher than this for those capable of receiving it; but the popular notion of it is the one that inspired the Saracenic style, which was modelled in a purely terrestrial mould, the architecture of refined physical enjoyment, in unison with and thrilled with the sentiment of all that is delicious and beautiful on earth. The qualities sought by the Saracenic architects were exquisite elegance and grace of form, combined with minuteness and gorgeous richness of decoration; and in these qualities their architecture may almost be said to be perfect. In some of its branches it seems the very quintessence of richness and elegance; a style made up of graces—the poetry without the prose of architecture, in which all that is most pleasing and agreeable in structural art is brought together to produce the most romantic and fairy-like buildings in the world. If it indicates the predominance of fancy and feeling over judgment, there is no lack evinced of the latter in carrying out consistently the architecture of fancy and feeling which was aimed at, and giving perfection to the style, which approves itself the work of an intellectual as well as of a graceful people.

The Monuments of Mary and Elizabeth at Westminster.

Lofty, highly-enriched canopies formed a striking feature in the early monuments of the Gothic period. The same protecting roof or shrine is found in the monumental design of the post-Medieval time, and equally exhibiting a great quantity and variety of decoration. Colour, gilding, inlaid marbles, armorial emblazonment, scrolls, were profusely employed, as in the same class of design in the fourteenth and fifteenth centuries; but though there is quite as much meaning in the lozenges, twisted columns, urns and other ornaments in these monuments as in crockets, finials, cusps, trefoils and the other fanciful devices of the Gothic canopies, the latter were part of, and in harmony with, the architecture with which they were associated, which the ponderous vagaries of the sixteenth and seventeenth centuries were not. This, independently of other circumstances, constitutes the great difference between the two, and it must be admitted that, in an art point of view, the latter offer no compensating qualities. Two monuments in Westminster Abbey of great historical interest at once offer themselves in illustration of these remarks. They are the tombs of Mary Queen of Scots and of Elizabeth Queen of England. The former stands in the centre of the south aisle of Henry VII.'s chapel; that of the English queen in the north aisle. As in the monuments of the earlier style the effigies of these princesses form the main subject of the design. The inferior character of the sculpture generally is at once evident. Mary is represented in full dress, with her hands raised and pressed together, as if in prayer. The dress is elaborately worked, but is wanting in true artistic treatment, the folds not falling gracefully, but composed in heavy and straight lines, as in a standing figure, and then gathered in unseemly confusion at the feet. The hands have suffered injury, some of the fingers being broken off, but they are small and elegant in form, and the face, young and having a gentle expression, is of a pleasing character. The architectural portions are cumbersome, and every species of decoration that could be crowded into the design is lavishly introduced. The monument of Queen Elizabeth is not on quite so large a scale as that of Queen Mary, but it is composed on the same principle, exhibiting profuse and cumbersome ornamentation totally devoid of taste. The effigy surmounts an elevated table tomb. The Queen is in royal costume, with a small crown on her head. In her left hand she holds a globe, in the right a sceptre. The drapery is in large quantity, ill designed, and, like that of Queen Mary, stands up stiffly instead of falling over to the ground. The order, if it can be so called, of the architecture of these two monuments is Corinthian, and therefore entirely out of harmony with this beautiful chapel of a most enriched character of Perpendicular Gothic. This, however, must be a difficulty with regard to all works of later date that are to be placed in older erections. Unless the style of the architecture be imitated, the more modern works must always appear anomalous. Yet the mere copying, in part, of an older style deprives works of anything like a character consistent with their own date. They lose all contemporary distinction, while they are no trustworthy authority of the style they imitate. A modern statue represented recumbent and in prayer is as fitting a type of a Christian in the present day as it was five centuries ago; but placing such a figure under a Gothic canopy, with all the accessories that mark the peculiar art of a particular and past age of architecture, though it may be very like the older work

and very pretty, is, after all, incongruous. The statue expresses a sentiment, and a beautiful because a true one, but copying the architecture of another age is an anachronism. Every work of art should be truthful, and one of the most valuable recommendations of art is its power to illustrate its own age. If the age has no distinctive expression in its architecture, the difficulty is only increased, for then there can be no real or original design. It must be factitious and borrowed.

Gothic v. Classic Churches.

Most men of education have from their earliest years associated the idea of a church with something of Gothic decoration; and the image of the first well-remembered parish church which rises to conjure up thoughts of tenderness and reverence in the midst of all the sorrow and turmoil of after life, is characterised by a tower or a spire or battlemented porch. Our majestic cathedrals, with one noble exception, are all Gothic, and the almost universal prevalence of this style in our country has secured for it the suffrage of custom, an influence so powerful that Sir Joshua Reynolds is tempted to resolve into it all our perceptions of beauty. For these reasons it may be assumed, in spite of past and possible future fluctuations of the public taste, that Gothic with its varieties will permanently maintain its ground as the ecclesiastical architecture of this country. But not content with this concession, many seem so far to mistake their own arbitrary associations of ideas for the common instincts of humanity as to imagine that this popular style has by inherent qualities of its own some necessary affinity with religious impressions. Many a youth whose awakening taste has been first touched by the glories of the Gothic style is led, in defiance of fact and in ignorance of history, to dream of some mysterious union between piety and genius, of some imaginary period when "Christian art," advancing to perfection, walked hand in hand with holiness of life and purity of doctrine, till at some happy moment both arrived together at their culminating point. All this is entirely fantastic and arbitrary; but there are no limits to the power of the will over the associations; men in this state may so mould their feelings to their fancies as to be devoutly affected where the windows are Geometrical, to be lukewarm where the tracery is Perpendicular, and to be so disturbed by the sight of the Classic orders as to be unable to pray in an Italian church. In truth, however, the power of Gothic architecture to predispose to devotion, independently of the association of ideas, is only that which is shared by every other object of nature or art sufficiently striking to exalt the imagination, and of course can act only on minds sufficiently refined to be amenable to such influences. Neither the Gothic nor, indeed, any other of the many styles adopted in different ages and countries by the Church has any essential connection with Christianity, or can claim to be called "emphatically Christian architecture." The Italians cannot understand what we mean when we complain that their gay basilicas, with their magnificent colonnades and golden rather than gilded roof, do not look like a church. To their eyes they look like nothing else. The Jesuits, who sought by a revival of devotion in the Roman Church to withstand the advancing tide of the Reformation, and in order to effect their purpose studied minutely every movement of the human heart, made their churches attractive and devotional by airiness, lightness and grace, by gay colour and profuse gilding. They did not deny the effect of the dim religious light, the sober splendour and stately grandeur of Gothic cathedrals, but they felt that no style of architecture is privileged exclusively to convey religious impressions; they saw that fashion had declared itself in favour of Classic models, and they dexterously availed themselves of its powerful influence.

Burke's and Reynolds's Æsthetics.

Burke makes beauty to consist in smooth and undulating surfaces, flowing lines, and colours that are analogous to them; while Reynolds maintains that beauty does not consist in any particular forms, lines, or colours, but is merely the result of habitual association, by which particular forms, proportions and colours are appropriated to particular kinds and species, the individuals of which appear beautiful or ugly accordingly as they are respectively conformable or adverse to our ideas of the perfection of those particular forms, which ideas have arisen in the mind from a general and comparative view of the whole kind, class, or species. It will readily appear that these two great critics differ so widely merely from attaching different meanings to the word beauty, which the one confines to the *sensible* and the other to the *intellectual* qualities of things, both equally departing from that general use of the term which is the only just criterion of propriety in speech. The doctrines of Burke concerning beauty have been classed and defined under six distinct heads by the most eminent and distinguished of his disciples, and thus illustrated by a well-known example which, if it prove nothing else, shows at least to what a degree the

most deserving mind may be occasionally deprived even of the ordinary powers of perception by the fascinations of a favourite system. "No building," says Price, "is more universally admired for its beauty than the temple of the Sibyl at Tivoli. Let us then consider what are the qualities of beauty according to Burke, and how far they apply to beautiful buildings in general and to that in particular. Those qualities are:—(1) To be comparatively small; (2) to be smooth; (3) to have a variety in the direction of the parts; but (4) to have those parts melted, as it were, into each other; (5) to be of a delicate frame without any remarkable appearance of strength; (6) to have the colour clear and bright, but not very strong and glaring. The temple I have just mentioned has, I think, as much of those chief principles of general beauty as the particular principle of architecture will allow of; it is circular, surrounded by columns detached from the body of the building, it is light and airy, of a delicate frame, in a great measure free from angles, and comparatively small. I am speaking of it as it must have been in its perfect state, when the tint of the stone and the finishing and preservation of the parts corresponded with the beauty of its general form." So far, however, from being smooth, it is built of as rough, porous and unequal a stone as was ever employed in a temple.

Symmetry in Art.

There are objects which it is necessary to present to the eye perfectly symmetrical, either because they are so essentially, as a vertebrated animal (mammal, bird, reptile, fish), a radiated animal (starfish, sea-urchin), or because symmetry pleases us in the form of an object of art which is isolated, as a column, a pyramid, a triumphal arch, a temple, &c.; and it may be remarked that Gothic churches are, for the most part, constructed upon a symmetrical plan. Symmetry pleases also in a circular or elliptical border of flowers, the whole of which the eye takes in at a single glance. Finally, a symmetrical disposition should be observed in the arrangement of many objects grouped around or before a principal object, as the arrangement of such a garden as that of the Tuileries, which had a breadth equal to the façade of the palace, or the arrangement of a much vaster garden, which is co-ordinate to a palace, such as that at Versailles. When a whole is subdivided into symmetrical parts of a definite extent, it can, in many cases without injury to the whole, vary each part without going beyond the point at which discord would arise between them. This is what has been done in the park at Versailles, with a portion called *le miroir*, a charming garden when it is planted with flowers properly assorted. The principle of symmetry is valuable for obtaining a general effect from many objects analogous, but differing amongst themselves, like the varieties of one species, or congeneric species or even species of neighbouring genera belonging to the same family. If there are objects to which a symmetrical form is suited, to the exclusion of every other—if there are grounds which must be laid out symmetrically, in order to connect vegetable nature to a grand architectonic composition—there are also objects to which the symmetrical form is not so essential but that it can be dispensed with, and there are grounds which it is more suitable to lay out on the system of landscape-gardening than according to the principle of symmetry, even when it is not designed for the sake of gratifying a taste for variety. For example, whenever a mass of objects cannot be embraced at a single glance, because they occupy too much space—or when ground which is made of planes differently placed in regard to one another, and even this ground, being flat, is very irregular, and the buildings upon it are not placed as they should be, in a symmetrical composition—it is convenient to throw aside the principle, not to carry out a system of irregularity, but to attain a pleasing distribution of objects, and even to have parts which, considered in detail, will appear less irregular than they would have done as a whole, if confined to a single plane. It is in conformity with these ideas that the planting of masses in landscape-gardening has been subordinated to principles which are very distinct from those absolute ideas of irregularity which some people maintain.

Richborough Castle.

The foundation of the walls of the castrum is formed of two rows of boulders, laid upon, or a very little below, the surface of the natural soil, which is a compact pit-sand. The great body of the wall is composed of layers of boulders and layers of a mixture of boulders, sandstone, ochre-stone, blocks of chalk with pholades embedded and balani on their surface, the whole cemented with mortar formed of lime, grit, sea-shells and pounded tiles. There are also pieces of oolite and travertine, which some geologists have imagined were brought over from the Continent. These ingredients vary in proportions in different places, apparently as particular materials were abundant or otherwise during the progress of the building. It was the opinion of Mr. King that the walls were constructed by having the whole mass flung carelessly into a great caisson, or frame of wood, the interior breadth of which was that of the

wall, and its depth that of the space between the alternate rows of tiles, while its length was sometimes more and sometimes less, just as suited convenience, and that the parts thus reared, one at the end of another, on and over each row of tiles, were united together afterwards merely by means of very small loose stones and mortar thrown into the narrow space left at the ends between them. The objections to this theory are that the separations asserted to be filled up with small loose stones are nowhere discernible. The distances between the bands of tiles are not equal, as they probably would have been had caissons been used, and the materials constituting the body of the walls do not appear to have been thrown in carelessly, but, on the contrary, are arranged with much precision, as seen in the south wall, from which almost the entire facing has been removed, and towards the east side an immense mass of the interior masonry has been extracted so as to form a kind of chamber, in which the regular arrangement of the strata of boulders is clearly shown. In other places, where the walls have been broken into, the same system may not be so obvious on account of the difficult nature of the materials.

Early English Mouldings.

The exquisite skill, taste, and patient labour invariably evinced in the working of early English mouldings are truly admirable. The ingenuity that was never at a loss in any difficulty of finish or constructive irregularity, and the minuteness with which even the most concealed and darkened parts were executed, are circumstances of much interest, and show a love for the art above the sordid considerations of minimum cost. The deepest hollows are all as cleanly and perfectly cut as the most prominent and conspicuous details; and in the village church as much so as in the most glorious cathedral. An early English doorway is often a wonderful piece of art, however little it may attract the attention of ordinary observers. It is most pleasing to notice the long trails of dog-tooth lurking in the dark furrow of a label or channelled recess; to see the end of some inconvenient member got rid of by throwing a flower across the point where it suddenly stops or dies into the wall; to admire the floriated boss and the foliated capital intruding their luxuriance upon the mouldings and hollows, as if they had overgrown their original and proper limits. How beautifully, too, the knots of pierced and hanging leaves extend like some petrified garland or bower of filigree-work round the arch, dividing the plainer mouldings into groups, and almost imparting life and vegetation to the very stones. There are abundance of doorways of this style which exhibit the most delightful varieties on their forms and groupings; always, yet never, the same. Some examples occur at Bolton and Furness Abbeys, whose arch mouldings extend 5 or 6 feet in width. The west fronts of several of our cathedrals have early English doorways of amazing magnificence. The entrance doorway of the chapter-house at Lichfield is a very fine example of the moulding of this style. But almost every cathedral and every ruined abbey will supply good specimens.

The Æginetan Sculpture.

These statues offer the only illustration now extant of the armour of the heroic ages. The bodies of all the figures of this pediment, with the exception of the archer who is encased in leather armour, are uncovered. The great minuteness of execution in the details corresponds with the exactness with which Æschylus, Homer and the earlier writers of the heroic age have preserved in their descriptions. In the whole of these statues this is observable in every tie and fastening; it would appear that the whole had undergone the strictest scrutiny, as in each those parts which, from their position on the building, could not have been seen, are found equally exact; in every particular they are the same as those which are traced on the vases of the most Archaic style, where they are delineated in black on a red ground, as is seen in the Museum collection. The two female figures on the apex of the pediment are clothed, the drapery falls in thick folds around the figure, in their hands they hold the pomegranate flower, the feet are on a small plinth; they are the *Elpis* of the Greeks, the goddess of hope, so well known in museums and on coins, and their situation here is peculiarly appropriate, as presiding over an undecided combat. It does not appear that any of the figures on either pediment had any support to fix them in position but the cornice where they came in contact with it, they must all have been easily removable, and perhaps it may not be unreasonable to suppose that on particular festivals they were so disposed as to represent the actions then in celebration, to recall to the imagination of the votaries the reason for those sacrifices then offered to the god who presided over the temple; this would account why almost all the celebrated groups of antiquity which have decorated the façades of their sacred edifices, among which may be reckoned those of the Parthenon, the Sicilian Adimetum and the Ægina are so completely finished, and shows how what would otherwise seem a waste both of talent and labour was brought to account.

NOTES AND COMMENTS.

BUILDERS who undertake municipal contracts, but do not care to renounce municipal offices, will find some encouragement in a judgment which was given in the Irish Queen's Bench Division on Monday. A petition was presented against the return of a Mr. FITZGERALD as a member of the Corporation of Cork, on the ground that he was a contractor for labourers' cottages which the Corporation are erecting according to the provisions of the recent Act. That he had completed such a contract was not to be doubted, but is it a rule of law that to be once a contractor means that a man is always a contractor? The affair was another example of the easy-going way of transacting business which is peculiar to Ireland. In May, 1891, Mr. FITZGERALD entered into his contract, and guaranteed the completion of the cottages by January 1892, under a penalty of 20*l.* a week. The work was not completed until April. The bill was sent in, and including 283*l.* for extras it amounted to 836*l.* The Corporation engineer cut it down to 41*l.* Arbitration followed, but the award was not given until November. On the 18th of that month it was proposed to pay Mr. FITZGERALD 475*l.* under the award, but there was opposition, and the question of exacting penalties was raised. On November 26 Mr. FITZGERALD's election took place. His bill was paid on December 16. It was maintained that at the time of his election he had an interest in a Corporation contract, and was therefore disqualified. He may be still liable for penalties on account of the ten weeks' delay. The ground taken by the contractor's counsel was that when a contractor had completed his work and was merely in the position of a creditor he ceased to be disqualified. The judge adopted that view, and Mr. FITZGERALD can therefore enjoy his seat in the Council without any immediate apprehension of the consequences.

THERE was an exceptionally numerous gathering of members of the Birmingham Architectural Association and local architects, on Tuesday, to listen to the paper on "Terra Cotta" which was read by Mr. E. LLOYD EDWARDS, of Ruabon. A detailed description of the various processes employed in the manufacture of terra cotta was given. It was explained how the constituent parts of the clay are affected by the firing and manipulation, and that to secure a satisfactory final result careful thought as to painting and due allowance for shrinkage during firing are equally necessary with the skilful handling of the work in the various stages of manufacture. In dealing with the quality of the clay necessary to produce a good terra cotta, Mr. EDWARDS said that the Ruabon clay contained of silica 63 parts, of alumina 20 parts, of oxide of iron 6½ parts, of water 5 parts, and other constituents 5½ parts. To be strong enough to resist the heat of the kilns sufficiently to become thoroughly hard and non-porous, a clay must contain a large proportion of silica, and an ideal clay for the purpose must be strong enough, but without any excess of strength which would cause a twist in the burning. Having given some practical advice as to distinguishing differences between good and bad clay and terra cotta, and about the means to avoid delay in its manufacture, Mr. EDWARDS passed on to point out the most suitable lines upon which to base designs for terra-cotta work, and finally claimed for terra cotta that, in its comparative cost, capability of resisting the action of the atmosphere, beauty of colour and facility of manipulation, it was superior to stone, especially for buildings in large cities with smoke and acid-laden atmospheres. A long discussion followed, and, after replying to the speakers, Mr. EDWARDS, thanked the Association for the reception they had given him, and said that he hoped the members would be able to visit his works at Ruabon, when he would be able to show them all the processes of terra-cotta making in progress, and also several kindred manufactures.

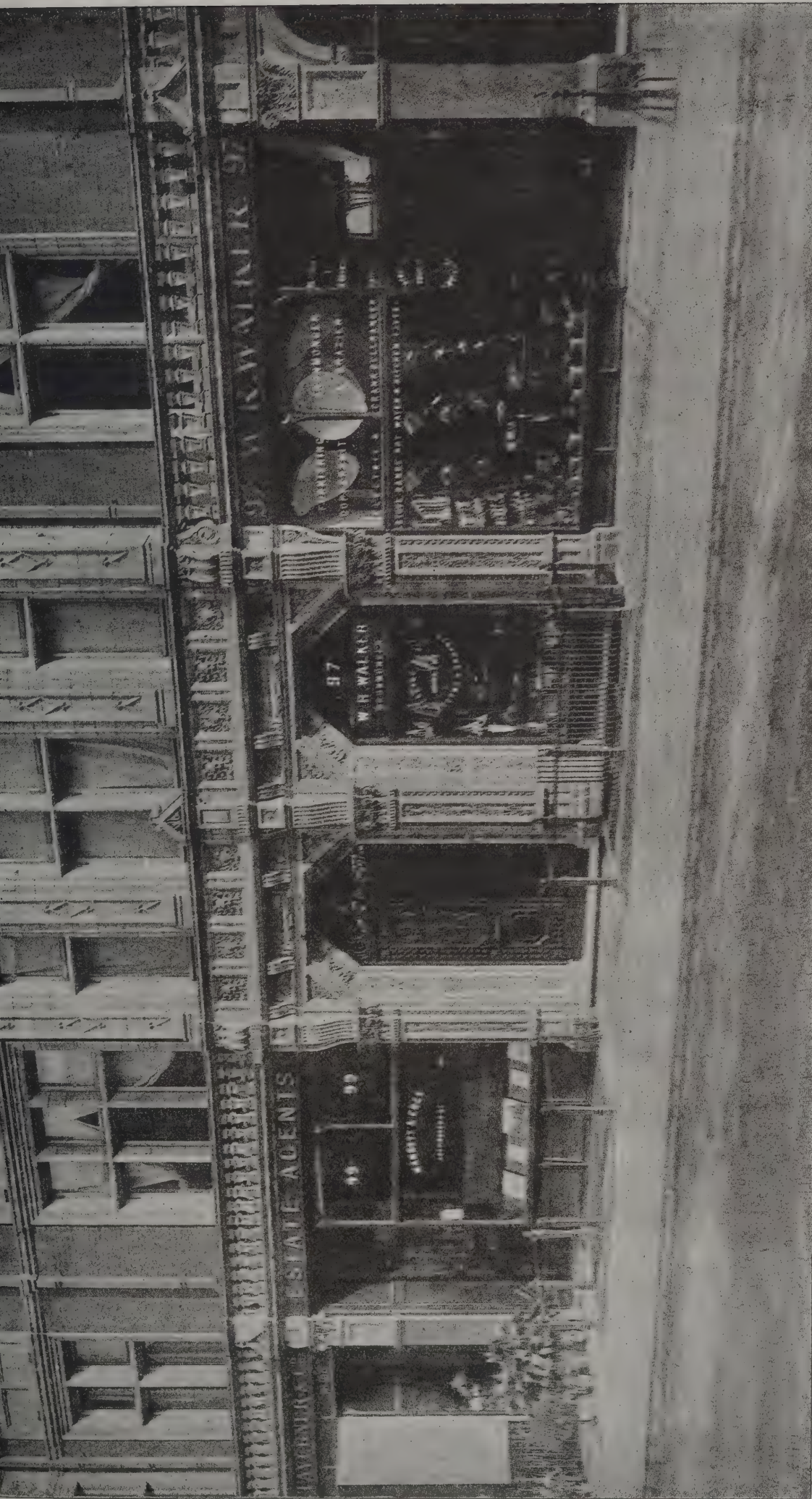
THE advantages of costly steel platforms to carry the lofty buildings of Chicago are beginning to be doubted. According to the *North-Western Architect*, General W. S. SMITH has renounced the steel platform for the new public library, on which he is consulting engineer, claiming that a

slow compression of the soil under the footings follows from the gradual forcing of the water out by the great weights. As solid rock or a very hard overlying stratum is to be found at a depth of 65 feet below the surface, he proposes to dig a trench 15 feet deep, from the bottom of which he drives 50 foot piles reaching the firm stratum. Some of these have already been driven experimentally, and are found to sustain 40 tons each for a period of twenty-four hours without perceptible yielding in any way. The spacing proposed would give a much smaller area for the footings than that demanded by the steel and concrete platforms, while the unsolved question of the durability of the steel will be removed from consideration. There is also a great saving in first cost by using the piles. In New York there is to be employed a still more remarkable process for obtaining a secure foundation for the offices of the Manhattan Life Insurance Company. The building will have sixteen storeys, the soil is fine sand, lying on rock which is about 50 feet below the surface. The *American Architect* says:—It would be hazardous to put so heavy a structure on the sand, but to excavate the sand in order to carry piers down to the rock would be likely to undermine the neighbouring buildings, especially as the sand is saturated with water. This difficulty is to be overcome by sinking caissons, or cylinders of steel-plate, to the rock, so that the sand can be excavated from the inside of the cylinders without fear of affecting the neighbouring soil. In the case of the Manhattan building, however, a modification of the ordinary system is to be introduced. In order to enable the excavation inside the caissons to be carried on under water, they are made with a tight top like a diving-bell, and air is forced into them, so as to keep the exterior sand and water from entering while the workmen dig away the sand from the inside and under the edges. To remove it entirely, pipes are provided, through which it is forced by the atmospheric pressure.

It may not be known outside Scotland that there exists a benevolent fund which may be said to be entirely administered by the Royal Scottish Academy. In 1825 PETER SPALDING, of Edinburgh, made over his property to the Institution for the Encouragement of the Fine Arts in Scotland, "for creating a fund, the interest or annual proceeds whereof to be applied for ever for the support of decayed and superannuated associated artists belonging to the Institution for the Encouragement of the Fine Arts in Scotland." The Institution was originated about 1820 for the encouragement of fine arts in Scotland, the holding of annual exhibitions, the buying of pictures, &c. The functions of the directors of the Royal Institution, so far as regarded its original purposes, came to an end in 1860, when the pictures, drawings and library collected by them were deposited in the National Gallery, and the rooms previously occupied by them as a gallery given up. After that date the sole duty of the directors was the execution of the SPALDING trust. For a number of years the recipients of annuities from the trust fund were selected by the directors. About 1861 the directors thought it advisable to alter the method of selection, and to require that every application should be accompanied by a recommendation from two members of the Royal Scottish Academy. When the Royal Institution had virtually come to an end, and the number of directors had fallen to two, in 1882 they presented a petition to the Court for the appointment of a "factor" or manager for the estate. Mr. WILLIAM FORBES SKENE was appointed, and acted until his death in August. He followed the practice introduced by the directors, and, as an additional precaution, latterly submitted the names of applicants to the President and Council of the Academy, and acted on their recommendation. Since 1861, therefore, the selection of the annuitants has been virtually left to the Royal Scottish Academy. On Saturday the Academicians applied in the Scottish Courts for the appointment of Mr. W. GARSON as factor, as they considered that, under the circumstances, the selection of the annuitants should continue to be entrusted to the President and Council, and that it was to be the factor's duty to give effect to their decision. The arrangement was sanctioned. The value of the estate is about 10,000*l.*

Die Architektur. Feb. 24th 1893.





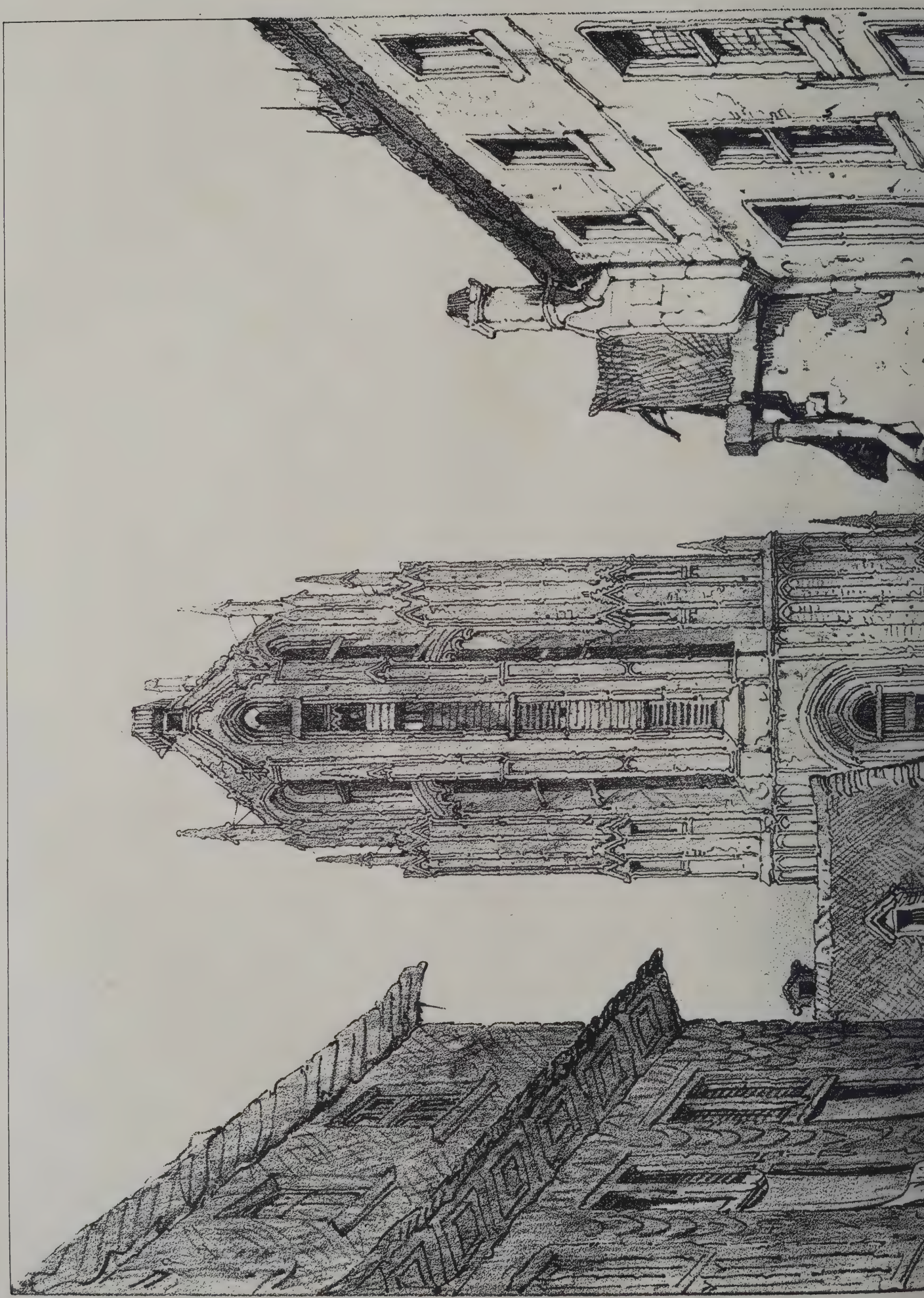
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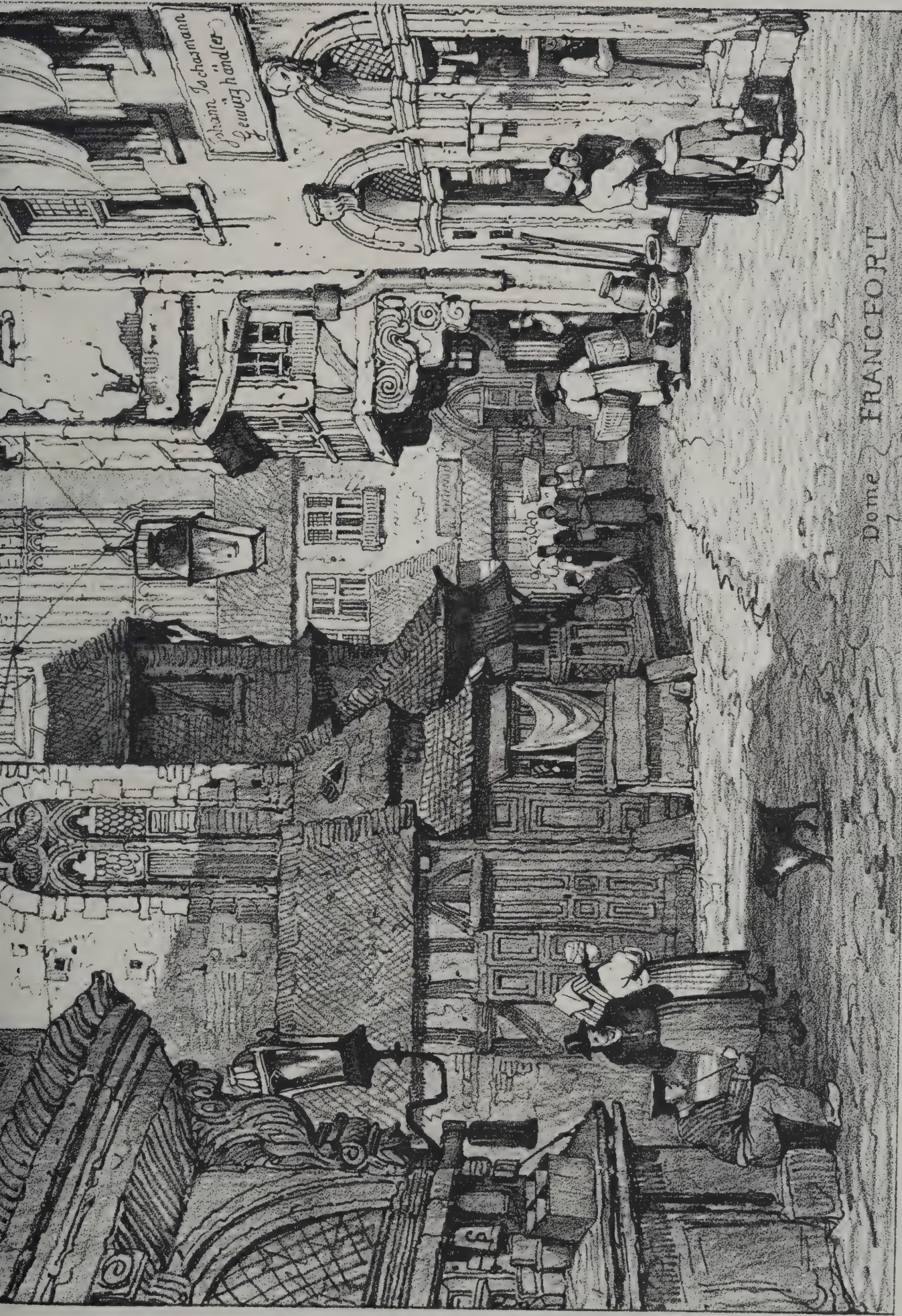
SHOPS, MOUNT STREET, GROSVENOR SQUARE, LONDON, W.
T. E. COLLOUTT, Architect.



MIDDLE-CLASS FLATS: GRAHAM
Messrs. ESSEX, NICO







Dome FRANKFORT

DOME, FRANKFORT.
Drawn by SAMUEL PROUT

PHOTO-LITHO. SPRAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER, LANE & CO.

ILLUSTRATIONS.

SHOPS, MOUNT STREET, GROSVENOR SQUARE, W.

ALTHOUGH Britons have for a long period formed a nation of shopkeepers, it must be admitted that the conditions of trade are not auspicious for anyone who is eager to impart architectural qualities to a shop. It is easy to perceive in the illustration (from Messrs. BEDFORD, LEMERE & Co.'s photograph) we publish where Mr. COLLCUTT was hampered, as well as what could be done if there was less faith in the virtues of immense sheets of plate-glass and prominent signboards or fascias among London shopkeepers.

MIDDLE-CLASS FLATS, GRAHAM ROAD, HACKNEY, E.

THE illustration shows the block of flats now in course of erection from the designs of Messrs. ESSEX, NICOL & GOODMAN, architects, of London and Birmingham. They occupy a site near the Hackney Station of the North London Railway. They comprise six separate buildings, each six storeys high, with separate staircases to each, leading to suites of two, three and four rooms, the suites being so arranged that they can be converted into suites of five. Each has a kitchen with larder, sink and dust-shoot and water-closet; the wash-houses are in the roof, with drying flats adjoining. The material used in elevation is pressed red brick and stone and tile roof. The whole of the floors and staircases are of concrete, thus rendering the buildings completely fireproof. The open spaces between the various blocks will be laid out as public gardens. There will be 414 rooms in the whole block when completed.

THE CATHEDRAL, OR DOM, FRANKFORT.

POTTERY GLAZES.*

IN many cases glaze is to a pottery-designer what the canvas is to a picture-painter—the field whereon he is able to express his conceptions. But it is sometimes more than this: it is often the varnish which, while protecting his work, gives brilliancy to his colouring. Nor is this all; in many instances it is allowed to become the vehicle by means of which the design is harmonised and mellowed into a beauty of tone only possible to the painter on canvas after long years of patient waiting for time itself to effect.

Glaze may be translucent, transparent or refractive; it may be iridescent or full of the richest colouring, and it may be soft as vellum or brilliant as the diamond in its texture; in short, it is capable of producing, under the touch of a master hand, a harmony of result rich and powerful in tone as an autumn sunset or tender and delicate as the dawn of spring.

It is not necessary to occupy time by referring to the origin and development of glaze in pottery. The various stages, from the closing of the surface of a porous, sunbaked ware, with some cerate to make it water-tight, onward to the brilliant texture of true porcelain, embrace the entire range from primitive utility to the highest decorative embellishment, fascinating to the eye and exquisite to the touch.

Though the functions of a glaze are mainly to render the ware impervious and cleanly, and to impart smoothness to the surface, it must be conceded that in decorative pottery these qualities are often made to subserve the embellishment of the object. In the case of this Satsuma vase, for instance, the fine crackle adds greatly to the beauty of the result, but it undoubtedly holds the dirt and grease.

It is no part of our province at present to discuss how far such sacrifice of the useful to the æsthetic is legitimate. It will rather be attempted to show how the treatment of the glaze itself may serve to enhance the beauty of the material by employing its peculiarities to the best advantage in the decoration of the ware.

Definitions.

Two main subdivisions are at once marked out by the method of the preparation, viz. raw and fritted glazes.

A glaze may have all the materials requisite to its composition carefully ground and held in suspension by water or other vehicle, and when the needful heat is applied upon the surface of the ware these materials are fused into a vitreous glaze or enamel, as shown in these specimens of fired and unfired enamelled stoneware—such is termed a "raw" glaze. It is possible to secure satisfactory fusion by this method when the materials are insoluble, but when soluble alkaline and other

salts are added it is necessary to melt or flux the ingredients together, thus insuring ultimate vitrefaction. After grinding the resulting "frit" in water, the ware is, as before, covered with this "fritted" glaze, as shown in this example of earthenware. Moreover, the composition may be so arranged that the firing of the ware and of the glaze is accomplished at one operation, or if necessary the body may be fired before glazing. For decorative purposes these distinctions have a most important influence on the result, as will hereafter be seen.

The general term "glaze" may be broadly divided, according to texture, into five main divisions:—1, Enamels; 2, glazes; 3, smears; 4, flows; 5, salt or vaporous glazes; 6, lustres.

1. Enamels may be opaque or translucent. Covering the surface they altogether conceal or partially modify the colour of the ware beneath. This may be effected by various means:—(a) By fusion with metallic oxides, as tin or arsenic. (b) By suspension of opaque particles in a transparent glaze. (c) By semifusion of raw glaze. Examples of each of these methods are here seen.

2. Glazes.—The term "glaze" is properly confined to a transparent varnish covering the ware. It may be:—(a) Colourless; (b) stained; or (c) curdled.

3. Smear is a thin, transparent semi-glaze sublimed on the ware during firing. The inner surface of the sagger in which the object is placed in the kiln is washed with a mixture of lead, alkali or other material capable of volatilising by high temperature. Small quantities of this mixture are sublimed upon the ware, giving the delicate texture seen here. When a clay contains much soluble alkaline salt, these by evaporation of moisture are brought to the surface, and during firing often produce a "smear" upon the ware.

4. Flows are somewhat distinct from "smears," although applied similarly. Volatile salts are mixed with carbonate of lime, &c., and placed within the sagger, causing a vapour which increases the fusion of the glaze already laid upon the ware, at the same time swimming the colour, and thus imparting softness to the design as shown here.

5. Salt glaze.—Altogether distinct from the above methods is that of salt glazing, made familiar to most by the interesting examples of old Grès de Flandres and Burslem stoneware, and in modern times by the well-known productions of Messrs. Doulton, at Lambeth. The process so often described is as simple in its operation as it is complex in its chemical reaction. The ware when dry is placed without glazing in the kiln. When at the vitrifying temperature common salt is added through small holes in the roof of the kiln. The consequent vapour fills the entire interior of the kiln, attacking every portion of the surface of the ware, and forms by chemical combination an extremely hard and thin glaze. One great advantage of this method is the equality of thickness afforded by the glaze to every part exposed. In a dipped glaze, on the contrary, the hollows are often unduly filled up to the detriment of the piece.

Classification.

The classification of glazes has been attempted at different times with varying success. Brongniart gives three classes only:—

1. Varnish, or glazes fired at low heat, including those with lead and borax.

2. Enamels, or opaque glazes.

3. Cover, or glass-earth, including those which mostly fire at high temperatures equal to that of the ware itself.

Salvetat divides into seven classes, thus:—

1. Lead glaze—coarse earthenware.

2. Boracic glaze—granite ware, fine earthenware.

3. Tin glaze—Urbino ware. Della Robbia ware.

4. Silica alkali—salt glaze stoneware.

5. Earth alkali, or felspathic glaze—porcelain enamelled stoneware.

This plan of taking the composition of the glaze as the basis seems, on the whole, the most satisfactory, though it has one objection, viz. that it indicates neither texture nor density, because the proportion of the various ingredients is not taken into account, and results widely differing are therefore brought under the same heading. Each of these classes have their distinctive features, which need the attention of the ceramic decorator.

Lead glaze, for instance, is especially liable to trickle and run down the ware, and when compared with boracic glaze under the same conditions this is very evident. The latter, as shown here, keeps its position on the vase, while the lead glaze has run down. This is often the destruction of the underglaze painter's work, lines and bands being liable to slip down with the swimming and falling of the glaze. Another peculiar property of boracic and soda glaze is the power it possesses of developing the colour in turquoise enamels, and those rich *flambée* (*sang de bœuf*) effects which are so skilfully obtained in some of the old Japanese wares.

Tin enamels have a quality entirely distinct, produc-

* From a paper by Mr. Wilton P. Rix, read at a meeting of the Applied Art Section of the Society of Arts and published in the *Journal*.

characteristic effects on the design in which they are employed. The object of the opaque enamel is in most cases to obliterate the low colour of the body beneath. Hence the thickness is considerable, and, inasmuch as the fusion of the glaze is not in all cases complete, the modelling of fine details is avoided. Hence the broad effects of all the Della Robbia work. Neither do the colours allow of any strong contrasts of shadow in the hollows, as is the case with coloured glazes. The light being reflected only from the surface, there is a flatness and sameness of effect which, notwithstanding the splendid skill that has been devoted to the decoration, compels us to place it in a secondary position in the list of available materials.

For decorative purposes glazes may be broadly divided into coloured or uncoloured.

In Texture.—(1) Transparent; (2) translucent; (3) curdled; (4) opaque; (5) lustrous.

In Construction.—(1) Dead, or non-reflecting; (2) pitted, or egg-shell; (3) brilliant or vitreous; (4) bubbled; (5) cracked.

Decorative Value.

Apart from these distinctive classifications, the decorative value of glazes in ceramic design is a matter of considerable interest, and it is the object of this paper to show that the glaze itself plays a very important part in the artistic result. Beyond this, it may also be demonstrated that the relative merit of various glazes is based upon certain optical principles which have been at present only partially examined by scientists, and that these principles, which underlie the pleasurable sensations to the eye, really govern that which we are pleased to call good taste and excellence, so far as glazes are concerned, and are not mere matters of opinion.

The value or utility of a glaze for decorative purposes is affected—

1. By its colour.
2. By its fusibility.
3. By its construction.

1. Colour.—The colour of a glaze is obviously of the first importance. Here are various illustrations.

The purity of white seems to be less pleasing in the case of this vase than the ivory tone which blends more fully with the colours of the design.

Here the colour of the whole is harmoniously assisted by covering the surface with this rich, warm orange glaze, blending, with the happiest results, the tone of the design and that of the background, the contrast of which would have appeared raw and cold without it.

In this instance, again, the best possible effect has been secured for the decorator by dipping his work in a warm glaze, which, while softening the outline, has also given strength and tone to the whole.

In all these examples, the glaze has been used merely as a dip, covering the whole piece. But there are further uses of it, which have been much improved of late years, following the methods of majolica, Palissy ware, and the Grès de Flandres. In all of them coloured glazes are substituted for pigments, and pencilled over various sections of the design, which is often modelled in relief. Examples of this are to be seen here. It need hardly be pointed out that in the pencilling of glazes by this method, the details of work are greatly limited. The glaze is generally thick, thus clogging to the brush, and it becomes somewhat unmanageable.

This suggests the query if an equally pleasing result may not be obtained by pencilling pigments only, and dipping after in a transparent colourless glaze. But a moment's reflection will show that the value of the two methods is not by any means the same, and that while gaining in definition and ease of production, there is considerable loss in richness and mellow-ness of effect and of satisfaction to the eye.

In order to demonstrate this, let anyone place at the back of a plate of white transparent glass a piece of dark blue paper, and at the back of another thick plate of blue glass of the same tone and thickness a piece of white paper. In a strong light the comparison of the two will at once convince the observer that the tone and quality of colour in the latter is greatly more pleasing. Though it may not be possible to enter here into all the complex details of the amount of light absorbed, refracted, reflected, and scattered in the two cases, it is not difficult to show that what is thus apparent to the eye has its foundation in something more than an æsthetic opinion.

Fusibility.—The second, and equally important quality affecting the value of glaze, is its fusibility, which greatly affects its power of refraction. All transparent glazes should be fused to the highest degree of temperature which they will bear without trickling down the piece; and, at first sight, it would seem that, provided the glaze is smooth and clear and evenly fused over the whole surface, difference of hardness or density will be immaterial, except on the score of durability. Such, however, is by no means the case. The higher the temperature a glaze will stand, the greater the hardness; and the greater the hardness, the greater the power of refraction. The greater the

refraction the greater the brilliancy of the light reflected back to the eye, and the greater the pleasure appreciated therefrom.

Construction.—Another, and equally important consideration in the quality of a glaze is its construction or texture. This greatly affects its beauty, as upon it depends its translucence, or power of reflection.

(a) A glaze may be opaque, but it may reflect much light from its surface. Or (b) it may be translucent, reflecting scattered light which has penetrated the surface; or (c) it may be transparent, allowing the greater part of the light to pass through it to the ware itself, being reflected back to the eye from the background. (d) And, further, it may be transparent in itself, yet loaded with opaque particles which partially reflect and partially scatter the light, often with the happiest effects and the richest beauty of result. (e) In addition to all these, a glaze may have imported into it some peculiar quality from the incomplete mingling and fusion of the material, through intentionally firing to an insufficient temperature. This mostly happens with raw glazes.

Doubtless the difficulties and risks of manufacture are great, chiefly owing to the fact that it is necessary to expose the ware to the flame of the open fire. It is not therefore surprising that a process so difficult, and needing such watchful care and experience in its completion, should have been gradually abandoned in Staffordshire in favour of the easy methods of dipped glazes and sagger-burning; and it is greatly creditable to the enterprise of Sir Henry Doulton that, in the face of acknowledged obstacles, salt-glazing has again been raised to the position of a fine art, so that its productions are able to vie with and even surpass the results of every age and country.

With the most perfect fusion the surface is never quite evenly covered with glaze, the reflected image being always somewhat distorted. Even this, however, gives additional pleasure by breaking the monotony of the surface. It is only necessary to compare a piece of ware lapidary polished with a piece of ware glazed to see that the mechanical surface is much less interesting. By some designers this quality of brilliant reflection of light from the surface is considered a detriment to the ware because it is liable to interfere with the design, often entirely obliterating the effect of the work. It is quite possible to avoid this objection by adopting any of the various expedients for breaking up the reflecting surface. In this example it will be seen that the plain glazed surface of the upper portion reflects the light freely; whereas the surface of lower portion being broken up by the impression of a very fine network is entirely free from this defect, although the whole vase is evenly covered with the same thickness of glaze.

The same effect has been secured by Messrs. Maw in their "Morocco" surfaced tiles, which are made non-reflective by a similar method. This is a matter of much importance in ecclesiastical decoration. Strongly glazed tiles are open to much objection in obliterating the design by reflection. And the manipulation of enamels and glazes by dulling of the surface in painting and firing is a great gain, giving as in this panel all the effect of tempera work. On the other hand, it is equally possible for the skilful designer to lay hold of this quality of reflection and so add interest by emphasising it. Here is an instance in which the chief quality of the design depends on the high reflective power of the surface. It is only necessary to compare it with this unglazed piece of similar design to appreciate the great superiority of the former.

Doubtless all these various qualities, the subtle combination of which together constitute the beauty of any given ware, may appear to be minute and even trifling, but the very minuteness of the variations together with the complexity of the results are in themselves a source of satisfaction. The extremely sensitive organism of the human eye gives it the power to appreciate the most delicate and subtle changes of light, colour, and form, and the sense of this power, as well as the very opportunity of exercising that refinement of discrimination, is in itself a means of infinite mental enjoyment.

There is still another point which demands attention before leaving this part of the subject, viz. the scattering of light, due to the character of the background immediately underlying the glaze; a matter which, in its influence on the artistic result, is by no means unimportant. It must be evident to all that it is possible to leave the unglazed surface of the ware in a variety of conditions before covering it with glaze.

(a) It may be roughly formed without any attempt to smooth it carefully; or

(b) It may be completely burnished, so that the surface is to a great extent impervious to the glaze fusion; or

(c) The surface may be purposely formed of coarse granular particles, leaving an irregular formation on which the glaze is deposited, and into which it fuses.

The soft translucence of porcelain is greatly due to this intimate blending of the glaze and body, uniting the whole into one mass, having no sharply dividing line between the two, so that when the light penetrates the transparent glaze, it is reflected and refracted from the surfaces of the minute crystals

resulting from the combination of the clay body with felspathic flux.

In beauty of texture, the material is unsurpassed, uniting, as it does, all the highest qualities of the potter's art; an enduring evidence of the triumph of human skill and persistence in conquering the most serious obstacles which stand in the way of its successful production.

It is hardly necessary to remind the decorator that the material to be employed as well as the tools and appliances for carrying out the work must greatly modify the treatment. Especially is this remark true in respect of pottery glazes. The design which might prove admirably suited for underglaze work on bisque must be wholly unfit for painting on raw enamel; and, for many reasons, an artist is compelled to inquire before proceeding the nature of the glaze to be used for the completion of his work, unless he wishes to run the risk of hopeless disappointment in the result.

Decorative Application.

Having thus far treated of the characteristics which, for purposes of decoration, give value to a glaze, and at the same time attempted to explain some of the principles to which those peculiarities are due, I may perhaps be allowed to draw attention to a few examples of the successful application of various glazes on the embellishment of pottery.

A.—Subordinate Treatment.

In many instances the designer is naturally led to subordinate the glaze entirely to the main features of his work, using it as a means of adding brilliance to his result, or of imparting a soft translucence. A comparison of the two methods is furnished by these beautiful examples of Worcester porcelain and that of Messrs. Copeland. In the first the ivory-toned ground is made the field upon which gold enrichments have been added, the translucence greatly assisting the beauty of effect; while in the latter, brilliant transparency and purity of the glaze serves to give piquancy to the whole; or, to take another instance, it is interesting to note the same skilful subordination of glaze to its purpose in the treatment of this exquisite design by M. Solon. The soft and tender fading of the half-tones into the background is greatly enhanced by the rich glazing, which, however, does not interfere with the delicate modelling of the subject. Comparing this again with the vase here shown, designed by Flaxman, it is not difficult to apprehend the reason for the different treatment of the modelling adopted. Having no intention of glazing, the artist has trusted alone to the pleasant translucence of his material to overcome any harshness of effect. Looking at the two examples, one feels that it would be as unpardonable to add the glaze to one as to remove it from the other.

It must occur to the least initiated that the comparison of advantages in painting over or under the glaze is most important to the ceramic designer. For endurance and for softness of tone the underglaze system is undoubtedly superior; nevertheless, the palette thus becomes limited, and many otherwise available effects must therefore be discarded. Moreover, in some cases the placing of colour or gold over the glaze heightens the beauty by enabling the eye to more fully appreciate the translucence or the thickness and tone of the glaze beneath.

In this example the gilding on Doulton ware glaze gives a sense of satisfaction from the same cause. Equally pleasing is the gilding on this vase of "Crown Lambeth" ware, which also affords an illustration of a somewhat different manipulation.

The design mostly painted on the biscuit is, after glazing and firing, retouched and worked up with underglaze colour, being again glazed and fired at the same heat. The blending of the finishing colour with the glaze, in which it is thus entirely embedded, while affording some considerable risk for the decorator, gives a soft and mellow gradation of tone which can hardly fail to commend it.

Midway between the "subordinate" and what may be termed the "principal" use of glaze as a decoration, one finds a class of treatment involving the use of glaze in harmonising or mellowing the tone of the whole design by a variety of methods. The simplest of these is perhaps the adoption of a "crackle glaze," as in the well-known Satsuma ware. It is not necessary to expend time on explaining the different adjustment in shrinkage of the body and glaze which causes this. It may be sufficient to point out that, in cooling, the whole surface is broken up into a network of small cracks. The reflection of light thus obtained on the edges of the fractures acting as facets breaks up the plain surface and tends to add brilliancy as well as harmony to the whole. A good example of this effect is to be found in many of the wall-tiles produced by Mr. De Morgan.

Another expedient for the same end is to be found in the covering of the surface with a coloured glaze, giving a certain tone to the whole as previously mentioned. In the example here shown the beauty of the work is greatly enhanced by the rich green glaze in which it has been dipped.

A third method is illustrated by this piece of Lam-

beth Carrara ware. A white background is decorated in green slip, the hard contrast of the two being subdued by covering the whole with a semi-opaque glaze, which tones the colour while it emphasises the brush modelling.

B.—Principal Treatment.

Passing on to the use of the glaze itself as a principal decoration, we note many interesting and ingenious adaptations. The use of broken colour alone, combined with small crackle, affords the *motif* for the well-known and much prized tortoise-shell ware of Wedgwood, as also in the beautiful specimen of Aventurine glaze of French manufacture, resulting from the combination of iron and copper with an alkaline glaze. Also in these reproductions of the Japanese tea-jars in Doulton ware. The lustrous surface gives sufficient interest to the beautiful production of Bealek and other similar pottery, while the movement of the surface is illustrated in this specimen of the ware of Japan; and in this we have another very peculiar and striking instance of glaze treatment. The glaze, having crazed at an early stage of the firing, gradually contracts until each minute section shrinks away from its neighbour and becomes a small round drop, giving the whole the appearance of peach-stone or nutmeg surface.

A further and striking development of the same idea is here shown in another method. The glaze is first of all formed into small, glassy beads, and these are embedded in a coating of glaze dipped on the pot while the same is wet. After firing, the refraction of light gives from some points of view a very singular and brilliant result. Here, again, is an altogether different adaptation of the material instanced in these delicately skilful productions of Messrs. Minton. After finely perforating a design in the ware, the piece, when fired, is covered with a glaze sufficiently thick to fill the interstices, with the most charming and artistic result.

Almost all the above have as their basis the desire to produce satisfaction to the eye by variety and contrast through the breaking of the surface of the colour of the glaze.

A very happy and extremely delicate combination of both treatments is well illustrated by the "mother-of-pearl" background, a clever and ingenious texture lately produced on Messrs. Doulton's Burslem china. Its iridescence, although apparently similar to lustre, is altogether distinct in the method of production, as will be seen on close examination.

Altogether different from the modes already named is the filling of an intaglio design with a soft glaze. The ware is horizontally fired, and the coloured glazes flowing to a uniform level during fusion produce a shaded effect, according to the varied depth of the design. Here are very characteristic examples of this method. A similar operation, but upon a modelled surface, is here adopted.

It has been my desire, in thus limiting attention to one section only of the potter's work, to arouse at the same time in the ceramic designer a wholesome pride in his material, and a true respect for his handicraft. Nothing short of complete excellence and thorough honesty of workmanship in the potter's art can withstand the searching test of that extreme fire necessary to produce the most perfect and enduring result; and as in other spheres of life, so in this, disintegration is the ultimate penalty of all that is false and superficial and immature. Nor is it possible to avoid the conviction that, for the attainment of the highest perfection, there must be added to this honesty of purpose that absolutely harmonious co-operation of each towards the final result, which is the truest ideal of human existence.

Pottery consists of a chain of operations in which there are many links, each process in itself complex, and in its principles far from completely comprehended. Yet the failure of any single link brings disaster and dismay, wrecking the willing work of all that have gone before. Notwithstanding this, the triumphs of pottery in China, Persia and Japan are marvellous, not merely as creations of beauty, but as examples of what may be accomplished by means so primitive and methods so simple that they would seem to be within the grasp of every beginner. Yet one is humbled by the reflection that, notwithstanding all the advances of science, and all the perfection of modern mechanical appliances, added to the combined experience of a hundred generations, the achievements of these Oriental potters have baffled all the efforts of modern times to equal or surpass them.

Nevertheless, in this we find no cause for disappointment; rather let us take courage in the fact that in pottery, as in other arts, the path to success lies in the painstaking discrimination of results and the unbounded ambition to arrive at the highest standard of excellence, scorning to be satisfied with aught that falls short of the ideals we have set before us.

Sir Henry Doulton, the chairman, said this was a most interesting and valuable paper, full of information and suggestion. Even those who were not potters could appreciate the important part that glaze played in the beauty, harmony and durability of pottery. There was one popular misconception

with regard to glazing which he should like to dispel; a bright glaze, as a rule, gave no security for durability, and he did not think the potter's difficulties in this respect were sufficiently appreciated. To take a simple illustration: a common Sunderland milk-bowl with a beautiful cream-coloured glaze inside was very nice to look at, but the body on which the glaze was run was comparatively porous, and it would be seen, if any housekeeper attempted even to salt anything in that pan, that the glaze would come off; it would not require even acid to take it off. The glaze was beautiful enough, but the body itself was lacking in hardness. Sometimes these bright, beautiful, coloured pieces were hard in body as well as hard in glaze; it was that which taxed the potter's ingenuity and skill to accomplish. Mr. Rix spoke of the links there were in the potter's art; and, in fact, there were a good many, and the strength of a chain was only that of the weakest link—a proverb which all potters could thoroughly appreciate. The potter might have forged the whole chain, and then the last link failed him, and the whole work was a failure. The great merit of the paper and the originality of it was in showing the optical laws which had not previously been noted in connection with the beauty of glazes, and he felt certain that an optician following out the line of argument he had suggested, would come upon certain principles which, if attended to, would make a piece of pottery beautiful. No doubt the Orientals, by tradition and otherwise, had arrived at results which we had to arrive at by scientific methods. He might mention, as an illustration, a tile panel which he had the good fortune to possess; a Persian panel which Mr. Sparkes first directed his attention to. It had that beautiful effect of translucency in a most eminent degree, and it was borrowed by M. Purdon Clarke to place in the Indian collection at the Paris Exhibition of 1878. In the course of the exhibition he heard that Mr. Deck, the great French potter, wanted to see him, and it turned out that he wanted to purchase this panel, and though he told him he did not want to part with it, he saw him three times about it, pressed very hard, and said he would not only give a very good price for it, but would make him one which he would be hardly able to distinguish from it. One remark in the paper was with reference to the touch of pottery; and that reminded him that a gentleman who highly appreciated Wedgwood ware, Mr. Edkins, of Bristol, sitting by his side one day at Christy's, said he judged more by the touch of Wedgwood than by anything else; that he could rely on that quite as much as his eyesight. With regard to the salt-glazed ware, it might not be generally known that it was applied twenty-five years ago only to the commonest ware—to ginger-beer bottles, blacking bottles, and drain-pipes. At one time Bristol and Lambeth were the great centres of the salt-glazed pottery trade, but there was not a single salt-glazed pottery in Bristol now, and in Lambeth it was fast going out; and but for drain-pipes, and his own love of it, it might perhaps have gone out altogether. It was a most interesting glaze, utterly unlike any other. It was something like electrotyping, or, rather, was superior to it, because electrotyping was the deposit of one metal on another; whereas salt-glazing was an actual action of the vapour on the silica itself, and so the glaze was actually the body itself fused. The difficulties of it only a potter could appreciate. It was worked in an open kiln, without any sagger to cover the pieces, and with all the gases from the coal playing about them. The consequence was, that in that very beautiful little piece of Mr. Tinworth's which had been shown, which illustrated what was possible at that time, the blues were black, and for a long time they could not get a blue at all. The whole range of colours possible in salt-glazed ware were shown in the specimens exhibited. In 1750 or 1760, in Staffordshire, glazed ware of this kind had arrived at great perfection; it was fired, not in an open kiln, but in saggars with holes in them; and if anyone came across a piece of that kind at a reasonable price, he should advise him to secure it, for he did not think any more would be produced. The finest collection of it belonged to Professor Church, and it was destroyed in the fire at the Alexandra Palace. In conclusion, he would only say that science and art were not antagonistic, and Mr. Rix had in his paper shown how they should be combined.

OUR DUTY IN RESPECT OF ANCIENT BUILDINGS.*

I HAVE chosen this subject because, for some time at least, it has not been discussed in the Association, and because it seems to me appropriate at the present time. There is, from a variety of causes, a much wider interest taken than formerly in the buildings connected with the nation's past, and, as some of us at least think, the current views as to the proper treat-

ment of such buildings are not altogether wise. The subject is one on which it is natural that there should be some difference of opinion, and I submit to you the following remarks for criticism and discussion.

We need not waste time in proving, what all will admit, that we have a duty in respect of these buildings, both a filial and patriotic duty to those who have left us the buildings, and a sacred trust to fulfil for those who shall come after us; but it may be well to consider for a moment wherein the value of these old buildings consist. Clear ideas on this head will help us to just conceptions of our duty in regard to them.

From the artistic point of view they are valuable as examples of the art of a bygone age, as part of the great record of art progress and development; but many are also and specially valuable because of their own exceeding beauty. This beauty is, or may be considered, intrinsic, always possessed by them and independent of the accidents of place or time; but very little consideration will show that this quality is more likely to be present, to be present in higher degree, and to be more recognised and valued, in an old building than in a new one. It is more likely to be present, and present in higher degree, because probably the building is one of a time when the traditions of art and the orderly and natural development of artistic forms and methods were unbroken, when the artist therefore, as it were, spoke in the vernacular instead of in an acquired language and had greater ease and facility of expression. More than that, so far as there has been a conscious choice in preserving certain buildings and allowing others to pass away, or even actively effecting their removal, that choice has been exercised in the preservation of what was felt to be most worthy of preservation, so that this process of selection has acted in favour of a high standard of excellence among the buildings that remain. But the beauty that exists is more likely to be recognised and valued in an old building than in a new one. We go to it in a more receptive mood. No work of art that is worthy of the name renders up all its charms on a first acquaintance. It requires frequent and loving study, and that mere acquaintance should ripen into intimacy, before all its beauties are disclosed. Now this prolonged and loving study we are never disposed to give to a new building, however great its excellences. We never quite lose the critical attitude, we keep the point of the sharp steel between us lest we should be surprised into unqualified admiration, and if we find nothing else distasteful its very newness is repellent. You will remember how the narrator in "Maud," "spleenetic, personal, base," as he describes himself, morbidly jealous of the young lord in whom he sees a possible rival, fastens on the newness of his castle as a grievance:—

Seeing his gewgaw castle shine
New as his title, built last year,
There, amid perky larches and pine,
And over the sullen-purple moor
(Look at it) pricking a cockney ear.

With these few touches the picture is before us, and we feel that the savage young critic has some reason on his side, that this castle on account of its very newness is out of harmony with its surroundings, and that long years must pass and the perky larches and pines have grown into mighty forest trees, ere the rich stains and mellowing influences of time bring it into harmony with the purple—no longer sullen-purple—moor.

And this brings us naturally to the second element in the value of our old buildings. Besides the value which they possess on account of their beauty, they are valuable on account of their age. They are so many voices out of the past, and so clear and explicit is their speech that they almost place us alongside of the builders—"it is as if we touched their hands." As Ruskin has written:—"How cold is all history, how lifeless all imagery, compared to that which the living nation writes and the uncorrupted marble bears!—how many pages of doubtful record might we not often spare for a few stones left one upon another. . . . It is well to have not only what men have thought and felt, but what their hands have handled, and their strength wrought, and their eyes beheld, all the days of their life." And it is not difficult to realise how powerful, how widespread, and how far-reaching this influence is. What is it that marks the greatest difference between our nation and a tribe of Australian savages? Is it not that we have not only a past but a history of that past—a history imprinted on these buildings of which we speak, a history which we can touch and handle, and which we have but to lift up our eyes to read? What puts an immeasurable distance between our city and the most flourishing of colonial cities? Is it not that by those buildings in our midst we are linked to the centuries, and feel ourselves one with the past of humanity? What a difference these surroundings make in our existence, and how poor it would become if the historic past were wiped out, and our life were limited to to-day, with its work and struggle and the outlook for to-morrow. When the young Israelite asked his

* An address delivered by Mr. W. W. Robertson, president, before the Members of the Edinburgh Architectural Association, and published in the *Transactions*.

father, "What mean these stones?" his father was enjoined to rehearse in his ears the wonderful dealings of God with His people; and even so these old buildings supply to our children, no less than to ourselves, a vivid memorial of all that is most worthy of memory in our national past, and all that can incite to patriotism and noble effort in the future.

Yet surely some of our citizens had but an imperfect appreciation of this when a few years ago it was seriously proposed to remove the centre of municipal life from the Old to the New Town. For eight centuries the full tide, not merely of municipal but of national life, has flowed up and down this old street, so that myriads, from all the ends of the earth, come now to view the scenes of so much that has been great, and strange, and tragic. Yet it was proposed that the citizens themselves should turn their backs on their past, as if all these associations were nothing compared with some slight and, indeed, altogether imaginary increase of convenience.

Buildings which have remained in continuous occupation are subject to their own special dangers. The conditions of their occupation are continuously changing. What met the requirements of a few centuries ago does not meet the wants of to-day; even what was sufficient a generation ago is felt to be inadequate to present needs, and there is always a danger, unless there is a mastering sense of the value of the old work and the importance of preserving it, that it will be sacrificed piecemeal, or its integrity and interest impaired under some supposed pressure of necessity, which a higher sense of duty would discover to be less imperious than supposed, or only of the nature of conformity to a passing fashion.

Only buildings whose use has continued without material change can hope entirely to escape this danger, and few in our country occupy this unique position, a position which is well exemplified in the case of country churches in England.

In all domestic, municipal, or civil buildings, except in stationary communities, changing circumstances bring new wants, which press hardly upon the chances of unimpaired preservation. In Scotland the adoption of new ideals of worship led to serious interference with the interiors of old churches. We need go no further than St. Giles for an example. Here the division into several churches, and the construction of pews and galleries, led to destruction which we all know and deplore. When the excrescences in question came to be removed, and the extent to which the beautiful carved and moulded work had been demolished was made clear, the question might well have been asked whether total neglect and wanton injury, the ravages of faction and of the elements, could have worked more complete destruction had they reduced this building, like so many others, to the state of a mouldering ruin.

There are other perils attending continuous occupation to which we need only allude. The danger of destruction by fire should, with an awakened sense of duty, be now amply provided against, but that the danger has been real enough is shown by the fact that both the Royal Palaces of Holyrood and Linlithgow were almost totally destroyed by fire within less than 100 years. In each case the fire occurred, we must say accidentally, while the palace was in the occupation of troops quartered there by the authorities. We shudder at the catastrophe, but how very consoling it is to know that no such thing can occur at the present day, that no national buildings are now put to uses inconsistent with their ancient dignity or involving special risk of injury or destruction.

The special dangers to which ruinous buildings are exposed are sufficiently evident. There is the danger of decay and injury by the natural agencies always at work. During last century they were exposed to spoliation and wanton destruction at the hands of those who found them convenient and economical quarries for the building-stone which they required. It is to be hoped there is now no danger of wanton and deliberate destruction; but a danger special to the present century has taken its place—a danger which I do not name as yet, because I wish to carry you with me a little longer, and I fear that the mention of the fatal word will be the signal for suspicion and criticism and dissent.

We have thus far considered, in a rambling and imperfect fashion, the great value of these ancient buildings, wherein that value consists, and what are the special dangers to which they are exposed. I now come to deal more directly with our immediate subject—our duty in respect of these ancient buildings.

I say at once that I believe our duty may be summed up in the single word "preservation"—preservation under the most favourable and suitable conditions, for the longest period possible, and for the instruction and delight of the greatest number possible. This seems very simple, and I believe few would dissent from it. It is one of those general principles which we all subscribe to most harmoniously, and fall out about the application; one of those articles of faith which we admit into our creed but translate most variously, or even seem to deny altogether, in practice. How is this preservation to be secured, and under what conditions? An intelligent autocrat could do it—to his own satisfaction; a second Solomon could not hope to do it so as to avoid adverse criticism.

As there is no autocrat to appeal to, we must endeavour to influence public opinion, and therefore I say that our first duty is to obtain ourselves, and to promote among the general public, an intelligent appreciation of the merits and value of these buildings. Here we may work both individually and in association. If the individual interest is strong, it will find its opportunities; but I may remark that I think the Association's excursions and visits to old buildings are calculated to do good in every way, both to ourselves and in directing the public attention to the subject before us. This seems to me one of the most interesting and useful parts of the Association's work and one which it does well to foster.

Then I must refer to the work of illustrating these buildings, both for reference in the study, and as a record for future use if they should unfortunately disappear. The Association has done some work in this way too, but in this connection we naturally think of the great work of Messrs. MacGibbon & Ross on the "Castellated and Domestic Architecture of Scotland," recently completed, to which we all turn with so much satisfaction. We have marvelled at the industry which the work shows, labour which in the main must have found its reward in the satisfaction it bestowed, but which we should be blameworthy did we not acknowledge with thankfulness. May I also refer to the School of Applied Art, recently opened here under such favourable auspices, which, under a properly established system of bursaries and scholarships, may yet aim at a complete survey of the whole field of ancient Scottish art, and which has already achieved something in procuring casts of the beautiful carved work of Elgin Cathedral, casts which were previously not in existence.

I proceed to say that our second duty as architects in connection with these old buildings is self-effacement. I believe the completeness of this will depend upon the fulness of our appreciation of the old work. A true and loving apprehension of all that is good and valuable in the old buildings will beget a deep tenderness and humility in dealing with them. Although one thing which marks off the work of the artist from that of the not-artist is that he finds his chief reward in the satisfaction which his work brings him, this is not incompatible with the desire for more material rewards, and surely it is natural and right that an artist should desire credit and reputation from his work. But in dealing with an old building this desire for the advance of personal reputation should, in my opinion, be entirely suppressed. A sense of responsibility to the past, whose records, and to the future, whose interests are in the architect's hands, should leave no room for the desire of public applause; and if he receives it, it should awaken the fear that he has been obtruding his own personality where loyalty to the historic past forbade.

No architect now would treat an old building as the builders of Charles II.'s palace of Holyrood treated the west front of the Abbey Church, but there are many minor offences to which he may be tempted, and which only a true love and veneration for the old structure will enable him to resist. An architect in dealing with old buildings has many a delicate task and serious responsibility, but he should consider himself a trustee of the old building committed to his care, and should place its interests before those both of himself and his client. He should always be prepared to say how far the exigencies of present requirement must bow to the duty of preserving the ancient edifice, and in the last resort, when the two things have become clearly incompatible, to say whether the value of the edifice is not such as to demand the provision of the desired accommodation elsewhere, and the preservation of the building from that time forth simply as a monument of the past.

As regards buildings that are ruinous and fragmentary, I believe the architect's duty is to see that all that can be done for preservation is done—that, and no more. For both classes of buildings his great aim should be preservation: preservation in the fullest sense, and under the most favourable conditions; the removal of incongruous and dangerous surroundings, and of excrescences which stupidity and ignorance may have engrafted on the old fabric. [In this last case it is of course clear that delicate questions may arise, as to whether one of these later growths has not acquired sufficient historic significance to make good its claim to preservation even at some loss to the old structure which it obscures or defaces, and on these questions, opinions will necessarily differ greatly.]

But, some one will say, this is a most meagre programme, your zeal for old buildings is a very tame and spiritless emotion; reckon it all up, and what you suggest amounts but to this, that we are to study them ourselves, to get others to understand and value them, to do them no harm (most offensive insinuation), and to preserve them as best we can. Is not this a most lame and impotent conclusion to what has been urged as to the great value to be set on them, and the care and tenderness to be lavished on them?

I admit the charge, but I must also admit the truth and declare it, that this most meagre programme is all that is within our power to realise. I will go further, and add, it were much, indeed, if we could realise even this. How many old land-

marks, beautiful relics of bygone ages, valuable historical documents, to say nothing more of them, have been swept away within the last fifty years, which even such a modest programme as this would have preserved to us and to our children and to our children's children.

But, it will be urged, can nothing be done to atone for past neglect; can we not take each ruined fragment and, preserving it carefully, make it the nucleus of a reproduction of the structure in its pristine beauty? Can we not take these roofless and weather-worn edifices, divorced for centuries from the life of the nation, and bring them back into contact with the active life of the community? It is a pious and patriotic aspiration—alas, that we must say, it is an impossible one! impossible, or possible only by the sacrifice of all that is really valuable in the building. When you have carried out your purpose, the associations with the past may still hover around the spot, but as far as the building is concerned, it is no longer the link with the past which it formerly was.

We have come to consider the thing, and we may as well pronounce now the baneful word "restoration," which I have hesitated so long to introduce. This is the word which, like that inadvertently uttered at some magical scene of beauty and delight, may suddenly change the whole aspect of our gathering; this is the special danger to which I consider old buildings are exposed in this century, but which I delayed to name. It is, indeed, a word of evil omen, and we should have been very much richer this day if it had never been uttered, or if the ideas which it represents had never been applied to our ancient buildings. There is, we do not deny, a certain fascination about the idea of restoring a ruined and desecrated building to its former noble proportions and richness of decoration, and most people are inclined to say that if the imagination is responsible for a few details, the piety of the intention and the excellence of the general result will cover less venial transgressions. There is no doubt that this is the popular idea of a becoming and respectful treatment of our old buildings; there is also no doubt that, since the beginning of this century, so-called restorations, conducted in this spirit, have wrought more havoc and destruction among our old buildings than any other single cause, or, it may well be, than all other causes combined. If this is so, it becomes the duty of everyone who realises it to raise his voice in warning and protest, and to do all in his power against the continuance of such destruction. The importance of this must be my excuse for trying your patience further on the subject.

Does anyone doubt that this is the popular view? If such an one only knew how often, during the last ten or twelve years, I have had urged on me the desirability of restoring the Chapel Royal at Holyrood—restoring it, that is, in the sense of rebuilding all the missing parts, roofing it, glazing the windows, and introducing the internal furnishings and decorations necessary to fit it once more for use as a Chapel Royal.

This example will do as well as another to enable us to realise what restoration of this sort actually means. The condition of the building, which is, of course, only a fragment of the old Abbey Church, is shortly this:—The aisle walls and the greater part of the west wall are still in existence. The east wall is the work of the sixteenth century. The whole of the nave arcade and, of necessity, the triforium and clerestory on the north side are gone. On the south side the nave arcade and triforium remain, but in a condition unfit to bear a superincumbent load, and the clerestory on this side also is gone. But I have often been told there are sufficient remains to show what the whole must have been, and that is indeed so, except in the case of the clerestory.

We are to build anew the missing portions. To begin with, there is the whole nave arcade, triforium and clerestory on the north side. Those who are enamoured of this sort of restoration do not seem to realise that a thing once destroyed can never be restored. It is an utter and absolute impossibility. We may produce something more or less like it, but the thing itself we can never reproduce. When we have built anew this arcade and triforium and clerestory, and thus given one entire new side to the nave, do not let us suppose that we have restored the old work; it is our work, our piers and our arches, our shafts and our carving. In the "Old Curiosity Shop" the "Marchioness" assures Dick Swiveller that when she quaffed water in which orange-peel had been steeped she could fancy it was wine if she made-believe very much. But no amount of make-believe will enable us, or anyone, to suppose that these arches and piers are the old work. We know, and everyone knows, that the clerestory is our own, and mainly conjectural, and that the triforium and arcade below it are only more or less perfect copies of the old work opposite. Without doubt, as we have a genuine liking and regard for the old edifice, we have worked honestly, to the best of our ability and judgment, and the copies are really excellent copies—perfect copies we may say, or, if not absolutely perfect, they are so in our present estimation; that is enough for us to-day, and for the present we are contented if not happy in what we have done.

Well, there our new work stands, upright and handsome,

staring out of countenance the weather-beaten and rickety old work opposite. In our secret soul we have a deep and honest affection for these venerable stones, and we would fain leave them untouched. But what would you? We have begun the work of restoration and we must go on with it. The public would never endure that this beautiful new work, which is really excellent of its kind, should be confronted by these scarred and blackened and anything but perpendicular piers on the south side. The least that public opinion demands is that they be scraped and scrubbed and freed from the dirt of centuries, and brought into something like congruity with our handsome new work, and if this be done their lack of perpendicularity may perhaps be forgiven. Let us hasten to make a compact with the demon of restoration. In order to preserve these stones where the old builders placed them let us give up their surface to be cleaned and scraped as the restorer will. Alas! we have to build a clerestory and support a roof on these anything but vertical piers, and the laws of statics, which have no veneration for these old stones, or for anything else in particular, declare that it cannot be done. We must now, as has indeed been seriously proposed to me in cold blood, take down this southern triforium and nave arcade and rebuild them so that we may have a safe substructure on which to erect our new clerestory and roof: a dreadful task for anyone who has the love of the old building at his heart. Now we begin to realise the grim truth which Ruskin has declared, that "the true meaning of restoration is destruction, the most total destruction that a building can suffer, a destruction out of which no remnants can be gathered," and that "more has been gleaned out of desolated Nineveh than out of rebuilt Milan."

I do not propose to carry our restoration of Holyrood Chapel further. I do not need to show how in this and in similar attempts to prepare a long-ruined building for occupation, even where entire rebuilding is not required, there is continual necessity for renewals which, in the aggregate, cannot fail to impair most seriously the genuineness of the fabric. We need but mention the weather-worn tracery, which needs renewal before it can be glazed; the jambs and lintels, which must be rebuilt, if not entirely renewed, before doors can be fitted to them; the parapets and wall heads, which must be rebuilt before they can be trusted with a roof or have the gutters fairly fitted to them. These and similar points will occur to us all.

But it may be urged that we have taken an extreme case, that we have taken a building the greater part of which has disappeared, and set ourselves the easy task of showing that if this is restored the result is a practically new building, possessing little of the interest which pertained to the old ruin. It may be suggested that we should take the case of a building with all its main features still intact, with much of its detail in good preservation, but in which, here and there, owing to what we may call local and accidental causes, portions have suffered decay or been destroyed; and it may be asked, is it any injury to the building, is it not indeed in every way desirable, to have these portions restored in harmony with the bulk of the old work which surrounds them?

In answer to this question let me present to you a parable. Within the last few days I have made a pilgrimage to the General Register House to look again upon a document which, since first I saw it, has kept hold most powerfully of my imagination. It is the letter sent from Arbroath on April 6, 1320, by the Scottish barons to Pope John XXII., to remonstrate against his favouring the English aggressions.

In two parts this manuscript is defective. Owing, it is believed, to the excessive dryness of the atmosphere in which it was kept for some time, two patches have within a comparatively recent period crumbled into dust. There would be no difficulty in restoring those portions in the sense in which we are now using the word "restore." The very words which are wanting are known, and there is skill available which could insert fragments in the old parchment, and write on it in the old character, and, in fact, so completely reproduce the old manuscript that not one in a hundred of the ordinary onlookers could distinguish between the old and the new. But this is not done; the precious document is simply mounted on a sheet of parchment for preservation, and carefully kept, as it is, for transmission to the generations yet to come.

I am sure we feel that any tampering with the manuscript would detract from, and not add to, its interest and value; but why do we hesitate to apply the same principle to our ancient buildings, which are in the truest sense historical documents, whose genuineness is of the first importance, and, once destroyed, can never be restored. You will remember we considered that the value of these ancient buildings consists in their intrinsic beauty, in their being examples of the art of a bygone time, but in a special manner, also in their age. On this very point of age a writer whom we have already quoted says:—"The greatest glory of a building is . . . in its Age, and in that deep sense of voicefulness, of stern watching, of mysterious sympathy—nay, even of approval or condemnation—which we feel in walls that have long been washed by the

passing waves of humanity. . . . It is in that golden strain of time that we are to look for the real light, and colour, and preciousness of architecture; and it is not until a building has assumed this character, till it has been entrusted with the fame, and hallowed by the deeds of men, till its walls have been witnesses of suffering, and its pillars rise out of the shadows of death, that its existence, more lasting as it is than that of the natural objects of the world around it, can be gifted with even so much as these possess, of language and life."

Now every interference with the integrity of a building lessens these qualities. The new work must either insult the old by a parody—as we so readily admit the work of the elder restorers to have done—or it must confuse and discredit it by closer imitations, where the more skilful the imitation, the more difficult is the task of discriminating between the old and the new, and the more discredit is cast on the whole as a monument of the past.

I assert, with the utmost confidence, that the history of past restoration is the most thorough condemnation of the whole process which goes by that name. From such complete destruction as that of the exterior of St. Giles, down through all the grades of lesser enormity, we find it the most fruitful cause of loss and injury and ruin to all the buildings it touches. I do not believe there is a single building restored during the first fifty or sixty years of this century which would not call forth an almost unanimous verdict to the effect that it had suffered great and irreparable injury in the process. In the very best the work has falsified an historical document, and taken the life and interest out of the edifice.

But, it may be said, you stop at fifty or sixty years of this century—what about the last thirty years? Ah! you tacitly admit that during that period the true art of restoration has been better understood, and that it is no longer the baneful thing you would represent!

I have omitted that period from what I have just said because we are not yet sufficiently removed from it to form an unbiassed or unanimous opinion of it: we still see the work of that period from practically the same standpoint as the men who executed it; our atmosphere of thought and taste is the same, and our preferences and dislikes are mainly the same. It were idle to deny that in our knowledge of the old work and in our ability to work in harmony with it we have advanced greatly from the standpoint of two generations ago. I see men of great skill and undoubted love for the old buildings engaged in the work of restoration—men like Scott and Street, and contemporaries of our own whom I could name, and I do not take it upon me to sit in judgment on their work. None the less do I condemn the principle of the work; and I am sure of this, that if we do not condemn their work, our children will condemn it. That which hath been is that which shall be. It flatters our vanity to think that we have learned all that there is to learn of ancient art, that we have felt its inner pulses and listened to its divine message, and that those who come after us will recognise this as fully as we do ourselves. But the restorers of sixty years ago, whose work we so unhesitatingly condemn, went about their restorations with as light a heart, and with the same delightful confidence in their own insight and perfect fitness to handle the old buildings; they received the same meed of applause from their contemporaries; and I believe that as we condemn and lament their restorations, so will the generations after us condemn and lament ours. Might not a prophet arise now and say to us, "Ye build the tombs of the prophets, and garnish the sepulchres of the righteous, and say, if we had been in the days of our fathers, we would not have been partakers with them in the blood of the prophets. . . . ye be witnesses unto yourselves that ye are the children of them that killed the prophets. Fill ye up the measure of your fathers?"

But I ask, where do you go even now with your sketch-books? Is it to the buildings which have been swept and garnished and made seemly and reputable by the hands of the restorer, or to those scarred and weatherworn remains where you have yet the very work of the old masters—"what their hands handled, and their strength wrought, and their eyes beheld"? And when you pass by some building which has lost all living interest to you through the mistaken kindness of the restorer, do you not find a response in your own heart to the pathetic words of Ruskin in his preface to the 1880 edition of "The Seven Lamps of Architecture"? What he says is: "I never intended to have republished this book, which has become the most useless I ever wrote; the buildings it describes with so much delight being now either knocked down, or scraped and patched up into smugness and smoothness more tragic than uttermost ruin."

I plead, therefore, most earnestly for the careful preservation of our old buildings, and, above all, for their preservation from "restoration."

I maintain that restoration is only admissible where there is no possibility of its involving destruction, and that this condition can only be assured where there is nothing to destroy. I consider that the reproduction of our old market-cross was a

legitimate restoration and a most graceful act, but to those who still urge upon me the restoration of Holyrood Chapel I would say: My kind and well-intentioned friends, here is a vacant piece of ground, and here be masons and stones and mortar. Set ye to work and make the very best reproduction of Holyrood Chapel of which you are capable: so shall your desires be gratified and so doubtless shall a thing of beauty arise to gladden the eyes of men: and so also shall these venerable stones, which have survived the decay of seven centuries, the evil entreaty of invaders, the neglect and cupidity of their own sons, the shock of faction and of civil strife, the ignorance and stupidity of unworthy custodiers, and the rain and frost and lightnings of heaven, still remain for many years to tell their story to the generations following us.

I plead for preservation—for watchful and affectionate preservation. Suffer one more quotation from Ruskin, which most admirably, as I think, sets forth what can thus be done:—"A few sheets of lead put in time upon a roof, a few dead leaves and sticks swept in time out of a water-course, will save both roof and walls from ruin. Watch an old building with an anxious care; guard it as best you may, and at any cost, from every influence of dilapidation. Count its stones as you would jewels of a crown; set watches about it as at the gates of a besieged city; bind it together with iron where it loosens; stay it with timber where it declines; do no care about unsightliness of the aid; better a crutch than a lost limb; and do this tenderly and reverently and continually, and many a generation will still be born and pass away beneath its shadow. Its evil day must come at last; but let it come declaredly and openly, and let no dishonouring and false substitute deprive it of the funeral offices of memory."

In conclusion I plead once more, and on this we shall all agree, for an earnest and loving study of these old buildings; so shall the heart oftentimes redress the errors of the judgment. Like all proverbs, the saying that love is blind expresses but a half truth, and it has no application here. Love bestows a keenness of vision which nothing else can give, and we shall be least likely to misread the lessons of the past, or to mistake our course in the present, if it can be said of us—

Thy saints take pleasure in her stones,
Her very dust is dear to them.

LEEDS ARCHITECTURAL SOCIETY.

ON Monday evening a meeting was held at the Law Institute, Albion Place, Leeds, when Mr. H. V. Lancaster, A.R.I.B.A., gave a lecture entitled "Some Remarks on Colour Decoration." Mr. G. B. Bulmer presided. The lecturer gave a brief historical review of the principles of colouring observed in the decorative art of Egypt, Assyria, Greece, Rome, and of the later Venetian and Florentine schools; and then proceeded to deal with the decorative work of our own times, pleading for the adoption of a system of crafts rather than of trades, and so obtaining a more intimate association between the work of the architect and of the craftsman. A feature of English decoration, he said, was that it produced a "closed-in" effect, whilst the Italians, with their love of outdoor life, had always avoided such a sensation in their decorative work. He discussed under different heads the various means adopted in this country to produce our decorative effects, their history and possibilities. The architect, he said, to begin with, must at least have a thorough grasp of the *tout ensemble* of the effects which he was producing; and the craftsman should be imbued with a sense of the character of the work in which he was taking part, so that it would become artistically impossible for him to materially err in his treatment. The spirit of modern commercialism, however, had dictated that buildings should be decorated under totally different conditions; and a man of the greatest skill would find it difficult to co-ordinate his work when, perhaps, a hundred miles away from it, and with only the haziest notion of the structure he was dealing with. The architect should get thorough control over his work, drawing as much as possible with his own hand. Of course, it was not to be expected that he should have the same command of resources as the painter or sculptor, but he could bring their feeling into touch with his own by means of sketches, and thus secure that their technical skill should be used in a direction which would enhance the total effect. One could imagine that where an architect had the opportunity of training a body of craftsmen under his own eye, and of working with them for a protracted period, mutual interpenetration of ideas was most likely to be arrived at. And, where possible, this was the most desirable system to put into operation. But in the present hurry-scurry days the architect was expected to push everything through at the greatest possible speed, making use of all the facilities which the tradesman placed at his disposal. This meant the subdividing of work to such an extent that it was impossible to get into personal touch with all those engaged in it, and the architect must either indicate precisely

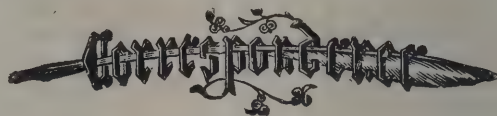
his intention or lose considerably in the translation of his ideas. In the first case, it was obvious that he must be content with a limited field of action, and in the second, with an approximation only to the character of the work his individual taste dictated, whereas by the gathering together of the group of workers one got the fullest power available. The lecturer described the various materials employed in decorative work, and their colour and characteristics. A hearty vote of thanks was accorded to Mr. Lanchester.

MANCHESTER ACADEMY OF FINE ARTS.

THE annual meeting of members of the Manchester Academy was held on Monday. Mr. Clarence White presided. The report stated that after the resignation and decease of the president, the late Mr. Robert Crozier, a period of twelve months elapsed without the appointment of a successor in the presidency, and at the last annual meeting Mr. Henry Clarence White was unanimously elected president. At the same meeting Mr. W. Percy was elected an honorary member of the Academy. The ballot upon the several applications for Associateship did not result in any addition to the list of Associates, nor did the subsequent ballot for membership increase the list of members. One member and two associates—Mr. Yates Carrington and Messrs. John Taylor and Chris. Blacklock—had died during the past year. The number of members therefore was 44, honorary 12, and associates 32. There were also 32 students for the current session, 21 ladies and 11 gentlemen. At the close of the life classes last session the Council examined the works submitted, but declined to award any free studentships. During the current session the life classes had been efficiently maintained, notwithstanding the multiplicity of exhibitions and the large increase in the number of claimants for popular approval. Being desirous of raising the position of the Academy and extending its influence, the President and Council had initiated a scheme for the formation of a body of annual subscribers to the funds of the Academy. They believed that this would eventually place the Academy more in accordance with its aims and needs. The movement, in the judgment of the Council, would be successful and would place the Academy in a position which would enable it to exercise a greater influence on the art culture of the district, and become an institution alike honourable to and honoured by the manufacturing metropolis of England. The treasurer's statement showed expenditure on the exhibition account 533*l.*, leaving an adverse balance of 10*l.* The revenue account showed receipts 226*l.*, and a favourable balance of about 70*l.* On the motion of the President, the report and balance-sheet were adopted. The President stated that twenty-six annual subscribers had already been secured, and that they included some of the best names in the country. This was a very good augury for the success of the movement. All the officers were re-elected as follows:—President, Mr. Clarence White; vice-president, Mr. Reginald Barber; honorary secretary, Mr. W. Robinson; literary secretary, Mr. Bruce Wallace; treasurer, Mr. W. Artinghall. The following were elected members of the Council:—Mr. H. Johnson, Mr. H. Hague, Mr. J. H. Davies, Miss Dacre and Mr. Byron Cooper.

THE SURVEYORS' INSTITUTION.

AT the meeting of this Society on the 20th inst., Mr. G. M. Freeman read a paper on "The Arbitration Act, 1889." He described the Act as of great practical importance to two classes of professional men, lawyers and surveyors. It had worked considerable changes both in the procedure and results of arbitration. Nevertheless, its scope seemed to be imperfectly understood. Had its real meaning and machinery been grasped, he did not think surveyors would have heard so much as they had lately heard as to the delay and expense of arbitration, nor did he think that curious creation of the City brain, the Commercial Court of Arbitration, would have been devised. The aim and end of the Act was to make arbitrations speedy, final and economical, and since it had become law, if any man was harassed by delay or vexed by undue cost in arbitrating his differences it was entirely his own fault. The Act dealt with two classes of reference, compulsory and voluntary. The submission of the latter to arbitration embraced all those cases where, in order to avoid the law's delays, men might agree to refer their disputes to some third person in whom they had confidence, and that was the part of the Act which mainly concerned surveyors from a practical point of view. One of the great objects of the Act was to prevent improper delay, and summary methods were introduced for upsetting any dilatory tactics on behalf of either party. Under its provisions, arbitrations had been conducted with smoothness, terminated with alacrity, and paid for with the minimum amount of grumbling.



Launceston Priory.

SIR,—With reference to the interesting proposal in your columns as to Launceston Priory, I should like to state for the benefit of Cornish and local antiquaries that a MS. in Lambeth Palace Library, No. 719, contains several charters, grants, declarations, &c., relating to this Priory. There is one which relates to the repair of the chancel and several "compositions" between the bishops of Exeter and some of our kings as to lands monastic and otherwise in Cornwall. Most of the documents appear to be careful transcripts from the originals, and the volume has the additional interest of the signature on the parchment page of the first Prior of Launceston; the rest of the book is written on paper. If any historical account of Launceston Priory is contemplated in connection with the preservation of what remains of the building, reference should be made to this valuable MS., portions of which were incorporated in Sir John Maclean's excellent "History of Trigg Minor" in Cornwall. The scheme of conservation so ably advocated in your last number will, I trust, meet with its well-deserved success by all antiquaries, both in the West of England and elsewhere, and by Cornish residents in London.—Yours faithfully,

S. W. KERSHAW, F.S.A.

Lambeth Palace Library :
February 22.

GENERAL.

Mr. E. Burne-Jones has resigned the Associateship of the Royal Academy.

The Spring Exhibition in the Leeds City Art Gallery was opened to the public on Tuesday, and was well patronised, despite the unfavourable nature of the weather.

Mr. James Reid, president of the Glasgow Institute of the Fine Arts, has been unanimously elected honorary president of the Scottish Artists' Benevolent Association.

The Society of Painter-Etchers will open the annual exhibition at the rooms of the Water-Colour Society on Monday.

The Erection of the Barracks for the Medway Steam Reserve at Chatham was commenced on Wednesday. The outlay will be about 60,000*l.*

Mr. George Clarkson, late of 341 Holloway Road and 38 Great James Street, Bedford Row, surveyor, who died on November 1, has left property worth 140,000*l.*

A Committee of the Leeds Corporation have recommended the construction of five swimming-baths in the city at a cost of 8,000*l.* each, exclusive of sites.

The Town Council of Louth will elect a borough surveyor in the course of next month.

Dr. R. Rowand Anderson, at the meeting of the Edinburgh Architectural Association on Thursday, opened a discussion on the paper, "Our Duty in Respect of Ancient Buildings," by the President, of which a report appears on another page.

A Site has been secured for the Keighley and Bingley Joint Hospital.

Mr. Heber Rimmer, Soane medallist, will read a paper on "Renaissance Architecture of Spain" at the meeting of the Liverpool Architectural Society on Monday, the 27th, which will be illustrated by sketches and photographs taken during his recent tour.

A Special Meeting of the new infirmary committee was held on Saturday, at Southport, to consider what action should be taken with regard to the plans of the new infirmary. The plans by Mr. C. S. Ingham, of Southport and Manchester, were accepted, and it was intended that the cost of the building should not exceed 13,000*l.*, but the lowest tender for the work amounts to 24,000*l.*, the highest being about 28,000*l.* The committee were unable to arrive at a decision.

Major-General Sir R. Murdoch Smith, director of the Museum of Science and Art in Edinburgh, on Tuesday evening delivered a lecture on "Persian Art in relation to Persian Life and Character" before the Edinburgh Philosophical Institution.

An Anonymous Donor has offered to meet the cost of entirely restoring the parish church, St. Mary's, Kidderminster.

The "Art Journal" for March will be an unusually strong number. In it will begin the series of articles on Mr. Henry Tate's pictures recently offered to the nation, and the chief illustration is an etching of Millais's picture, *The Vale of Rest*, besides other engravings. This picture has never before appeared in black and white.

The Architect.

THE WEEK.

It is to be regretted that the decision which was given by Mr. Justice NORTH on Tuesday, in *TYNDALL and Others v. CASTLE*, cannot be made a general rule instead of applying merely to a special case, for it would prevent many injuries to their neighbour's property by people who believe that they can do what they like with their own land. In the case in question, which related to the Camden Park Estate, Tunbridge Wells, there was enough to show that when the three plaintiffs purchased plots, they had reason to believe that a certain character possessed by the estate was to be retained. The conditions of sale enjoined that the houses to be erected should not cost less than 1,200*l.* each, and the land was not to be turned to account for business purposes. Certain stables that were allowed had to be screened by trees and shrubs. After the conditions had been observed for over thirty years, the defendant bought a part of the estate, and sublet it for a market garden; he also cut down the screen of trees, and erected cottages on the site of a lodge. One of these acts was considered by Mr. Justice NORTH as a departure from the covenants, but the others he held affected the plaintiffs, who were entitled to the benefit which arises when an estate is laid out as residential. Injunctions were, therefore, granted to restrain the defendant from using his property in such a way as would diminish the amenity of the plaintiffs' properties.

AN ecclesiastical broil which has disturbed Lourdes, and which is likely to furnish a chapter in M. ZOLA's forthcoming romance, has been settled. The village possesses no less than three churches which are erected at different elevations. One was constructed by the Abbé PEYRAMALE after the events which imparted interest to Lourdes. The bishop of the diocese entrusted the direction of the place, which was the goal of pilgrimages, to special priests, who took possession of the new building. Then the Abbé, who to some extent was deprived of his influence, undertook the erection of a new church which was to serve instead of the tottering parish church. After a time the collection of funds for the work was interdicted, and the Abbé was compelled to dismiss the workmen. After his death the relatives of the Abbé decided to set up his tomb in the incomplete building, as a protest against the action of the bishop and his clergy. The successor of the Abbé, the official parish priest, appears to have been declared liable for the cost of the work already executed, which is 600,000 francs, and, to escape the penalties, the church has had to be left unfinished as if it were nobody's property. Meanwhile, the third church, which is the original parish church, remains a ruin. The priests who have charge of the church which the Abbé PEYRAMALE was able to complete, and who are now dominant in the place, offered to restore the old parish church or to complete the Abbé's second church out of the gifts of pilgrims, but it was on the understanding that the architect and builder should renounce the claim to the 600,000 francs. It is needless to say that proposal was not accepted, and they must be infatuated pilgrims who could believe that it is a holy or wholesome act for any religionists to evade the payment of a just debt. Fortunately for the credit of the place, an unexpected benefactor has turned up. A Dutchman who, like many visitors, was dissatisfied with the imbroglio, has, it is said, offered three millions of francs to the bishop of the diocese to complete the church. It is to be hoped the first use that will be made of the money will be to pay the debts for the work which has been executed.

THERE can be little doubt that the sanitary condition of many among the London Board schools is worse than may appear from the formal reports of the officers. When we find the Assistant Architect for Repairs saying, "I am of opinion, from my knowledge of the buildings, that when the drains are interfered with and exposed a great deal more work will have to be carried out than the reports imply, and the clerks of works' estimates will in many cases be exceeded, because where defective drains are seen to

exist the local authorities will compel their renewal," it is not difficult to imagine that concealed dangers exist which are not to be removed without much cost. The Works Committee have agreed that quantities be not taken out for the drainage works, which is also an indication of the difficulty of the work. Additional clerks of works and draughtsmen have to be employed, and the Works Committee ask to be authorised to employ in the worst of the drainage cases one or more sanitary engineers to superintend the carrying out of the necessary and costly works. It is no doubt hard that the existing Board should have to bear the responsibility for defects that are appalling, but as long as they appear disposed to screen the culprits they must accept the consequences.

THE Bill introduced by Mr. BIDDULPH MARTIN, Dr. CAMERON, Dr. FARQUHARSON, &c. proposes to secure the sanitary registration of dwelling-houses, schools, colleges, hospitals, asylums, workhouses, factories, workshops, hotels, lodging-houses and other buildings. Local authorities are to become the sanitary registration authorities. Each of them shall appoint the clerk or some other person as sanitary registrar. Previous to June 1, 1894, notices are to be sent to the owners, lessees, sublessees and occupiers, demanding that all buildings in the districts are examined, and certificates of the condition signed and sealed by a licentiate in sanitary practice. After January 1, 1896, certificates are to be furnished for all new buildings. The licentiates are to be members of the Royal Institute of British Architects, the Institution of Civil Engineers, the Association of Municipal and Sanitary Engineers and Surveyors, the Surveyors' Institute, or (2) architects and engineers who have been in practice five years at the passing of the Act; (3) members of sanitary associations; (4) medical practitioners registered as qualified in sanitary science; (5) medical officers of health; (6) engineers and surveyors under the Public Health Acts; and (7) persons who have been declared qualified to design and carry out constructive sanitary works. The last class will have to pay a fee not exceeding five guineas for a license, the other classes can obtain licenses free of charge. The various bodies mentioned can hold examinations and grant certificates of competency at a charge not exceeding three guineas. In every building the sanitary arrangements must comprise a flushing service for each closet, ventilated soil-pipes, traps, air-chambers, &c. After January 1, 1895, buildings are not to be used unless they are certificated. The penalty for giving a false certificate may be 10*l.* or under, and a similar penalty may be imposed for letting or occupying an uncertified building. After five years the certificates will require renewal.

It is generally supposed that Americans are sensitive to the absence of antiquity in their country, and that is supposed to be one of the reasons for the attractiveness of England with them. We regret to find, however, that they are not sufficiently reverential about the examples which, if not of hoar antiquity, are at least surrounded by many delightful associations. According to *Architecture and Building*, just now "Elmwood," the home of LOWELL, the American poet and writer, whose life and work will ever occupy a prominent place in American literature, is in danger of destruction. His home bears upon it the legend, "To let for house lots." There are some people in the old Commonwealth who are reluctant to give this property over to the spoiler, and a formal organisation is likely to be created for its preservation. There are many reasons, not only from a literary but an historical standpoint, why this structure should not be swept away by the advance of "modern progress." From an architectural point of view it should be kept as an example of the best colonial architecture. It and the old Craigie House, LONGFELLOW's home, are of Revolutionary fame, and were centres of the best colonial social life. This house was the home of old ELBRIDGE GERRY, Governor of Massachusetts. Here he was visited by 4,000 citizens of Boston when he had incurred their displeasure. If Americans allow the iconoclastic spirit of the speculative builder to pursue its course unchecked, they will soon be a nation without "heirlooms."

RENAISSANCE ARCHITECTURE IN ENGLAND.*

WHEN the American traveller said that England resembled the Soane Museum because it was so well packed with good things, he was speaking truth to an extent that a stranger could not realise. Whatever demands are made on the treasures of the country they can be met. Annual exhibitions of old masters have not exhausted the masterpieces of painting. The loan collections can offer surprises to the most knowing of connoisseurs. There are few districts in the provinces from which an energetic committee could not provide materials to set up an exhibition, no matter how various may be the sections. It was lately announced that the Roman Catholics propose to organise one which will be restricted to objects having more or less relation to the practices of their religion, and it may be safely assumed that in spite of all that was done in penal days to destroy the aids to any devotion that was illegal and to punish the men and women who employed them, a supply is sure to be forthcoming that will be sufficient to fill several galleries. It would be no less easy to exemplify other forms of belief by the aid of English hoards, and indeed all classes of literature, all arts, all employments connected with peace and war can be illustrated out of the collections in English houses. If we were cut off from communication with the rest of the world our exhibitions would not on that account cease to be interesting; artists, archaeologists and amateurs would have no reason to despair.

England possesses so much Renaissance architecture that the contemplated number of plates in the work of Messrs. GOTCH and BROWN is insufficient to hold the more prominent examples, and when it is completed there will be sixteen additional plates. Who knows whether the authors may not be tempted to enrich the world with another work on the subject? Numerous as are the plates, they do not comprise all that remains to testify to the strength of the Renaissance spirit as shown in work which has survived the whims of fashion and the mutability of fortune. But whatever may be attempted hereafter, the buildings which have been presented are all most interesting, and the fifth part is in no way inferior in the quality of the contents to those which have preceded it. The subjects are, as before, mainly secular, viz. Conover Hall, Moreton Corbet, Tixall Gateway, Aston Hall, Brereton Hall, St. John's Church, Leeds; Fountains Hall, Burton Agnes Hall, Gilling Castle, Temple Hall, Wakehurst Place, Cobham Hall, Hatfield House. Every one of the buildings is worth an essay, but we must restrict ourselves to a few very short observations on them.

The entrance front of Conover Hall, in Shropshire, shows a large mansion with projecting wings (having windows on the returns) and a projecting porch. There is an avoidance of any feature that would appear pretentious. With the exception of the semicircular head to the wide hospitable door, and a few small circular sunk panels in the gables and elsewhere, it may be said that only straight lines are used. The band of ornament in the frieze on the ground storey is not continuous, being confined to the parts over windows. We must, however, believe that the designer was an artist and knew the value of moderation.

CAMDEN, writing in 1607 of Moreton Corbet, describes it as "a castle of the CORBETS, where, within the memory of man, ROBERT CORBET, to gratify his curiosity in architecture, began a noble building, much more large and splendid than the former, but death countermanding his designs took him off, and so his project was left unfinished." The house is in ruin. If the design came from an amateur, it must be allowed he knew the value of shadows. Instead of flat pilasters almost complete columns are attached to the walls, Tuscan on the ground storey with Ionic above, and they are contrasted on the front with a moulded projection of about the same depth as the columns, and surmounted by a sort of twisted Elizabeth ornament that might be called a half-cap. The text says, "the mixture of corbel and foliage at either side of the head of the main window is an ill-contrived finish to the mouldings from which they spring," but the arrangement

has the effect of compelling the spectator to take in both sides in his view, and to regard the window as a whole. A complete Classic or other capital at each side would have more correspondence with precedents, but is it absolutely necessary for a symmetrical arrangement that each half must be complete and independent? On the sides of the door very small flat caryatids were used, but at some of the angles animals or heraldic supporters were introduced under the columns. They are like some of the literary innovations of the age, more ingenious than reasonable. The Gatehouse at Tixall, in Staffordshire, might have been designed as Moreton Corbet, and it was wise to bring the two together. The angles are treated as turrets, and so enhanced the effect of the more ancient mansion to which the structure was the approach. There are two storeys above the entrance, and, as is pointed out, "the triglyphs under the bay windows are curved outwards and made to do duty as corbels." The windows are flanked by coupled columns arranged on the regulation principle, supporting Tuscan, Ionic and Corinthian.

The people of Birmingham may well be proud of the possession of so important an example of a Jacobean mansion as is Aston Hall. Seventeen years (1618-35) were required to complete the building; but the HOLT family took possession of it in 1631, and the authors of the book have, we supposed, lost faith in penalties, for they believe the HOLTS adopted "the only method by which it seems that workmen can be expelled from a new house, namely, by the family going to live there before it is finished and contesting the rooms inch by inch." There is little doubt the designer was JOHN THORPE, but his plan was not exactly adhered to in construction. The building is one of the best known of its class, and the skilful arrangement of the parts must strike all visitors. It is pointed out that the detail and disposition reveal a late feeling, and that a feature which was common is happily preserved, viz. the open court, with the walls projecting from the wings and the lodges at the ends.

It is supposed that Queen ELIZABETH laid the first stone of Brereton Hall, in Cheshire. The building suggests a sort of compromise between aspirations after comfort and the display that was allowable in the head of an ancient family. The central part, by means of its double series of armorial bearings and its turrets, which are made more emphatic through their connection by means of an arch, has a sort of feudal character; the rest of the hall is simply treated.

The Tudor Reformers started under circumstances which later creators of religions must have envied. By taking possession of churches and cathedrals they were saved expense and trouble. Their sense of fitness was not disturbed by the incongruity of employing buildings for a ritual for which they were not intended. There is no doubt that one of the consequences was the creation of false principles in church architecture, which were not without baleful influence on secular architecture. JOHN HARRISON, the merchant who built the church of St. John, in Leeds, about 1633, therefore merits most grateful remembrance for being one of the first who did not believe in second-hand churches. It shows, however, the degradation which followed on the penurious policy of the Reformers when we find that the architect was unable to seize his opportunity and build a church in which there would be correspondence between it and the services. It "follows Mediæval precedent in its main lines, though the detail is Jacobean." The devious policy of the time is suggested by the fact that, although built for a Protestant ritual, yet, as the authors record, "Protestantism was not to be carried too far, for the preacher of the sermon in the afternoon of the day of consecration, one Mr. TODD, the first incumbent, was promptly suspended by the Archbishop for Calvinistic teaching." It is not altogether satisfactory that when one recalls the church it is always the screen which first comes before the mental vision. It is undoubtedly a remarkable example of its class, and it does much towards making the church attractive for those who are in search of the picturesque. But what was the motive which originated it? Unless to secure a select chapel for one class of worshippers, it has no apparent use. We believe Mr. NORMAN SHAW was associated with the restoration of St. John's, although his name does not appear in the text.

* *Architecture of the Renaissance in England.* By J. Alfred Gotch and W. Talbot Brown. Part V. (B. T. Batsford)

For Fountains Hall, which comes next, what would be called an eligible site was selected, for "it is situated on so abrupt a slope that the first floor at the front becomes the ground floor at the back." It is not a fascinating example. Statues were employed to increase the importance of the house, but the figures are out of scale, and are mere journeymen's work.

The authors have assigned four plates to Burton Agnes, and they are not too much for the example. The house was built at the beginning of the seventeenth century, and brick was employed in preference to stone for the walls. The hall is in the centre of the building, but the entrance is at the side of a projection, and a similar projection is employed for the sake of uniformity. The central part is therefore on two planes, beyond which extend the wings with bay windows. The dressings are of stone. The state bedroom is elaborately panelled but the commonplace modern grate detracts from the effect. The quantity of timber used in the staircase would scare a surveyor. It is ingeniously arranged so as to afford, as it were, a number of vistas, and the greater part shows ornament in relief. There is a gatehouse, on the front of which the Royal Arms appears on a large scale.

Middle Temple Hall is always a welcome subject for an illustration. It could hardly become so interesting on account of its associations alone; the architectural character of the hall counts for much in men's minds. Like the law with which it is associated, the hall has little unity. The style of the masonry differs from the style of the woodwork. But a student fresh from Slade lectures at his University would not be much concerned about the clashing of styles; he would prefer to realise that the compound mass, with all its defects, is suggestive of a wealthy and powerful corporation that need not be anxious about the present or the future. The superabundance of ornamentation seems to be a necessity, for with a limited area to work in and an abundance of money and goodwill, what can be done except to impart costliness to every inch of space? It is a wonder the Benchers have not gone farther in the adornment of their hall. There is no need to point to the defects of the sixteenth-century designers; they would not be repeated in our time, but where is the money to be found that would raise a better hall?

It is strange that Sussex can offer us no better example of an Elizabethan or Jacobean house than Wakehurst Place. Not that the building is without interest, but from a county of so much importance we might expect something that would compare with the best examples of the style. It might be called a many gabled house, for every window in the two principal storeys has a corresponding dormer in the roof, which is surmounted by a gablet. The merits and defects of the treatment are thus described by the authors:—

The richness of effect is produced by tolerably simple means: by pinnacles and strings and sunk panels and other work which a mason could do without calling in the special skill of a carver. Nevertheless, the result is striking and unusually rich. Here, as in so many buildings of the period, the designer had an ill-balanced hand, for the details of the bays and strings are far more refined than that of the dormers. One naturally says "designer," influenced by the customs of to-day; but it is quite likely that in reality different men did the work, providing their own details, and that this accounts for the difference in treatment. Two other points are to be noticed about the bays: first, the fact that they are placed in a corner, so that one canted side looks on to the wall of the wing not three feet off. Second, the change from the canted bay to the square dormer over it is very difficult to manage successfully. Here it is done by means of a bracket, which, although an agreeable change from the ordinary corbelling, still leaves something to be desired in point of grace. It is a feature which pleases us in an old building, but would probably rouse our adverse criticism if adopted on the glaring stone of new work. The numerous dormers and gablets, each with its three panels, are exceedingly picturesque, and the treatment of the main gable, with the double step on the coping at its foot, is worth notice. The ruling desire for symmetry has led to the insertion of windows which are not only not wanted, but are in the way, and the middle window at the side of each wing is a sham, the disposition of the rooms inside not permitting of its going through the wall. This is a great defect in the design, and one which need not have been incurred, for not only does a natural and logical treatment carry its own defence with it, but plain spaces of walling are of great value in giving repose and enhancing the value of whatever ornament there may be.

Views are given of the north front and porch in quadrangle of Cobham Hall, in Kent, with one of the chimney-pieces. Unfortunately sham windows, which were one of

the consequences of a belief in Classic symmetry, are to be seen in this building. The mansion has also undergone alterations, but it still has enough about it to make it one of the most valuable survivals of a famous age.

The fifth part closes with plates of Hatfield House. There is no part of the building of more antiquity than 1611, but there is much of later date, which appears to be old. In spite of the interest which belongs to it the authors are forced to conclude that "there are not many piquant features about the house; it is a large and stately building, and depends for its effect upon size and symmetry rather than upon varied and charming detail." The great hall, the grand staircase and the long gallery are the parts which obtain most attention. In referring to the correspondence between the Lord SALISBURY for whom the house was erected and his foreman, the authors say the letters point to the practice of the seventeenth century, that is, "to the employment of independent workmen for the various trades; to the supervision of a local foreman with an occasional visit from a surveyor; and to the proprietor himself being the controlling influence in most of the matters which are now left to the decision of the architect." One consequence is that the research of the authors has not enabled them to discover the names of more than a very few of the designers who were associated with the buildings selected for representation. In spite of this drawback, the buildings must excite the interest of everyone who cares about the architecture of England, and Messrs. GOTCH and BROWN have earned the gratitude of their countrymen by their earnest efforts to demonstrate that in Renaissance as in Gothic we have some claim on a style.

THE INFLUENCE OF ART.

AT the annual distribution of prizes to the students of the Birmingham Municipal School of Art, an address was delivered by Mr. Holman Hunt. He began by recalling the original purpose of the provincial schools of design. Haydon, who first gained the conception of their necessity, saw that a strong national taste for design in manufactures and architecture, which in earlier days had existed—a taste which in the previous generation had culminated in goldsmiths and silversmiths' works from the invention of Stothard and Flaxman, and in ceramic ware of Wedgwood make—had suddenly disappeared, and had been replaced by the ugliest and vulgarest forms that had ever appeared on the civilised earth. It was not Haydon's purpose, therefore, that the movement he set on foot should result in an unreasonable increase in the number of painters of canvas and carvers of stone. It was a favourite canon nowadays that the object of all arts was to give enjoyment. That dictum should be so far qualified as to insist that the enjoyment should be of an enduring kind. Many of the newest—perhaps he ought to say the most advanced—schools in the profession would hoot him down as quite a perverse oracle; but he spoke as one who had outlived many storms, and as being bound to advise his successors according to his best convictions, without regard to the immediate popularity of his views. The English, as a nation, had up to the present day won the right to admiration for their art as spiritual, healthy, poetic, beautiful, and withal innocent, and he would urge students to honour those merits which made it distinct from our neighbours' art, and to take pains to retain that native individuality, and strive even to make it richer with those manly characteristics. A few years since, at the home of the great naturalist, Sir Richard Owen, he met his remarkable neighbour, Sir Edwin Chadwick, who began a conversation thus:—"As a commissioner of health, I must profess myself altogether opposed to the artistic theory of beauty. There is the Venus de Medici, which you artists regard as giving the perfect type of female form. In my view the figure is far from admirable. I should require that a typical statue with such pretensions should bear evidence of perfect power of life, with steady prospect of health, and signs of mental vigour. She has neither. Her chest is narrow, indicating unrobust lungs, her limbs are without evidence of due training of muscles, the shoulders are not well braced up, and her cranium and her face, too, are deficient in all traits of intellect. She would be a miserable mistress of a house, and a contemptible mother." And he ended the denunciation with, "Such kind of beauty I can't admire." When the listener assured the sage critic that he had made a most artistic criticism of the statue, and that his auditor would join in every word as to his standard of requirements, he knew that he was talking heresy to the mass of persons who accepted the traditional jargon of the *cognoscenti* on

trust. The fact was that the work belonged to the decadence of Roman virtue and vitality, and its merit was alone in the rendering of a voluptuous being without mind or soul, all unlike those noble figures in marble which the Greeks and Romans of earlier times left. When any insistence upon the duty of making art more than merely diverting to the senses was uttered, it was assumed that the doctrine enunciated was that at all times some especial moral or religious lesson should be enforced. He would by no means be understood in that sense; but he challenged anyone to deny that there were creations offered in the guise of art which were altogether unsound, flippant and immoral, and that they were produced by a school which ridiculed the claim that art should do more than beguile the idle fancy. From that view his own entirely differed because, seeing that the work would take a message of some sort to everyone who had eyes, it was simply Cain's contention that he was not his brother's keeper. The object of an artist should ever be to determine what was good on the sole ground of propriety of design, for that in the end would eliminate all that was base, and help the world to laugh to scorn all false pretension in the artist, whatever the theme might be to which he devoted his energies. Mixed up with much beautiful ornamentation among the remains from Pompeii were specimens of very nonsensical combinations in decorative art. Modern artists, too, often unthinkingly followed ancient ornamental style, imitating not the admirable spirit alone, but copying details with servile deadness. As an example, he might mention the frequency with which in stained-glass windows the clumsy proportions of Mediæval figures were given. His purpose that evening was to judge what the result of the taste inculcated by all art offered to the public would be. Would it tend to elevate or to lower a people taught to look upon it as beautiful? What a people admired, that it assuredly became. He who satisfied his eyes with the beauty of the degraded would have degraded offspring. Licinius knew that if men's intelligence grew used to seeing incongruity in ornament, their whole ideas of propriety would be disturbed, and their disordered minds would become receptive to other falsehoods. Art therefore was part of a nation's—aye, of eternity's soul. Some people were prejudiced against every appeal for art. They tacitly encouraged the thought that any indulgence of the taste should only be in a playful mood, and were quite ready to see art treated in the press as a kind of mountebankism, in which the merits of the conjuror were best proved by his smartness and noisiness, and by the number of coins the vulgar idler threw into his ring, and such responsible bodies as the Government and the Church found justification for avoiding it altogether. What was done for the little section of the latter which indulged in affected Gothicisms could not be considered as having anything to do with intelligent art. In truth, the pursuit of art should take its place among the sacred duties of the realm. All great nations had to leave an intelligible inheritance, one which had grown out of their own peculiar nature, in its siftings of the chaotic soil of the earth. The opportunity for art in a nation's life came but once, and lasted but a short time. Our own art was late-born. It had been only for private demand. It had never been extendedly national, for it had never developed its proper decorative branch. Dilettanteism had often misdirected it. Yet it had justified its right to stand even on the great throne dais which the race in its noblest children had built for poetry. He had to utter warnings lest at this moment what our fathers had gained we should lose. Of what value to their successors was the art of ancient nations? Few men of letters would refuse to admit the eternal worth of the works of the Assyrian sculptors. In the Greeks we found an elevation of insight of which there has been no foreshadowing, except faintly in early Egyptian times. The excuse pleaded for the later Egyptian artist was that he was by the priest ever hampered and hindered from the exercise of his higher ability. The submission proved the inferiority of nature. The Greek had too high a sense of the value of beautiful form to be restrained until he had reached perfection in his art. The ornamentalist took certain patterns in vogue from Egypt and Assyria, but in his hand they quickly grew into new life, and branched out into fresh streams of freshness and beauty. His treatment of the figure was equally independent. Every Greek, entering fully into the importance of the gymnast master's aims, and those of the physician who treated the tyro athlete, was prepared to understand the ambition of the greatest artists to reach from the earliest endeavour by patient strivings the matured glory of form of the perfect man. It seemed as though they, too, with the strange Hebrew nation, sought to teach that man was made in the image of God. This service was a sacred one, of great practical value to Greece, and ever since to the world. It taught us to sift away all artificial fashions, vanities of taste, all weak prejudices for superficial prettinesses which led weak taste to wrong judgment about form, and it led men to value as beautiful those proportions and shapes only, and that mien, that kingship of bearing, coming from habitual self-government, which together were the marks of the heroic race, marks

distinguishable in a nation which was master of its fate and teacher of future nations—

For 'tis the eternal law
That first in beauty shall be first in might.

This great fortune left by the Greeks was never gained by any *dilettante* trifling or the whims of the luxurious. The people watched the progress of each fresh discovery with rapture. It formed the diploma of the nation. It had helped the world ever since to love the hero, and to no nation had it taught the lesson more than to England, where a feminine man, a *petit maître*, a man helpless in difficulty, one who could not throw off his coat and reveal strength and firmness, had ever been despised. In this disquisition it might be interesting to note that until after Phidias the nude female figure was never represented in sculpture. The type of womanly grace was achieved in such holy spirit that it had stood ever since as a protest against every modiste's perversion of true form. Without it we might perhaps have adopted the Chinese contracted foot. We did sometimes have minor evils, but even the Greek standard of true womanliness rose up and shamed the attempt to distort it. But it was not the modiste alone that threatened evil. Often the canker came with the poetic strain that smelled of the midnight lamp, that dealt with the sickly and the morbid, that made melancholy and death alone its atmosphere—a poetry cultivated not by the hero, who loved life despite all its troubles, and who determined to lessen these, who glorified nature by the overflowing of his joyful and trustful heart—not by such a son of life, but by an egotist who had learned the words and counted the rhythm of the master songman in order to scatter his deadly tares in the field of the bread of life. How many failed to be proof against the insinuating deceit! How often the pernicious mood was adopted by the artist and the plane of his turbid world filled with images of the consumptive and the jaundiced woe-begone! To such unwholesome inviters to a hopeless Acheron feast the Greeks offered only perpetual derision, as they did to every taste born of a spirit crippled and cramped for the fullness of hearty humanity, because they knew that what a man loves that he will become. Another mode of describing full beauty was to say that it was perfect equipoise in form, just as justice was the due apportionment of rights. The cowardly artist obtained this equipoise by cutting away all redundant richness. He made a faultless face, but it had only the beauty of emptiness. He might say that he was inspired by the Greek spirit. That was a mistake, inasmuch as the balance of two empty scales was quite different from the equipoise of two full ones. In the perfect Greek face see how generous was the sculptor to give us every individuality in his model. False art dwindled a man's capacity of application. It made him believe that beauty was only of one type, that the desirable glory of life was to have no features that were noticeable. He wanted a nose perfectly straight, a mouth very small, eyes very large, the face a perfect oval, the feet and hands very small, the instep very high, and for a woman a swanlike neck. What nonsense! Harmony in music did not consist in the putting together of one set of notes. It depended upon balance. There was no end to the variety of celestial strains thus to be created, and there was no end to the different orders of beauty that existed in this cosmopolitan world. What a nation's taste loves most that its posterity would assuredly become. This came about not only by spiritual aspiration, but by the principle of natural selection, and without regard for the taste which could be inculcated only by robust art the thousand frivolous interests in conventional life would interfere with those marriages which were calculated to bring the nation to its highest point of perfection, and to—

That far-off divine event
To which the whole creation moves.

It must be noted that the Renaissance was inspired by the example of God's nature which the Greeks had given. The Italians recognised what it was in which the living dead were still masters, and, while bending themselves to the ground when reverence was due, they never became servile imitators. They knew that art must be a living breath of their own generation. The most imminent danger of art in the present moment was of opposite character. It was from what was called the realist school. We were told to recognise that to register facts was the highest ambition. Were the new principle a true one we should be wise in applying it to letters and saying that simple definition was art in the highest sense, whereupon the auctioneer's catalogue would become the highest form of literature. For his part he had a prejudice for the older light. If beauty and grace as angelic ministers were not sought for, the painter and sculptor might be sure that they would leave him to his duller spiritual friends, and if we let the brute in us have the mastery he would glory in his domination.

Mr. Bunce moved a vote of thanks to Mr. Holman Hunt for his address, which was seconded by Alderman Kenrick.

Mr. Holman Hunt, in replying, said it was in Birmingham

that he obtained one of the first prizes he ever received—a prize of 60*l.* for *The Strayed Sheep*, exhibited at the gallery of the Royal Society of Artists. Following upon a similar recognition at Liverpool, that mark of appreciation did much to cause people to consider the purposes of the pre-Raphaelite brotherhood for themselves, and so to swell its ranks.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE eighth ordinary meeting of the Institute of Architects was held on Monday evening, Mr. J. Macvicar Anderson president, in the chair.

The decease was announced of two members—Mr. William Allen Boulnois and Mr. John Myrie Cory, of Shanghai.

Terra-Cotta.

Papers on this subject, in connection with the Art Standing Committee, were read by Mr. E. Ingress Bell, Mr. S. H. Leach (of Doulton & Co.) and Mr. Leonard Stokes.

Mr. E. INGRESS BELL, who read the first paper, said he would advocate the use of terra-cotta on general and broad grounds. Terra-cotta was a new material placed in their hands, the careful and intelligent use of which would lead to good results in design. Architects in all ages had addressed themselves to the solution of architectural problems in brick, stone and marble, and so successfully that the results could not be surpassed. Architects working in those materials could not hope to strike out anything new. The treatment must be similar, and the best work too often repeated failed in its effect. In what direction could relief be sought from the tyranny of precedent? Elementary forms could hardly be expected to be capable of alterations. General principles would always hold in regard of lintels, arches, roofs, &c. Any relief to be got must be confined to details. By attention to detail alone would they be able to differentiate historic styles and give expression in architectural style. Did the peculiar qualities of terra-cotta open out new possibilities? He hoped so. An objection urged in disparagement of terra-cotta was that it was a cast material. Hitherto, to speak of any material as cast, was to condemn it. But cast-iron was now coming into fashion again. Why not also terra-cotta? There was no evil in obtaining good results by a short cut. Moreover, the use of terra-cotta was not limited to cast work. The clay could be run or moulded directly by the artist, or the methods might be combined. An artistic hand could easily and swiftly embellish forms supplied to him. Another objection urged against terra-cotta was that the clay shrinks in the kiln. That objection was not, he thought, a serious one. It would be foolish to try and catch the beautiful effects of Greek work in terra-cotta, but there were other forms that were adapted to the material. Lines without being rigid or formal would produce a sketchy and effective appearance. A more formidable charge was that terra-cotta did not weather, but the charge was not wholly true. Much depended on the texture, but it was slow in assuming tone and parti-coloured appearance. The atmosphere of our towns finished off our buildings in black and white, without regard to the proper effects of light and shade. Hence it was a practical question to ask if buildings should be covered with materials that got daubed over thus in black and white, or if they possessed in terra-cotta a material not so affected it should be used? As he had already said, there must be careful and intelligent use of terra-cotta. The designer must have cultivated taste to design what would be worth having. The mind must be divested of the habit of thinking in stone. The two materials demanded an entirely different treatment. It must be realised that the methods of treating stone were inapplicable for terra-cotta. Stone and marble were costly, also their working and their carriage. All the conditions were changed, however, in working good-tempered clay. There was no limit as to design and detail, and in colour there was variety. The development of design in terra-cotta should be carried forward as our predecessors had done with regard to stone, and if he could not suggest that a nobler form of architecture would be arrived at, new and legitimate forms might be developed.

Mr. S. H. LEACH described the various clays, from the plastic clay of Devonshire to the firebrick clay from the coal-measures. Refractory *versus* plastic clays he described as not suitable for delicate moulding or for added ornament. The granular structure was, however, good for rapidity in drying and suitable for long mouldings. Plastic clays, though suitable for ornament, could not be made in large blocks. Colour in terra-cotta chiefly, but not entirely, depended on the amount of iron present. It was generally burnt in open kilns; that burnt in muffles was in colour more sickly. A certain Leicestershire clay had so much iron that it was red before it was burnt, but at the same time it was so charged with lime that it came out nearly white from the kiln. In some clays soluble alkaline matter was present, which by burning became insoluble, and

produced unpleasant markings. Mr. Leach described the process of manufacture, but said he failed to see the mould was the best method to use for clay except in respect of economy. Corbels, soffits and similar features in terra-cotta did not cost anything like the same in stone. The characteristic of the direct process work was plasticity, and a little practice showed how well such clay lent itself for applied ornament; the modeller enjoying far greater facilities in his work that was afforded to the wood-carver. Several methods of treatment open to the designer were alluded to, and how to avoid difficulties of distortion in the burning, mentioned. Cellular terra-cotta was next dealt with and its advantages for casing ironwork enlarged on. This it appeared could be kept in stock which could be produced plain or ornamental as required. The work could be so perfectly done that the eye could not perceive any falseness. Terra-cotta and concrete as a constructional combination was then described, and its suitability to meet practical needs as well as the purses of clients explained.

Mr. LEONARD STOKES in his paper dealt with the disadvantages of terra-cotta substantially to show that it had no constructional value, and that as applied to ornament it failed to satisfy needs, and that among other objections there were numerous instances of its shortness of life. It seemed to him superfluous to say a word against the use of terra-cotta, as they were obvious on examination. He had never used it, and he hoped nature would never cut him off from a supply of proper building materials. He deprecated bringing about his ears a nest of terra-cotta hornets, and therefore explained that his objections were *bona-fide* objections. He contended that it was a mockery to think that there were any business advantages or constructional properties to recommend terra-cotta in place of natural materials. Weight-carrying power it had none; that had to be supplied by cement concrete—in other words, not being constructional, strength must be otherwise provided in practice. Cellular blocks, a better kind of terra-cotta, were apt to burst under fire, and they, unlike good bricks, would not stand weight. Mr. Stokes described another objection to an architect using terra-cotta—the delay of the manufacturer in supplying it. It arrived perhaps at last, and was found to be underburnt, but the joy of getting it at all led to its being used instead of being rejected. Its wear was said to be everlasting. If so he was sorry for it, but that was not so, for an examination during the past fortnight of several buildings in London, ten years old at least, had shown him signs of crushing and disintegration, and one of these buildings was Messrs. Doulton's establishment at Lambeth. An architect friend of his declared he would never use terra-cotta except as a casing for iron construction. It might be useful for damp-courses, perhaps, but very ugly. He instanced a church interior having piers and arches of terra-cotta, but was sufficiently disgusted to hear that disguised iron stanchions carried the weight. He could see no artistic advantages in the use of terra-cotta. There was a chance of getting a noble and dignified effect with marble. In terra-cotta work there was an absence of reticence and a display of sensuality, the effect of which was bad. The effects of age and time had already improved the Law Courts, a colour was coming over them, but the Natural History Museum at Kensington still remained unsympathetic in appearance. If Mr. Norman Shaw, Messrs. Bodley & Garner, &c., had taken up terra-cotta, it had only been to drop it like a hot potato. Architects had always made use of materials available to hand, and would never have abandoned stone for terra-cotta. The restorer of buildings had long since set his face against cement-covered buildings, and he believed our children would rise up against earthenware and pottery buildings. As to a business question—that of cost—said to be cheap, it was dear at any price, and further, he could prove that a dignified building and a well-designed building could be put up as cheaply in Portland stone as one of terra-cotta. Also, it was a delusion as a business material by reason of delay, and consequent loss of capital and interest. He held that, theoretically as well as practically, it was an unfitted and degraded material. His advice to those about to use it was that of *Punch* to those about to marry, "Don't!" Good terra-cotta work was to be seen on the Continent where stone was scarce, but that was rather moulded brickwork. In conclusion, he might have condensed his paper, he said, into two lines, including the title, as follows:—"The Advantages of Terra-cotta." It has none.

Dr. MURRAY, of the British Museum, being invited to speak made no remarks on the subject proposed for discussion, but called attention to specimens he had brought of Greek work dating B.C. 600, found by Lord Savile at Civita Lavinia, from excavations carried out in one of his vineyards, and also specimens from the Villa Giulia, Rome. He trusted that further discoveries would put into their hands a more definite solution of this work than at present could be formed.

Sir HENRY DOULTON having been asked to speak, said he had been proud of being a potter till he came to the meeting that night. He alluded to the figure of Britannia at the Exchange, Liverpool, one hundred years old, and other two

statues in London, seventy years old, showing that terra-cotta was absolutely imperishable. When they had the fire at Lambeth the only material that withstood it was the terra-cotta.

Mr. BRYDON proposed a vote of thanks to the three gentlemen who had read the papers. He contended that no case had been made out for the use of terra-cotta where other materials were available. In public buildings they wanted the noblest materials with the noblest design and the best possible workmanship. After marble came stone as the noblest material, and stone we could always get. The fact that terra-cotta as a material could only be produced in small blocks must be taken into consideration; that tended to cramp anything like bold design. Why should architects hamper themselves with a material they had no need for? As to cost, it was better to build twice over in stone than once in terra-cotta. As far as actual cost was concerned Mr. Brydon quoted the following estimates for the Battersea Polytechnic, viz.:—Bath stone, 4s. 8d.; terra-cotta, 5s. 11½d.; Portland stone, 6s. 9d.—10s. per rod to be added for labour for terra-cotta if used, so that, labour included, even Portland stone cost only 9½d. more than terra-cotta. That, he thought, disposed of the question of cost. Further, he did not consider all the ornament proposed to be got by use of terra-cotta was wanted; it was superfluous ornament. It was bringing down architecture to furniture-designing—doing little things big instead of doing big things.

Mr. C. FOSTER HAYWARD spoke in favour of terra-cotta. He called attention to a slight restoration by Mr. Norman Shaw at Layer Marner, and said he had himself used terra-cotta in a stone district (Plymouth) along with limestone and local granite, and that it had shown no signs of deterioration.

Colonel EDIS, F.S.A., controverted all that Mr. Stokes had urged, saying he had dealt unfairly and unjustly with the subject. Without mentioning what the cost was, he said it would do him, as the architect of the Constitutional Club, great injustice to let Mr. Stokes's statement as to the cost pass unchallenged, but it was nothing like what Mr. Stokes had stated. He referred next to terra-cotta work in North Italy, notably that at the Certosa. Were architects never to employ a material that was new? Portland stone did not wear well in London—decay could be seen in the stonework of Somerset House. He was surprised to hear Bath stone mentioned for comparison. They need only see Lord Salisbury's house in Arlington Street to judge of it. Terra-cotta was not the only material in getting which delay took place. It afforded endless opportunities for artistic treatment. Though many had spent their lives in studying its capabilities, Mr. Stokes had acquired his knowledge of the material in a fortnight.

Mr. JAMES NEALE, F.S.A., seconded the vote of thanks. While admiring Mr. Stokes for his outspokenness, he expressed himself in favour of using terra-cotta provided the temptation to prettiness did not lead the designer into over-ornamentation.

Mr. ASTON WEBB argued in favour of terra-cotta because Mr. Stokes had only a fortnight's study of it, and because it was not the only material that was not self-supporting.

Mr. J. C. EDWARDS, of Ruabon, asked by Mr. Stokes to give an idea of what the estimate would be for terra-cotta for a building similar to the Constitutional Club, said quantities had not been supplied to him, and that he had left a good margin for profit.

The vote of thanks was put to the meeting by the President and carried by acclamation. It included Mr. Bell, Mr. Leach, Mr. Stokes, Sir H. Doulton, Mr. Edwards, and Messrs. Gibbs & Canning, of Tamworth, specimens of the work of these firms being exhibited on the occasion.

TESSERÆ.

The New Town, Edinburgh.

THE tameness which exists in the original conception of the plan might have been much relieved by the architecture. But, to say truth, men's minds were not at that time ripe for the splendid ideas which have been since entertained. The new town, at its commencement, had to struggle with the rivalry of George's Square, and with the prejudices of persons attached to the old city, who predicted loudly that the plan would altogether fail. The buildings, therefore, at the east end of Prince's Street were necessarily undertaken on a moderate scale of expense, and even those of St. Andrew's Square, though good houses within, present no decorations on the exterior, excepting on the east side, where an example has been set by the magnificence of Sir Lawrence Dundas, who built for his own residence the handsome hotel afterwards occupied as the Excise Office. Unquestionably, any plan which could at that time have been proposed for breaking the uniformity or adorning the monotonous simplicity of the new town, whether by introduction of more public buildings or by ornamenting the exterior of private houses, and concealing with blocking-courses

the long, mean line of sloping roofs, would have been a serious obstruction to the general success of the undertaking. Yet every eye is now sensible that George's Street, otherwise so handsome, is rendered mean by its extreme breadth, which extends betwixt two lines of low houses, whose broad, slated roofs are unbroken and undignified by projections or occasional elevations. Our criticism, indeed, applies even to circumstances connected with the original plan of the new town, for which the poverty or narrow spirit of the times in which it originated forms no sufficient answer. It unfortunately occurred to some of the parties concerned that the earth dug out of the foundation of the new houses might be employed to advantage in forming a communication with the old town, by the creation of that mound of earth which is now extended across the valley. For this purpose the proprietors and builders of houses were bound, in their contracts with the city, to excavate their front areas to a certain depth, in order that each might contribute a share of earth to a great end, as it was then thought, most useful undertaking. This was the origin of that huge deformity which extended its lumpish length betwixt Bank Street and Hanover Square, the most hopeless and irremediable error which has been committed in the course of the improvements of Edinburgh, and which, when the view which it interrupted was contrasted with that which it presented, was, and must be, a subject of constant regret and provocation. Had the areas formed in the new town been no more than half their present depth, the following consequences would have necessarily arisen:—1. The fears, relieved of a very considerable expense, would have been able to pay a larger ground-rent. 2. The houses, being higher by the half-storey which is now buried below ground, would have acquired more dignity and importance. 3. The surplus saved would have been more than sufficient to build a handsome arched bridge where the earthen hulk extends itself, furnishing all the convenience now derived from that mass of deformity, and substituting instead an object of high architectural beauty. The new town of Edinburgh, as originally planned, contrary to every prediction which had been uttered on the subject, was built and occupied within forty years after it had been commenced.

Turner as an Illustrator.

Turner's skill and reputation recommended him both to printsellers and publishers, but none of the larger engravings from his works were very successful speculations, though the gravers of the two Cookes, of Miller, Goodall, Prior, Pye, Wallis and Willmore were employed to translate them into black and white. He was careful, too, in touching upon the proofs, and added many master strokes of effect in this way, so that no pains were spared to give them every recommendation; and yet with all this they did little more than cover their expenses. The "Tivoli" and "Temple of Jupiter" should have made money. His book-plates, such as his views on the southern coast, his three annual tours on the Seine and Loire, and in Scotland at an earlier period, for the "Provincial Antiquities," were more successful. He was happy, too, in the numerous illustrations which he made for the monthly issue by Cadell of Scott's poetry and miscellaneous prose works in forty volumes. His drawings for Murray's seventeen-volume edition of Byron are occasionally in his best manner. Still better are his illustrations for the "Italy" and other poems of Rogers. He was not so good in what he did for Campbell's poems, or for Moore's "Epicurean"; and when he ventured to furnish seven illustrations to Sir Egerton Brydges's edition of Milton, he was hardly equal to the task. His seven subjects were, however, well chosen:—"The Mustering of the Rebel Angels," "The Fall of the Rebel Angels," "The Expulsion from Paradise," "The Temptation on the Mount," "The Temptation on the Pinnacle," "Ludlow Castle and the Rising of the Water Nymphs," "St. Michael's Mount and the Shipwreck of Lycidas." The drawings, of the same size as the engravings, are exquisite pieces of colour and effect. "The Shipwreck" (a favourite subject with him) is the happiest of the seven. For his drawings for books he received prices varying from twenty to twenty-five guineas. Some he lent, those executed for Rogers and Campbell, for instance, and got good prices for the right of engraving them; others, that were sold outright, passed from the publishers into the hands of collectors. Mr. Windus obtained the sixty-four illustrations of Scott at twelve guineas a drawing. Mr. Munro bought the illustrations for Milton, the publisher of the Milton (Mr. Macrone) getting his money back, it is understood, by the sale of the drawings. It was indeed a more than safe speculation to employ him in the illustration of books. His twenty drawings for Whitaker's "Richmondshire," for which he received twenty guineas a drawing, were sold by the publishers, some at a little below cost price, and have since brought sums varying from eighty to one hundred guineas each. His travelling expenses, when he worked for publishers, were paid for separately, and it is right to add, what Cadell has been heard to declare, that he was moderate in his charges. His habits of saving were not confined to his own pockets.

An Estimate by Wren.

The following "Estimate of finishing part of Hampton Court" was sent by Sir Christopher Wren to William III.:—"To the King's most excellent M^{tie},—May it please y^r M^{tie}, your M^{tie} having been graciously pleased to signify y^r Comandes to me, that I should give an Estimate of the expence of fitting the Inside of the Roomes of State at Hampton Court, from the entrance out of the Portico to the roomes already finished above staires, containing the Great staires, the Guard Chamber, the Presence Chamber, Privy Chamber, Drawingroom, Anteroome, Great bed chamber, Lobby and Gallery for the pictures; in pursuance of this comand I humbly represent—That although a perfect estimate of Finishing the Inside of any house is as uncertain as the charge of Furnishing, & is more or lesse according to the intention of the Owner: yet, upon supposition that your M^{tie} would finish as decently as the greatness of the Roomes seemes to require, and having consulted y^r M^{ties} Officers of the Workes what is requisit to be don & the charge of each Roome, I have represented the Worke of each Roome & the totall Expence as followeth:—1. The Great Staires to be made with Steps of the Irish Stone, such as are at Kensington, but longer & easier, with Iron Rayles of good worke; the Floor and Harthplaces to be well paved with Marble; the Walls to be wanscoted 20 foot high, with five Dorecases. 2. The Guard-chamber to [be] fitted for Armes as at Windsor, and other Houses. 3. The Presence-chamber to be fitted for Hangings, with Marbles in the Chimny and the Stooles of the Windowes, and proper Ornaments. 4. The Privy-chamber in like manner. 5. The Drawing-room with some variety, as having the best Furniture. 6. The Anteroome well finished. 7. The Great bed chamber to be perfected. 8. The Gallery to be fitted for the Cartoons with Wanscote on the Windowe side and below the Pictures, & between them, and with wanscote behind them to preserve them from the walls, & with a Marble Chimny & Marble Soyles in the Windowes, and other things proper to complete the same. 9. The Lobby between the presence and Gallery to be ceiled & finished. 10. The boordes of all these Roomes (being already provided very good & drie) are to be laid after the best manner, without Nayles & with battens under the Joyntes. The Expence of this Worke, thus performed by good Artists will amount to the Summe of 6,800*li*. All the Insides of these Roomes have been long since designed, and shall be presented to your M^{tie} for your approbation & correction, & accordingly the expence may prove more or lesse; but I am humbly of opinion the worke may be decently performed to your M^{ties} satisfaction for the Summe above mentioned. It may be farther considered, that other things will be required for the accomodation of those who are to be near your Royall person, and that the Courtes must be paved, more Sewers made, and the Water brought to more places; and other things necessary for your M^{ties} service; which may be estimated as they are directed: All w^{ch} is most humbly submitted.—April 28, 1699. CHR. WREN."

Mediaeval Sculpture.

It is most curious to observe how profoundly, and yet how lucidly, works of art reflect the ideas of the epoch in which they were executed. When society was governed by the clergy, that is, from the fifth to the ninth century, the art is found grave and austere; faces, whether in sculpture or painting, are imprinted with one universal character, and never are they seen to relax into a smile. From the ninth to the thirteenth century, during the period of feudal sway, the attitudes become stiff; something arrogant is remarked in the general bearing, something of audacious daring in the expression; the features throughout bear the impress of courage, but mingled with harshness and severity. Subsequently, from the thirteenth century down to the fifteenth, when the bourgeoisie had taken root and propagated themselves in the emancipated communes, the art bent before their influence. The stiffness that had prevailed in the preceding epoch was succeeded by varied action; the savage character degenerated into the familiar, and nobleness of features into vulgarity. The ideal was lost in the real. Yet the type of man at this period was furnished by the "bourgeois" of the middle classes, striving to imitate the noble, whose rank they aspired to gain, and consequently still wearing some semblance of elevation of mind, and displaying an eager desire for distinction. But between the fifteenth and sixteenth centuries, a nameless crowd, a populace in rags, with garments torn, and marks of poverty in figure and in habiliments, their physiognomy and outward expression invariably common, and too often rude and barbarous in soul, broke loose upon the political and artistic world. The irruption of this vulgar crowd troubled the course of æsthetics, and its dull, heavy countenance intrudes on the most elevated ideal conceptions. It is possible, by close study, to discover in the sculptures of cathedrals, in painted glass windows, and the miniatures of illuminated manuscripts, variations of feeling indicating a difference of period: a material difference—an individuality—may even be discovered in edifices of the same era, but erected in different

countries. Thus, in the cathedral of Paris, as has been often remarked, confessors rank higher than martyrs, that is to say, intellect is more highly venerated than faith. At Chartres, on the contrary, faith takes precedence of intelligence, martyrs of confessors. In the church of Notre Dame de Brou, founded by a woman, the primal virtue is charity. During the Renaissance, when men were Pagan rather than Christian in sentiment, not one only of the theological virtues was neglected, but all three at once, and the four cardinal virtues were substituted in their place—prudence, justice, temperance and strength—moral virtues exalted in pagan times far above all others. In short, the personified virtues represented on Christian monuments testify by their nature, their number, and the rank they occupy; the social condition of the period and country in which they were produced.

Influence of Greece on Indian Art.

The architecture of India begins (as unequivocally stated in 1855 by Mr. Fergusson) with a strong admixture of Greek art, the effects of which we are able to trace for centuries in the architecture of the valleys of Cashmere and Cabul. The classical character of the extensive collection of the Buddhistic sculptures from the neighbourhood of Peshawur, which have been exhibited by Dr. Leitner at the India Museum, is unquestionable, and incontestably proves the direct influence of Greek art on the architecture of India throughout the whole period of the culmination of Buddhism in India. In the Cashmere temples, which were all built between the fall of Buddhism and the rise of Mohammedanism, the Greek influence was still very marked. "Nowhere in Cashmere," says Mr. Fergusson, "do we find any trace of the bracket-capital of the Hindus, while the Doric or quasi-Doric column is found everywhere throughout the valley in temples dating from the eighth to the twelfth century A.D." Indirectly also, Greek art has probably influenced the architectural and other arts of India through the Sasanian art of Persia. From the Mohammedan conquest of India the further development of Buddhist art is to be traced chiefly beyond India in Tibet, Burma and China, in which countries Buddhism has prevailed without any interruption for more than 2,000 years, among races of mankind closely allied to the Turanian population of the Gangetic valley, who first evolved the religion of Buddha, and spread it with its characteristic architecture over south-eastern and eastern Asia. It would be interesting to trace the influence of the introduction of Buddhism into America in the fourth or fifth century A.D. on the architecture of Mexico.

Heralds' Visitations.

It was at one time the custom for the heralds to make visitations, as they were called, amongst the various nobles and landed proprietors, for the purpose of inquiring into and setting right all irregularities connected with armorial bearings, and for compiling the necessary records. Of so much importance were these visitations held at the time, that they took place by virtue of a commission under the privy seal, to the two provincial kings of arms, authorising and commanding each of them, either personally or by deputy, to visit the whole of his province as often as he should think fit, to convene before him all manner of persons who pretended to the use of arms, or were styled esquires and gentlemen, and to cause those thus summoned to show by what authority they claimed the distinction. Great and almost unreasonable powers were granted to them for the carrying out of these objects. They had license not only to enter, upon reasonable request and at reasonable hours of the day, into all churches, castles, houses and other places, to peruse therein all arms, cognizances, crests, and other devices, and to record the same, with the descents, marriages and issue in register books—which are now so well known as the visitations—but also to correct and reform all bearings unlawfully usurped or inaccurately adopted, and in certain cases to reverse, pull down, and deface the same. The mode of procedure was this. On arriving at the place wherein the visitation was to be holden, the provincial king issued a warrant, directed to the high constable of the hundred, or to the mayor or chief officer of the district, commanding him to warn the several knights, esquires, and gentlemen particularly named in such warrant, as well as others within his jurisdiction, to appear personally before him, at the house and on the day specified, and to bring with them such arms and crests as they then bore, together with their pedigrees and descents, and such evidences and ancient writings as might justify the same, in order to their being registered. On the day appointed, the provincial king or his deputy attended, and so long as the laws of chivalry were honoured and esteemed, general attention and respect were paid to these summonses; attested pedigrees were submitted to the heralds, and thus were produced the important registrations which have preserved to the present period many a line of descent that would otherwise have been irretrievably lost.

NOTES AND COMMENTS.

THE judge of the Swansea County Court, Mr. GWILYM WILLIAMS, on Friday last was emphatic in condemning the defence that was set up in an action that was brought for the recovery of architect's fees. The plaintiff, Mr. EDWARD BATH, of Swansea, was asked to prepare plans for a hotel, with specification and quantities. He submitted them to the licensing justices, by whom they were approved. Some good-natured friend afterwards suggested that the specification was not what it ought to be, and the client in consequence tried to get out of her undertaking. Mr. BATH thereupon brought an action to recover 98% for his services. The defendant counterclaimed 100% loss incurred through plaintiff's negligence. Judgment was given for Mr. BATH. As regarded the defendant's claim, the judge said it was based on an allegation of fraud. He would not use the term "disgraceful," but it was certainly very bad taste to suggest fraud. He did not find that there was any fraud, and not for one moment that the tender was a bogus one. The items alleged to be bogus were items usually inserted, which could not affect the building and the mortgagees' security. He would go further, and say it did not matter to the issue whether they were bogus or not, for, from her letter, the defendant was the responsible person, and how could she accuse a man of going for a "bogus" tender and the counterclaim upon them? Judgment was accordingly also given for Mr. BATH on the counterclaim, with costs of witnesses that were called to rebut the allegations made.

PUBLIC bodies in Scotland appear to imagine that plans for buildings are as easily prepared as exercises in schools. The Brechin Police Commissioners are eager to have municipal buildings, and accordingly they offer 25% for the set of plans that is adjudged best, and another of 5% for the next best. The advertisement further announces that the best plans "will become the property of the Police Commissioners, who will be entitled to use them as they see fit." The attention of the Dundee Institute of Architecture, Science and Art has been called to the project, and it was decided to forward to the Commissioners a copy of the Institute's conditions, with the suggestion that they should conform therewith. But as long as the Commissioners are aware that there will be no lack of plans submitted to them, we fear they will not care much about the appeal of any society. If the Dundee Institute could persuade northern architects to refrain from competing for a five-pound prize there would be fewer projects of the Brechin class.

It may not be generally known that KARL GRUNOW, who was respected during many years as director of the Technical Art Museum in Berlin (he died on February 16), was originally an architect. He co-operated with GROPIUS in building the museum to which he afterwards was attached. His duties as director engrossed so much of his time he was unable to practise his art. But he occasionally was able to render service by his advice when memorials of many kinds were being produced. It is well known that the precious silver table which the city of Berlin offered to the present Emperor on his marriage, and the great bronze tablet which the Prussians gave to Field-Marshal MOLTKE on his ninetyeth birthday, owed much of their character to the inspiration of GRUNOW. The director was also an inventive mechanic.

ABOUT three years since Madame SCHLIEMANN made a promise that the excavations which her husband had commenced at Hissarlik shortly before his death were to be resumed. There were several obstacles to be overcome before her desire to carry out the trust could be realised. There need be no longer any delay. Dr. DÖRPFELD, who was long associated with the late Dr. SCHLIEMANN, and whose competence as an archæologist imparted additional interest to the later excavations, has undertaken to complete the exploration which his friend commenced. He will start from Athens, where he has charge of the German Institute, on April 11. Dr. DÖRPFELD will be accompanied by several of his countrymen who are studying in Greece,

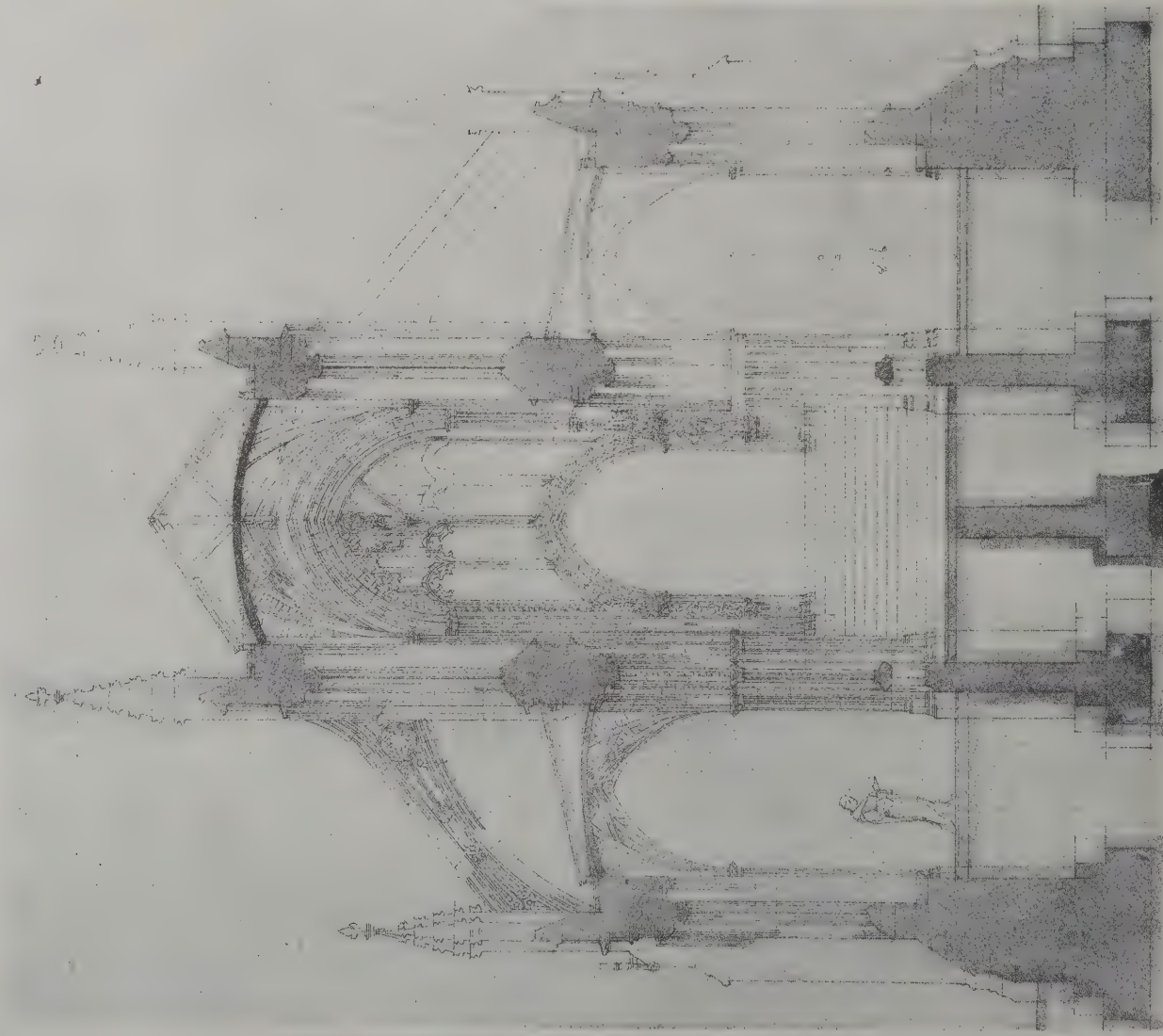
They will be glad to render assistance in so interesting an undertaking. It is anticipated that besides these experts there will be several visitors from Germany. Let us hope England will not be without representatives. We need hardly say that those who are not present at the opening of the excavations are likely to miss that part which is the most interesting of the spectacle. The remains may become friable soon after their exposure, but the vision of them must be invaluable; and if they are skilled there can hardly be too many observers present to record the phenomena.

EVERY year there is a commemoration of celebrities in Paris by calling streets after them. In the latest proposals artists are not forgotten, HITTORFF, PIERRE BULLANT, the architects; LANÇON and RIBOT, the painters; CHAPU, the sculptor; DECK, the ceramist; and ALPHAND, the late director of municipal works, are among the favourites in the Municipal Council. The name of JEAN LECLAIRE, the house-painter, is also to be inscribed on an enamelled plate, but it is not, however, on account of his merit as a decorator, but as a recognition of his experiment in sharing the profits with the workmen. Although he introduced co-operation more than half a century ago, LECLAIRE has obtained scant attention from the official awarders of fame, and the statue of the pioneer of co-operation is not among the notabilities that appear on the exterior of the Hôtel de Ville.

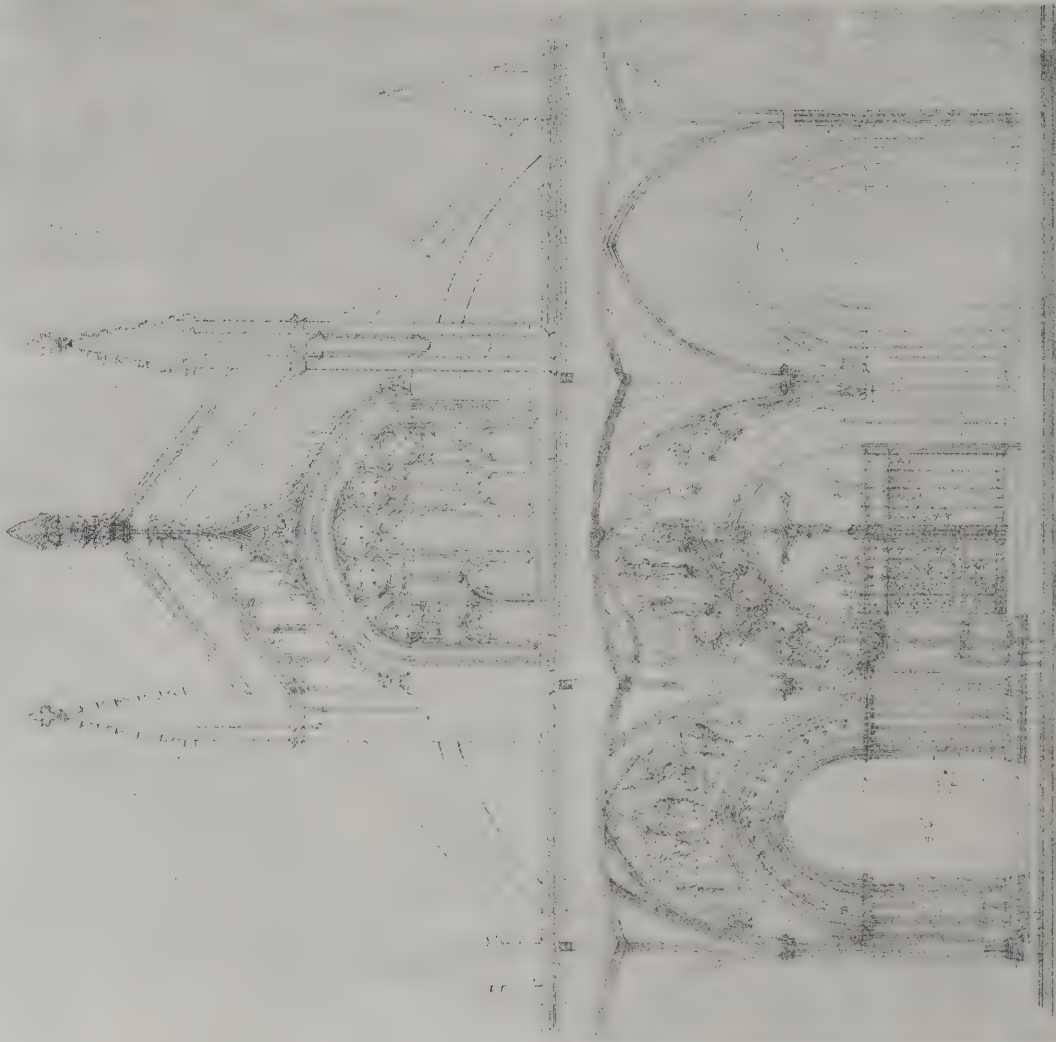
ONE of the minor questions with which the French Government is expected to deal is the admission of lady students to the Ecole des Beaux-Arts. The opinions of some painters on the subject has been solicited. M. BONNAT does not deny the right of women to take up painting and sculpture, but he doubts their possession of either the physical force or the intellectual power which would be necessary for success. Nobody can imagine a female MICHEL ANGELO, TITIAN, RUBENS, REMBRANDT or RIBERA. M. BONNAT believes that women were not sent into the world to paint and model; they have something better to do, and their true rôle is so noble and elevated they need not envy the artists. M. CHARTRAIN holds that on no account ought womankind be admitted either to the courses of lectures or to the ateliers. M. CAROLUS DURAN, on the other hand, recognises the right of women to follow the same studies as men, but he would have special ateliers for them. M. HENNER, in a characteristically quiet way, professes his ignorance about the courses which the ladies are eager to follow, but he considers that already there are far too many for men in the Ecole. His neighbour, M. PUVIS DE CHAVANNES, declines to express an opinion. M. JEAN BERAND expresses the most modern idea when he says that men as well as women should be kept out of the Ecole des Beaux-Arts, which he maintains is an institution that is absolutely useless if not dangerous. Under the circumstances the Government will be excused for adopting the prudent *laissez-faire* policy.

IN the competition for the Mills Grammar School for Girls, Framlingham, sixteen sets of designs were submitted. The plans selected are by Mr. FRANK BROWN, architect, of Ipswich. The designs of Messrs. GEORGE J. & F. W. SKIPPER, architects, of Norwich, were awarded the second place, but the premium was declined, the architects preferring to have their drawings returned to them.

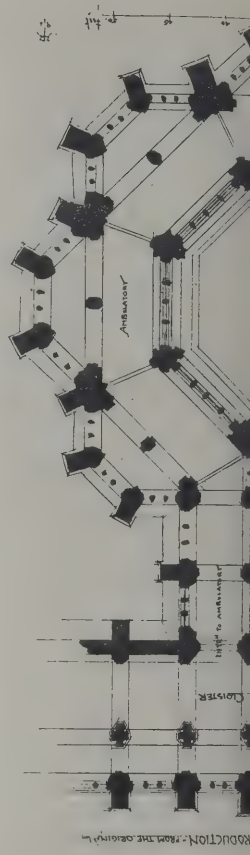
THE *Art Journal* was so successful in publishing the Vernon Gallery and other paintings that were presented to the nation, the conductors may be considered to have a prescriptive right to be accepted as entitled to reproduce the Tate Gallery. The first etching appears in this month's number, the subject being the *Vale of Rest*. It is not the work that is best suited to start with, but it appears to be No. 1 in the catalogue. Mr. G. O. MURRAY has done his best to impart interest to unsatisfactory materials, but with so morbid a subject, who could succeed? The number does not depend for attractiveness on one plate. There are numerous illustrations, and readable articles by Mr. DAY, Mr. MACCOLL, Mr. ARMSTRONG and Mr. E. BROWNE.



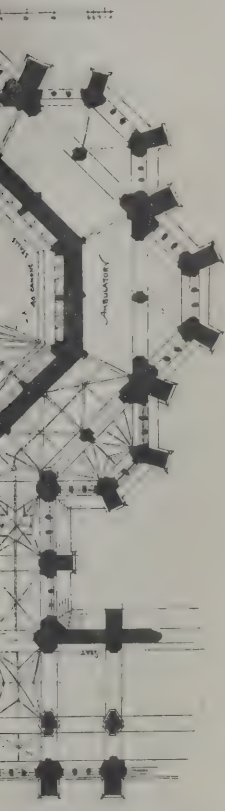
Cross Section High Entrance.



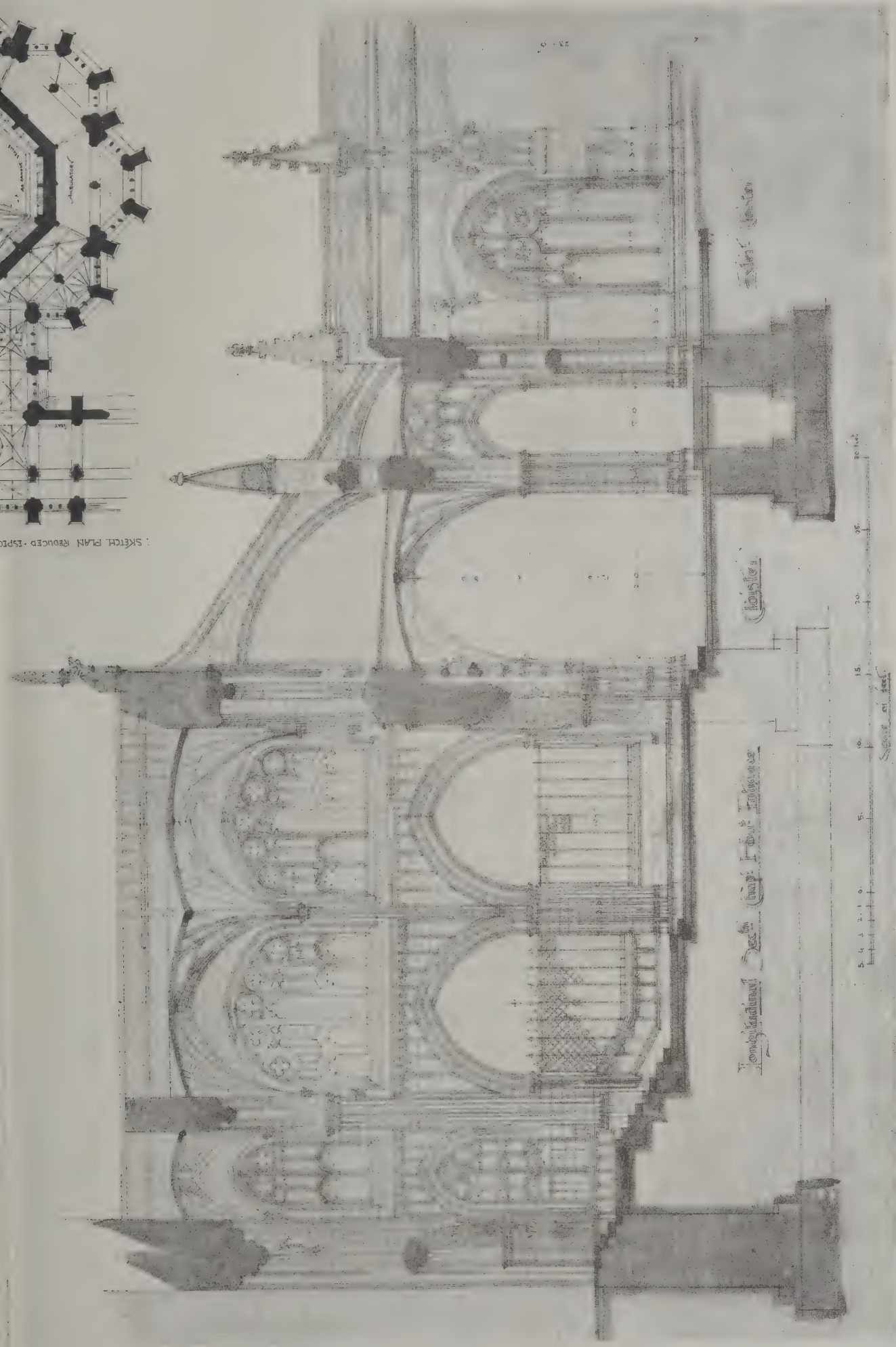
Entrances from Cloister.



PRODUCTION - FROM THE ORIGINAL



SKETCH PLAN REDUCED - E.P.P.



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DESIGN FOR A CHAPTER-HOUSE.

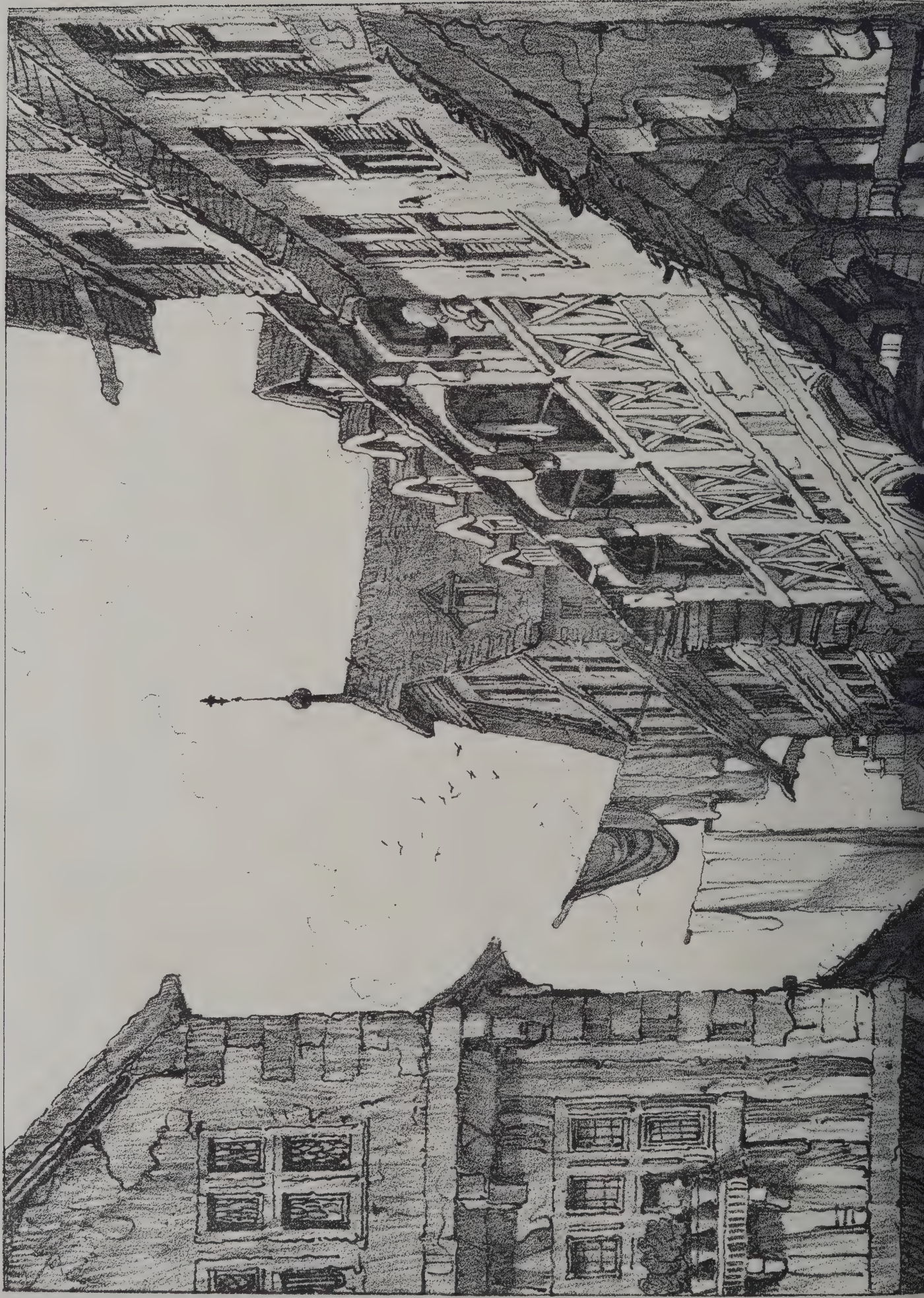
(Soane Medallion Awarded 1892.)

By HEBER RIMMER.





The Architekt, March 3rd 1893.





Sachsenhausen
FRANKFORT

SACHSENHAUSEN, FRANKFORT.

Drawn by SAMUEL PROUT.

ILLUSTRATIONS.

HALTON, HERTS.

ASCOT WOOD HOUSE.

DESIGN FOR ENTRANCE TO A CHAPTER-HOUSE.

IN the instructions for the Soane Medallion Competition, 1892, subject "Design for a Chapter-house," the entrance was expressly mentioned for illustration and design, together with the cloisters. The sheet here given was entirely devoted to this subject.

An ambulatory was carried round the main fabric, connected with, and on the same level as, the cloisters, the chapter-house itself being raised about 8 feet above these walks, thus necessitating the staircase illustrated.

The plan, which has been added for the purpose of this illustration, is drawn to show more clearly than in the original one the simple lines on which it is set out: Two squares placed diagonally over each other, the projecting angles forming a distinct bay in the ambulatory to every face of the octagonal chapter-house. The style throughout was late fifteenth century. The design is by Mr. HEBER RIMMER, of Chester, to whom the Soane Medallion was awarded.

SACHSENHAUSEN, FRANKFORT.

[By an oversight Mr. COLLUTT's name was given as that of the architect of the premises in Mount Street, published last week, instead of Mr. A. J. BOLTON's.]

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Association was held on Friday evening, Mr. H. O. Cresswell, president, in the chair. Mr. G. Tolley and Mr. J. A. Smith were elected members. Mr. ARTHUR STREET, M.A., read the following paper, entitled—

Originality and Individuality in Art.

In making a few observations to-night on the subject of Originality in Art, I shall begin by offering the smallest possible contribution to the literature of the much-vexed and well-worn question whether or not a new architectural style is possible. The question seems to me a perfectly futile one, but there have been not a few in the past who have been unwilling that the nineteenth century should pass away without having affixed its signature definitely to some new development, or even to some new birth, always to be associated with its name thenceforward. Such an aspiration tells for me a sad story of self-importance, and is indeed no bad symbol of an age which has created advertisement as a fine art. A style started under such auspices, properly perfected in all its parts, and duly patented, should, in the eternal fitness of things, become the stock in trade of a limited liability company, pass through a fitful and fevered span of existence, secure, who knows, a quotation on the Stock Exchange, and be buried at last with becoming obsequies by an official receiver. Let the style grow if it will, but let the aspiration take care of itself. I can conceive of no Zeus among architects from whose teeming and fertile brain such another Pallas Athene should spring, fully grown and completely equipped. When, indeed, may we ask, in the whole history of the world has there been originality in the sense of absolutely new invention? Modification and evolution have been the watchwords all through. Those who cry out for an original style ask, as I understand them, for a tabula rasa on which to inscribe hieroglyphics never before seen, or combinations of forms without precedent. They ask for an artistic cataclysm, for a labouring of the mountains and a new and strange birth, but history will tell them that the most fundamental changes have been happened on rather than discovered, that forms have existed as results before they were recognised as the embodiment of new principles and the starting-point for fresh enterprise. All growth must be gradual; the new must germinate in the decay of the old: there is no solution of continuity in the process, no moment at which you can say that the change in degree has become one in kind, or you might argue that one moulding makes a style, as the sophists of old that one grain makes a heap. Further than this, all experience tells us that in the sphere of Art, unlike that of Science, the limit of perfectibility is reached while the study is still, comparatively speaking, in its youth. "Those arts," it has been said, "which depend on individual genius and incommunicable power have always leapt at once from infancy to manhood, from the first dawn of rude invention to their meridian height and dazzling lustre, and have in general declined after. This is the peculiar distinction and privilege of each, of Science and Art; of the one never to attain its utmost limit of perfection, and of the

other to arrive at it almost at once. In after ages great men have arisen, one by one, as it were, by throes and at intervals, but, in the earlier stages of the arts, they rose by clusters and in constellations."* But I am flogging a dead horse, and am content to believe that the day for such crude imaginings has gone never to return, and that every one of us here realises that the mere entertainment of such an ambition stamps a man as singularly ill-fitted to make the experiment. For my own part, I wish we could sink styles in style, and cultivate pure beauty of form and constructive propriety without troubling ourselves in any given instance what our sources of inspiration may be, or whether or not—if we care to run them to earth—they are all referable to one date of work. It is not every one who can practise so bold an eclecticism, if I may use such an expression of an artist whose work can never have been consciously derivative, as Mr. John Sedding: to attempt to conjure with edge-tools, as he did, is for the prentice-hand to court death by the happy despatch; but when once we have gone thoroughly and systematically through the educational mill, when the mind has been impressed for good and all with the varied outcome of centuries of artistic energy, all of which the man of broad sympathies, who can feel the common principles underlying the different forms, may well enjoy; when the artistic sense has been cultivated and the proper appreciation of beauty has become an instinct, then it is time to throw off the leading-strings which, when they have ceased to guide, have begun to hamper us, and step boldly out into the field of practical architecture to do or to die.

One sees the pedantic attitude of mind to which I demur—the cultivation of the letter rather than the spirit—in the small body of amateurs who make the study of architecture their relaxation, and one sees it there perhaps at its worst. The building is too often a vile body on which to test a knowledge of styles and dates rather than the thing of beauty, and more importance is attached to the docketing and pigeon-holing of details than to getting a large and comprehensive grasp of the whole. It will be understood that I am only speaking suggestively; but I have no doubt whatever that it is too often forgotten that the building which is a masterpiece should be approached in the same way as the book which is a classic. Dr. Johnson has told us with convincing wisdom that the beauty and unity of a great conception should not be broken, or its thread interrupted, by a reference to the notes on a first reading:—"Notes are often necessary," he says, "but they are necessary evils. Let him that is yet unacquainted with the powers of Shakespeare, who desires to feel the highest pleasure that the drama can give, read every play from the first scene to the last with utter negligence of all his commentators. When his fancy is once on the wing, let it not stoop to correction or explanation . . . and when the pleasures of novelty have ceased, let him attempt exactness and read the commentators." I suppose the commentator in our case is, strictly speaking, the verger, whose mission it is to turn poetry into prose; but his mistake is shared by many in an unofficial way. I have been speaking of the mote in my brother's eye, but it does not follow that we have not a beam in our own; as a matter of fact, if not such sinners in our own persons, we must be held ultimately responsible for the shortcomings of others.

Let us hear what the oft-quoted Montaigne has to say on the subject:—"When I hear our architects," he says, "mouth out those big and rattling words of Pilasters, Architraves, Cornices, Frontispieces, Corinthian and Doric works and such-like fustian terms of theirs, I cannot let my wandering imagination from a sordaine apprehension of Apollidionius his pallace, and I find by effect that they are the seely and decayed pieces of my kitchen-dooere."

Montaigne was common sense personified, and gifted with that sort of perspicacity which makes his criticism valid for all time, and it is good for us to know how the hyper-professional attitude struck him, that seeming desire—if it is not a real one—to create a shibboleth, to make something of a trade secret of what is intelligible to any cultivated taste. But to look at the same failing in another aspect, I do not know what may be the experience of others, but I have frequently been confronted in the intelligent world of art with a feeling of resentment, not more at the rigid adherence of a modern building to an old model, when there was no special suitability to suggest it, than at its being deliberately labelled with the name and title of the type to which it conforms. For an architect to bind himself hand and foot to the rigid exercise of one style, no matter how varied the requirements he has to fulfil, if it is to cultivate dexterity at the sacrifice of the taste, judgment and discrimination which a more liberal appreciativeness or a less cautious attitude will keep in constant activity, is at least a course which has its merits and claims our respect, but for the same man to say, Now I am going to design in the Perpendicular style, now in the Jacobean, now in that of Henri Quatre; to work professedly under several recognised sets of conditions, adhering blindly to precedent in each, and

* W. Hazlitt.

following the model with academic scrupulousness—in a word to be on terms of distant acquaintance with all, and familiar with none—does, indeed, seem the way to quench the spirit and leave nothing but the dry bones for our delectation. “Warnut I says, and I ups and give it a twiddle this way;” it is nothing but the attitude of the shoddy wood-grainer writ large.

I take it that no self-respecting man is consciously satisfied with the paste and scissors method of design, however nearly he may approach it in actual practice. Even those who are least generously endowed by nature, or most conscious of their own deficiencies, feel that they have something within themselves which it would be a satisfaction to them to put into their work. Originality is a wide and vague term, but, at least, it conveys to most of us an idea sufficiently definite to admit of our aiming at it, and that it should be invariably made our object I do not doubt.

There seems to me absolutely nothing of real interest in a work which is simply free from solecisms and mistakes, in which all the virtues are negative, which is devoid of character and life in much the same way as the typical head which is produced by photographing one over another—where every feature is the mean between a variety of extremes. It is better to have fought and lost than never to have fought at all; it is better, vulgarly speaking, to have come an artistic cropper on one's own account, than to have skated about all one's life on the architectural ice leaning on the chair of convention.

I believe, then, that an independent and self-reliant attitude should be a condition precedent to all design, but I deprecate the encouragement of purely visionary aspirations for novelty. Only the other day I read in what should have been a sober publication, as it was an official one, a warm recommendation by one Frenchman of the following rhapsody by another—M. Vitet. “Never,” says the latter, “never in the world has an art been produced twice in the same guise; or, if it has, it was a mere trade the second time, and not an art. Honour to those who, even in our day, do not despair of inventing a new architecture. . . . Let them draw their inspiration, neither from the forms of antiquity, nor yet from those of the Middle Ages, but let them be impregnated with the sentiment of a master-thought—the thought of an artist, not an archæologist.”

There is a great fallacy in this aspiration to start with, and one which has been exposed before now, and that is the assumption that the intellects of a new cycle must always approach a problem from a new point of view. The real truth is that the same class of mind in any age will always approach a problem in the same way and arrive at kindred results. Signal novelties in thought,* we are told, are as limited as signal inventions in architectural construction, and *vice versa*. The Rousseau of the Social Contract and Emilius was, to take one example, in close touch with the Spartan Lyncurgus, or with the society which that name represents; his nature led him to approach a problem which he believed to be identical in a way which was identical actually. Classification, in a word, should not be made according to dates, but according to the nature of the thinkers, for that there should be a recurrence of ideas in similarly constituted thinking machines is at once natural and the fact. Again, to tell one to lay violent hands on a master-thought, unless it is someone else's, is about as reasonable as to tell one to inherit 10,000*l.* a year, or to suggest that one should become Archbishop of Canterbury; master-thoughts are not so easily come by, and still less if the master-thoughts of past generations are to be a dead letter to us; we must all too have been archæologists in our degree or we shall find when we sit down to the desk that the teeming visions of an exalted fancy are all too ethereal for the sober process of transmission to drawing paper.

In saying that the meaning of originality is generally understood, I am not blind to the various glosses which ignorance or self-conceit put upon it, nor in suggesting it as an aim do I mean that the young designer is to set it up consciously as a thing to be won. Originality is a subtle quality, a fresh and natural sense of fitness, which bears no forcing; which to strain after is to put beyond reach. It cannot exist in the design unless it has existed first in the designer, because it is in its real nature an unconscious expression of the artist's own personality; a form of self-realisation—his way of viewing a thing, his way of seeing the possibilities and meeting the necessities of a given case, and no one else's. Nature breaks the mould, as has often been said, when she forms the man: individuals may approach or touch each other at points, but never all along the line. Each is an original piece of work himself, and his natural product cannot be less so; unfortunately for us it is very easy to go the wrong way to work; and to dam up the flow of our natural tendencies, or to carry them into an artificial channel is the simplest thing in the world. This conscious craving to do something fresh, as formulated by M. Vitet, is almost fatal in itself, and the very air we breathe nowadays teaches us to be self-conscious and introspective: for better or worse, and mainly for worse, we have eaten of

the tree of knowledge of good and evil, and the charms of innocence and simplicity are not naturally inherent in anything we produce. Stendhal's autobiography or Marie Bashkirtscheff's diary are only extreme instances of a common complaint, and nothing opens the eyes more thoroughly to the difference between the conditions which govern our work and those under which the masterpieces of our great predecessors were produced than the comparison of such morbid outpourings as these with the breezy simplicity of Cellini's life of himself.

If any proof were wanted of the need of an intimate converseance with old work it would be found, I think, in the aid which it gives to facility in production, so that it is half unconscious; the tools, at least, are all to the craftsman's hand, and the thread of inspiration is not broken by petty interruptions. I do not like to think of limiting the scope of study in any way, but at the same time it seems clear that a man has been both better endowed by nature, and will be actually better equipped, whose preferences lead him to put definite bounds to the sphere of anything like exhaustive inquiry. In this connection I make no apology for quoting from an essay by Mr. John Morley on “Literature,” because literature is one of the fine arts, and the same critical faculty, if not the same productive, is concerned whether architecture or English prose are in question. Mr. Morley has been speaking of the lists of the best one hundred books with which we were flooded a few years ago, and he says:—“To fill a man with heterogeneous scraps, from the Mahabharata and the Sheking down to ‘Pickwick’ and White's ‘Selborne,’ may pass the time, but I cannot see how it would strengthen, instruct, or delight. . . . The steady working down of these lists would end in the manufacture of a prig.” Now, as Mr. Morley goes on to say, “a prig has been defined as an animal which has been over-fed for its size.” Priggishness in design is only too real a thing, and it is always marked by exaggerated self-consciousness; but I am far from suggesting that it is inevitable, even where the designer, like a quick-change artist, appears constantly in a fresh character. It is only a shocking possibility.

Before leaving Mr. Morley, I am tempted to make a further quotation, or series of quotations, which contain a truth quite as real for us as for the audience to whom they were addressed. “I have an unbounded faith,” he says, “in the virtue of cultivating direct and precise expression. It is not everybody who can command the mighty rhythm of the greatest masters of human speech, but everyone can make reasonably sure of what he means, and whether he had found the right word. . . . It has been said a million times that the foundation of right expression in speech or writing is sincerity. . . . Right expression is a part of character. . . .” And again, “Truth is quiet; moderation and judgment are, for most purposes, more than the flash and glitter even of genius.” I wish this were more generally recognised by the world at large for whom we have to cater. When we hear work qualified as original should we be right in assuming that it has been conceived and carried out in the spirit which Mr. Morley inculcates, or must we not rather confess to a conviction, born of long experience, that oddity is meant rather than originality, rhodomontade rather than direct expression? Some would say that in the appreciation of the public lies the justification for such work as this. I don't know whether one would naturally go to Addison for an opinion as to the principles which should govern art, but he had a judicial way of laying down the law on general questions, and this is what he says on the point:—“I shall add no more than that music, architecture and painting, as well as poetry and oratory, are to deduce their laws and rules from the general sense of mankind, and act from the principles of those arts themselves; or, in other words, the taste is not to conform to the art, but the art to the taste.” Of course, it is obvious that the fundamental principles of art were evolved by taste and have their basis in it, but not in that of the man in the street. Addison's language is not perfectly clear, but if he meant that the general direction of uncultivated likes and dislikes, at any given moment, is the proper criterion of what is radically good and bad, it is impossible to agree with him, nor does it appear that he contemplated the interference of the public in his own special domain. Mr. Louis Stevenson, writing of the fine arts generally, does, indeed, say that their *raison d'être* is to please the world at large, and that we have no business to try and make our customers buy wares they do not want, but he goes on to expatiate on the intrinsic faculty of the artist's work for conferring happiness on its creator, quite apart from any question of success. “In the wages of the life,” he says, “not the wages of the trade, lies the reward,” and again, “Man's (*i.e.* the artist's) joy may consist with perpetual failure and find exercise in continued chase.” Of the pleasure which his own work gives him he has spoken more than once; the public has the good taste to agree with him, but had it been otherwise, I, for one, decline to believe that he would have condescended to exchange his own reading of his art for a more ample measure of popularity.

To advise the young man to ignore altogether the necessity of getting his bread and cheese is, however, to offer a counsel

* J. Morley.

of perfection. The unflinching prophet of a higher taste or purer aims runs a greater risk of being left crying in the wilderness. Still the heretic of to-day may be canonised to-morrow; how often, indeed, has it happened that the laughing-stock of one generation has become the idol of the next? "Magna est veritas et prevalebit," but it is a question of time. "The books," says Lecky, "which have proved of the most enduring value have usually at first been only appreciated by a very few, and have only emerged into notoriety," as he oddly puts it, "after many years of eclipse." He continues in the following pregnant words:—"There are demagogues in literature as well as in politics; and there is a degradation of style, springing from a thirst of popularity, which is at least as bad as the pedantry of scholars." It is quite true, then, that what the mature judgment of the world ultimately approves is really great; this is the ultimate test: the prophet takes a higher place than the demagogue in the long run, for in this case second thoughts are best and most permanent, and the craze of the moment rarely deserves anything better than the oblivion which is in store for it.

Many a young designer has been infected by the spirit of Impressionism which is in the air. Amid many signs of talent and imaginativeness there is in the Impressionist school too obvious an addiction to novelty of effect for its own sake, though its hideousness may make it quite unworthy of reproduction. Flesh may look dirty to blackness under certain conditions, but there is no reason for so painting it. Still, here is work done on principle, with good intentions, and often with great suggestiveness, and we have no real right to quarrel with it. Speaking of Impressionism I am reminded of an instance, I am afraid somewhat beyond my subject, in which the principle was carried beyond drawing and design into execution, and in an odd way. The work in question was one of great charm, but I felt the presence of a great blot when my attention was arrested by odd and purposeless patches of brickwork and tiles spotted about, sometimes in wavy courses, on the general background of stone. At first I thought it a somewhat absurd affectation of taking any materials which were available at the moment, building from hand to mouth, so to speak, but afterwards I inclined to the idea that it had been done with the object of getting that indistinct and indeterminate effect so well conveyed in the clever draughtsmanship of to-day—which, as a matter of fact, a wall face does present, owing to the limitations of the human eye. The good sketcher only shows that he is, as fond mothers say of their children, "very noticing"; he is repeating a lesson which he has been alert enough to learn from nature. But the architect here tried to work back again from the reproduction, as if nature did not know her own business, and the result was to rivet the eye at once with an oddity, and to make one lament that a charming piece of work should be marred by a restless and conscious endeavour to be clever.

But if there are some who fly to excess on principle, there are others whose proceedings have not that excuse, who argue, seemingly, that as isolation is possible in the midst of a crowd, so it is possible to be original in company, to be somebody else and yet yourself, but I think that those who "convey" a startling feature, or a reminiscence of one from somebody else's work, with a vague idea that in thus showing their appreciativeness they participate to some extent in the credit of a piece of design, to which none may have been due in the first instance, become, as it were, accessories after the fact, simply pile Pelion upon Ossa in the reduplication of mistakes; the step from originality misunderstood to a veiled plagiarism may not be exactly that from the sublime to the ridiculous, but the pettiness and absurdity of the latter are incontestable. Nothing is more contagious, nothing more difficult to throw off, than this diseased itching for effect, a malady which even blinds the patient to the passing of that critical moment when what he fondly believes to be new has already become stale.

Its popularity is one of the baits which such work holds out; its comparative easiness is another. "To be intelligible," says our latter day La Bruyère, Mr. Oscar Wilde, "is to be found out," but to be unintelligible is either to have no meaning, or to be unable to express it. It has been well said that it is easier to be odd and enigmatical than to be sensible and simple.* It does not take much to collect a little gaping crowd in the street, nor is much thought nor much imaginative power requisite to provoke the attention of a people which is attracted by novelty, however crude. Before the young sailor launches his bark on the sea of architecture he must fill his ears with wax, or the soft tones of the siren of copyism will wheedle him to artistic destruction, and the more easily that he is not completely conscious of the danger he runs.

It ought to be enough to ask ourselves whether eccentricity has ever been a feature of any masterpiece, to avoid it like poison. In the whole sphere of art, is the finest work ever marked by that oddity which, like a joke, becomes positively wearisome directly it is familiar? Has it not rather something of the measured cadence and stately rhythm of one of Burke's

periods, let us say? The test of a work's merit is the degree to which it will bear living with. There is a brilliancy in decay and degradation, like the lights of a festering marshland; it leads its followers into strange and fatal paths, like a will-o'-the-wisp, but the spell is soon broken. Rococo work of any kind is like the bright talker, the paradox-monger, for ever on stilts, whom to meet is, after a little experience, to avoid: the quips and cranks of such work, the pieces of wayward cleverness, like the sharp sayings of a naughty child which amuse us in spite of ourselves, the conceits in which the designers displayed what Poe calls "the mad pride of intellectuality," are just what make it turn to ashes in the mouth.

Art is no art, as the old Latin tag tells us, unless she conceal herself to some purpose; she cannot, as her semblance so often does, plume and preen her feathers for our delight; we soon weary of seeing beauty attire herself. But there is a higher perfection than successful self-effacement, and that is sublime unconsciousness of the existence of an audience. "Suppose the *Venus of Medici*," said Diderot, "before you, and tell me if her nudity would offend you; but put on her feet a pair of dainty embroidered shoes; fasten to her knee with a rose-coloured garter a clinging white stocking, and the whole difference between the decent and the indecent will be apparent to you at once. It is the difference between the woman whose charms one sees and the one who displays them." The highest art, to my mind, is neither that which courts display nor that which wears a veil; but that which, like another Eve before the fall, knows no need of one, whose beauty is there without reserve, patent to all men if they have eyes to see, and so perfect in the harmony of all its parts that to know it familiarly is to light upon a fresh charm every day.

There is an old German story, of which there are many variants, of a certain charlatan who professed the highest skill in fresco-painting, and his art had this peculiar feature, which, of course, enhanced its monetary value, that it was invisible except to the eye of wisdom. Commissioned by some royal highness to decorate the walls of a saloon, the pseudo-painter went on interminably pawing the air with his brush; of course, neither king nor courtier could see what did not exist, but they were not the less lavish with their praise, and if a suspicion ever entered the mind of any one of them he had not the strength of mind to speak out, and run the risk of labelling himself uncultivated. The point of the fable is obvious enough, if not to our present purpose; but I think we may take the thief's qualification of his work as a scathing sarcasm on public taste, and the behaviour of the king and his court as an equally bitter commentary on the power of fashion, and the hollowness of much apparent appreciation. The highest art, after all, appeals to a comparatively small circle. Its beauties are as invisible to the uneducated eye as the frescoes of Owlenglass to his patron. Its very harmoniousness and unity give it a reticence unappreciable to those whose eyes are focussed for the brilliant and the garish; but, as I have already said, it is only a matter of time. No really great work has ever lacked recognition in the end, and if a man is to reach his highest level of production, it must be by working in accordance with the promptings of his conscience, and not by grasping at the shadow of popularity.

I pass on now to those, and they are not a few, who, in an exaggerated reliance on their own fertility of invention, are not content with simply being unlike other people, but spend their lives in the effort to be unlike themselves, who discard what circumstances suggest, or even what convenience dictates, merely because the solution bears a near resemblance to one already arrived at, of whose style you can predicate nothing with certainty, so successfully do they mask their predilections, so sedulously do they cultivate variety. Such instability, combined as it frequently is with great talent, seems to me perfectly inexcusable, not less so than a corresponding degree of moral irresponsibility would be. Just as you can assert with confidence the action of a friend, whose character is known to you, under given circumstances, so you ought to be able to recognise the artistic touch, the individual impress, of one with whose work you are familiar.

Cornelius O'Dowd said years ago that no man of really commanding intellect or strong character was ever to be looked for among those adepts at foreign languages who make them their own in so real a sense that their ideas, their way of looking at things, become those of the people whose language they are speaking, for that is what intimate converseance with a language means; such a power of adaptability shows consummate cleverness, but is something quite different from genius, both intellectually and morally. "Capacity rather relates to the quantity of knowledge; genius to its quality. Capacity is power over given ideas or combinations of ideas; genius is the power over those which are not given,"* and as with language, the power of absorbing various different styles, of straying without predilection over the whole field of design, and grasping all the little distinctive tricks and turns, which

* A. Birrell.

* Hazlitt.

answer to the idioms of a language, is not a thing to aspire to, nor is it the mark of greatness in its possessor. Genius cannot be commanded, of course: in its intellectual aspect it offers a bare precipice of rock, the top of which no one can reach except on the wings of a divine imagination, but in so far as it is a moral quality we may and ought at least to gain its outworks.

If a man has any moral backbone, what he is once he is always; this is not the negation of freewill, since you cannot predicate either freewill or necessity of a non-moral, irresponsible being, nor is the recognition of a man's hall-mark on his work any sign of limitation in his powers; rather it denotes that he has a definite character and settled convictions—in other words, a style of his own; failing this impress his work may be original in a certain sense, but to the higher quality of individuality it can have no possible claim.

It is said that a judge must be told twice what you want him to understand, a special jury three times, a common jury six times, and I think, generally speaking, our attention bears directing with some persistency to what is good and worthy of being remembered, to some form in which its creator finds his most complete expression. It is satisfying to see the growth of the idea in the designer's brain, the process of evolution: this is how nature works, step by step, rung by rung, up the ladder of perfection, and art in its natural state—as it grows, not as it is manufactured—is in strict analogy with nature's processes. The history of our own art can be read in wood and stone, the embellishment of the traditional, the birth of a new inspiration from the ashes of an old one. But turn for a minute to contemporary work, to one of the most interesting and distinctive careers of our day, that of the late Mr. H. H. Richardson, of Boston. There was a man who, once satisfied that he had struck a happy vein, a fitting medium for self-realisation—and he was, like all artistic natures, sensitive and hard to satisfy—was not afraid of working it out, of filling afresh to-day from yesterday's well of inspiration, of playing new variations on an air which was already in the hands of the public, and yet I think I shall be only expressing the general opinion when I say that it would be difficult to find anything more instructive for the tyro in design, or much more delightful for anyone, than the series of libraries and railway stations, so obviously fathered by one man and yet so distinct from one another, for which he was responsible. Mere originality, as such, is simply swallowed up in the strong individuality of a man who, like a true artist, spent himself in the pursuit of perfection.

Production is always a pleasure, but the more complete the self-expression the higher and purer it is, though some never allow themselves the opportunity of making the discovery. Such a mode of work as Richardson's, turning neither to right or left, but advancing steadily along the road which his taste marked out for him, is not only the most moral in itself, but it is that which promotes most highly the welfare of art at large.

If a man arranges his wares like a tradesman to suit the taste of the moment, or if he is perversely determined to fly in the face of his own special talent, if he is for ever turning down byways in the mere restless craving for variety, or the desire to impress his public with a versatility which they do not suspect, he will be selfishly sacrificing his art to himself, and will have no one but himself to blame if his vogue quickly passes. To do a popular piece of work rather than a good one is to offer up the future on the altar of the present, to eat up your capital instead of living on the interest. You will make a greater show at the moment, but you will not cut up so well in the event.

The game of art is like the game of cricket: the cricketer may keep his own average or his analysis in his mind's eye, of course, but, primarily, he has to play for his side, and may be called upon to make a sacrifice. Unselfishness in both cases is little less to be cultivated than actual skill, and the true artist will be ready to sink himself in the spirit which is the mark of true sportsmanship.

If, then, I am not disposed to deduct one jot from my esteem of a man who turns again with fresh zest to his own imaginings, I am no more inclined to quarrel with those in whom lies the power—the sign and seal, this, of greatness—to make everything their own on which their hand falls. I say boldly that the great artist cannot plagiarise from his insignificant brother, however largely he may draw on him for material. The medium of expression is a matter of comparatively small importance, but it is quite as possible to be original in the treatment of an old theme as in striking out a new one. D'Artagnan existed in real life before Dumas made a demi-god of him; Handel laid violent hands on a thirteenth-century French air, and transformed it into the "Harmonious Blacksmith." Yet who would be so absurd as to give two thoughts to its origin? There may be some who, in the spirit of Carlyle's Dryasdust, follow up the mighty river of Shakespeare's creations to a fountain-head in Plutarch, or tax Burus with having founded his "Cotter's Saturday Night" on Ferguson, or his Epistles on Ramsay, but to what purpose are such criticisms unless it is to show to what pettiness the critic's craft at times

obliges him to descend? So far as regards the subject of their animadversions they may be summarily put aside. To put the warm breath of life into Pygmalion's cold marble, that is what genius does to the subject matter which it usurps. How little the strong man feels the indignity of borrowing may be instanced by Richardson's proceedings in the case of his design for Trinity Church, Boston. Mrs. Van Rensselaer, in her interesting account of him, tells us how he cast about, for some time in vain, for a motif for the central tower of the church, till he happened to come across a photograph of the lantern of the old cathedral of Salamanca. He saw his opportunity at once, and, bold as he was in presuming to treat so fine a conception as his raw material, he justified his action by the result. His own impress is nowhere more perceptible than it is in that tower, and yet it is still Salamanca, just as Salamanca is at once itself and Vendôme.

The author of the "Bible in Spain" has given us in his delightful book, "Lavengro," a view of the other side of the question, in his representation of the author whose mania for what he understands as originality leads him to distrust the very breezes for fear they should whisper something which the inspiration has already suggested, and so make it valueless. He cribs, cabins, and confines himself in the attempt to say nothing which has ever been hinted at before. His imagination chafes at the bit, but he curbs it in remorselessly, and if he did not succeed in turning a mettled courser into a common hack, it was because the scales fell from his eyes before it was too late. This is the *reductio ad absurdum* of the foolish purism which has its foundation in selfishness, and is as little to be admired as are the arts of the plagiarist.

But the master mind will turn men to its own purpose as readily as their ideas. It has been said, I believe, that if Bach had devoted every minute of his time to composition, he could hardly have produced the volume of work which not only is his in name, but is indisputably so in character. Everyone knows, again, though no one can quite understand the manner of it, that the elder Dumas was the presiding genius, in every sense of the word, of a colossal literary manufactory, the Vulcan in an intellectual smithy, from which a stupendous amount of work, good, bad and indifferent, was turned out, in which much was very good, little was wholly bad, and all was individual. He had his detractors, of course, gentlemen whose superior sharpness enabled them to credit the various ghosts with most of the merit of the work, but such a contention was absurd on the face of it: the books which I hope many of us have found time to read are the work of one man, whoever he was, and the mediocrity of even the best of his workmen—such as M. Maquet—when left to their own devices shows that that man was Dumas. It is an old, old story, a serial that will run till the crack of doom. Perugino's saintly Madonnas and adoring attendants, in which the personal equation seems to go for so much, were turned out by the gross, as Professor Symonds has told us. But, to revert once again to Richardson, whose manner of work is, after all, more immediately interesting to us, nothing could illustrate more completely what I have said than his practice. This is not the occasion to discuss whether his attitude towards those he employed was generally better for their artistic training than the more usual one or not, but so suggestive was he, so subtly did he work on his assistants by hint and criticism, rather than by direct illustration of his meaning or his wishes, that they appear themselves hardly to be able to tell us how they were made to carry out his ideas; yet he was in his way as individual as Dumas, and his death has displayed little less cruelly than that of the great novelist, how paramount that influence was which was kept so consistently in the background, how veritably the divine spark which illumined his work was in him and in no one else.

I suppose I need not trouble myself to sound a note of warning. It is obvious enough that so masterful an appropriation of other people's goods is not for all; indeed, it is for very few. Most of us are fitted by nature to play the part of the tool in the master-hand rather than that of the master-hand itself, and if we meddle with other men's work in the ambition of absorbing it and making it our own, we shall probably find that it is too strong for us, and that, instead of the dog wagging the tail, the tail is wagging the dog. To foster copyism for a moment is fatal; for, if we do so, we may find that, like another Frankenstein, we have reared a monster too strong to subdue.

I conclude by addressing a few words to the younger among my audience. You will have gathered, and, indeed, it hardly needs the telling, that originality in the highest sense of the word, or individuality—for the two are practically synonymous—is not a thing which can be commanded. But the humblest of us have something to express which may be of interest without shaking the foundations of the world, and if we have not the power or the will to approach our work freshly, to rely frankly on our own inspiration, or the results of our own thought, then architecture was not meant for us, nor we for architecture. Mere bookwork, mere accurate reproduction and formal arrangement of traditional forms is hardly worthy of the name of architecture; it is a mechanical process, devoid of all vitality, and can

give no real pleasure to the producer any more than to the consumer. But, taking it for granted that your natural endowments are not so limited as this, I ask you to try to approach your problem as if it had never been solved before. Do not think of precedent for the moment, either to adhere to it slavishly, which is folly, or to outrage it, which is insanity, but consider the special circumstances in which you are placed, without reflecting that they are usual enough, the requirements which you are bound to fulfil, and the effects you are going to produce, in pure unshackled self-reliance. Your training will stop you short of the commission of an absurdity, your intelligence will tell you when the general consensus of opinion has laid down certain laws either for the provision of comfort or for the satisfaction of taste, which are, so to speak, immutable and must be abided by, but it will tell you, in the same breath, that tradition is not everything; that the brain of humanity is busy devising fresh tools for your hand every day; that there is such a thing as running in a groove from a simple unquestioning acceptance of things as they are, when the circumstances which dictated the particular course may have long changed. It reminds me of the story of the sentry whose charge was a grass plot in the neighbourhood of the Winter Palace at St. Petersburg. One day the Emperor, who had seen a sentry on duty there a thousand times without giving it a second thought, happened to ask what particular duty the man was fulfilling, or why he was there. No one knew, till the oldest inhabitant, or even perhaps some musty record, revealed the fact that a reign or two previous a soldier had been placed there one day to prevent a crocus from being picked. We must assume that the crocus had died in the interval, but still officialism clung heroically to tradition, and that is exactly what the less imaginative minds among us are in danger of doing. Think everything out and accept nothing without question. Originality, believe me, is not necessarily spontaneous in character; it lies just as much in thinking out as in rapid conception, in labour as in impulse, and it must belong to the essential form of your work, be really part and parcel of it, not be thrown over it at the last moment like drapery over a lay figure.

If the question is put why have you done so and so, a sound reason should always be forthcoming. This is a somewhat severe test, but a genuine one, and is more likely to be passed successfully if your originality starts with the first thought you give your subject, coexists with its first formulation, and consists not so much in the treatment of a feature as in its presence. I say, think everything out for yourselves. To ignore tradition is like sitting down to write on a well-known subject without having made yourself master of the literature which bears on it, but if our education to-day bears fruit, the young designer will carry much of the lore of his subject in his brain in a more portable and infinitely more useful form than that of books, because it has passed out of the sphere of the mechanical into that of the instinctive. Perhaps I may illustrate the value of looking at things with a fresh eye by a short quotation from some remarks made by Mr. W. B. Richmond before the Art-workers' Guild a year or two ago.

"Why do you architects," he said, "in all, or most, instances make the windows of every sitting-room in a London street to come down to the ground, or nearly so? I have often looked up at that dark strip of wall above the three windows of a London drawing-room, and on the wall between the windows, where, usually, a looking-glass is placed, because nothing else would be visible; and I have wondered why someone does not make one long window the whole width of the room, right up to the cornice, and about 5 feet from the ground, divided by three brick piers, on which might be placed, on the inside, beaten metal-work after the design of a pilaster: the same treatment might be adopted for a dining-room, and would be especially valuable in a library," and so forth.

I suppose Mr. Richmond hardly intends to make architects responsible for the ordinary London house, and I do not mention the particular suggestion as being quite novel; but it serves to indicate the frame of mind in which the most time-honoured situation, treated a thousand times in the same way, should still be approached on the thousand-and-first occasion.

The late Master of Trinity College, Cambridge, once said, in his quietly sarcastic way, "We are all liable to be mistaken at times, even the youngest of us." To be cocksure is, indeed, the happy privilege of youth, as are enthusiasm and many other pleasant qualities in which chill old age would be only too glad to participate, but I ask you to remember that even amongst the most highly-gifted, or perhaps I should say, especially among the highly gifted, during the period in which the artistic character is being formed, self-reliance should be tempered with self-restraint; eccentricities may be perpetrated under a sudden impulse which please their author at the time because they express his mood, but when one is older and wiser, or at least more circumspect, it is pleasanter not to have the indiscretions of an ill-disciplined youth standing there in all the durability of

brick and stone to point an untiring finger of derision at one.

A vote of thanks was passed to Mr. Street for his paper as proposed by Mr. Millard, seconded by Mr. Mountford and supported by Mr. Woodthorpe and Mr. Hooper.

THE WOODS AND THE ARCHITECTURE OF BATH.

IN a lecture at the Bath Institution on "The Two Woods and the Bath Renaissance," Mr. R. E. Peach began by referring to the difficulties placed in the way of the Woods by the grasping nature of the owners of the land, and the patience and sagacity needed to overcome these. One of the earliest and grandest conceptions entertained by Wood—in 1726, the year before he settled in the city—was a street to be called Berton or Barton Street. It was to have been 1,025 feet long by 50 feet in width, but for various reasons this intention was abandoned, a resolution which they had no reason to regret, seeing the direction it was to have taken from Old King Street, and how it must have changed the whole course of subsequent operations. One great difficulty in the early part of his career was to get experienced masons, joiners and carpenters, all of whom he employed from London. Amid many arduous undertakings apart from his grand building schemes, was canalising the Avon between Bath and Bristol, in 1727, earlier attempts at which had failed. He was employed upon the work by the Duke of Chandos, for whom, about that period, Wood built Chandos Court, as it was called, and restored St. John's Hospital. One of the most interesting, as well as important, historical institutions with which Wood was connected was the Royal Mineral Water Hospital. They were accustomed to think of this noble institution as having its origin in the benevolent instincts and conceptions of Beau Nash—a total misconception. The hospital, so far as it owed its existence to any one man, owed it to Wood. Two old houses, some outhouses and the old theatre, built in 1705—plays in which were rendered illegal by the Act just then passed—were acquired, cleared and prepared for the building, the first stone of which was laid on July 6, 1728, and the hospital was opened May 18, 1742. For all his labours and professional services at the hospital Wood charged nothing. The work they all admired, and further, they admired the good taste of the architect to whom the task was given of enlarging the building, in not departing from the style of his eminent predecessor. The lecturer said it would be scarcely worth his while to occupy much time in describing at length the minor works of Wood beyond the precincts of Bath. In 1748 he built that exquisite house at the end of the sloping avenue at Bathford; he also erected the Shockerwick mansion, but it was not mentioned in his book for the obvious reason that it was built subsequent to the publication of the work. In the later structure no decadence in the architect's peculiar genius and executive power was to be observed; on the contrary, the edifice seemed to present in a marked degree all the excellence and characteristic sweetness by which the greater part of his creations were distinguished. There was one thing, however, which Wood certainly could not do, and yet with the perversity and self-delusion which sometimes misled great men, it was precisely a work in which he thought himself pre-eminent, and that was building a church. He wanted to build St. Michael's, the predecessor of the present, an edifice entrusted to a man named Harvey, whose production would have disgraced a village mason, both as to style and insecurity. Wood, as a rival, built St. Mary's Chapel, in Queen Square, a structure eminently adapted to the music-hall style of edifice. On entering it one felt an unholy desire to "light up" and call for a "drink." One redeeming feature it possessed, and that was the portico, which was a tetrastyle of admirable proportions. This part of the structure was still preserved, and might yet adorn an edifice worthy of it. Having referred to Wood's decease in 1754, and his burial at Swanswick, the lecturer said it might be assumed that some of the streets and buildings were in contemplation before his death, although a considerable interval elapsed between that event and the beginning and completion of the buildings with which Wood's name was associated. The circus was some years in course of erection, but it was quite clear that in the plan of that sumptuous pile many of the streets were contemplated which were not begun until some years after. In 1762 the circus was two-thirds completed, and he had reason to believe the work was finished in 1764. Simultaneously with this, however, another undertaking was going on—the erection of the York House, or, as the pile was called, York Buildings. Architecturally there was little to be said about the York House. Wood was hampered by two conditions, namely, to get as much room as possible inside, while leaving the largest amount of space outside. Still, he dealt internally with the house with his accustomed skill and success, and the building in the coaching days was one of the most famous hostleries on

the road. Brock Street followed the circus in 1765, and was finished in the following year, the chapel being erected by Wood in 1773. They had in the latter an illustration of Wood II.'s incapacity to build an ecclesiastical edifice. In Woolley Church there was precisely the same incongruity, the same apparent incapacity of the architect to conceive any higher ideal of a place of worship than room and comfort, both, no doubt, important, both, however, attainable with all the higher attributes of a Christian temple. There were many who would be inclined, and perhaps rightly so, to regard the Royal Crescent as the *chef d'œuvre* of Wood II. Personally, however, he ventured to proclaim the Assembly Rooms as his masterpiece. The former was begun in 1767, two years before the latter. In these two great works they had the most notable example of this eminent architect's discernment and self-restraint. In building these thirty mansions he saw precisely what was the most fitting in form, in style and character. The elevation was one of unbroken uniformity, although, from the architectural requirements, the bedrooms did not meet the wants of the present day. There was one peculiarity of this grand range of mansions which he might point out. It would be perceived that the architect adhered to the simplicity which was compatible with Classic grandeur, and that he carefully avoided meretricious surface ornamentation. The windows and doors were simplicity itself, and the effect of the whole was produced and maintained by the perfect line of beauty. In building the Assembly Rooms, now 120 years ago, Wood showed his power, his foresight and refinement: power, in adapting a difficult site to the great purpose in hand; foresight, in his plan which was to meet the changes and accidents of time; refinement, in the shape and exquisite adaptability of the various rooms and their harmonious grouping and relation to each other. If he had been a vain man he might have bestowed his ingenuity on grand external crockets and ornamentation, but he not only understood that the duty imposed upon him related to external distinction and beauty, but also that in carrying out the work in this spirit this great man was rearing a monument to his own professional memory. Still these rooms defied rivalry, still they might travel far and wide and exclaim that no such rooms were to be seen in the length and breadth of the land.

RESTORATION IN SCOTLAND.

THE discussion on the presidential address by Mr. W. W. Robertson, of H.M. Board of Works, on "Our Duty in respect of Ancient Buildings," which we published last week, was opened at the Edinburgh Architectural Association by Dr. R. Rowand Anderson. He stated that his views were diametrically opposed to those of the President. He contended that they were not entitled to stop the history of a building, say, at the Perpendicular period or any other period. The history should be allowed to go on, and the fittings and furniture that marked these periods should be allowed to remain. Dr. Anderson proceeded to examine the illustrations Mr. Robertson gave in support of his views. With his remarks about the removal of the Tron Church, and the retention of the Royal Exchange as the official home of the municipality he entirely agreed. It was to be devoutly hoped that the civic authorities would not desert their present building. It occupied a magnificent and central site, and it possessed all the merits Mr. Robertson credited it with. In addition, it represented a time when they had a vernacular architecture, and if he read the signs of the times aright they were likely to abandon it, using many of the restless and effete phases of art in place of the restful and dignified and common-sense architecture of that period. With regard to buildings which were in use, our life and comfort depended on keeping them in a state of repair, and that implied changing them more or less from time to time as views of comfort and civilisation and everything else changed. With regard to buildings in a ruinous condition, he maintained that if the building was capable of being utilised there was no other way of preserving it except by using it, and that involved that it must be subjected to all the changing phases of the time and the necessities of the case. If buildings were to be restored for the simple purpose of showing the original design, he was not prepared to condemn that view of restoration, but if a building was to be restored for use, he held that the architect, while jealously preserving all that was old, had to meet the purpose to which the building was to be devoted, even if thereby he had to depart from the original plan and make additions that did not conform to the original style or design of the building. Although he was not prepared to carry this view to too great detail, he thought they should follow the example of the builders of old. He instanced the case in which he had been concerned of the restoration of the cathedral buildings at Dunblane. Through that restoration the cathedral would be handed on to future generations, and that would not have been

the case if the building had been left in the ruinous condition in which it was some years ago. He admitted that from a pictorial point of view much of what the painter might see in it had not been left, but he maintained that buildings were not erected to make picturesque studies for painters. Old Dunblane Cathedral, he contended, was still there, and he had repaired only where structurally necessary; otherwise they would have had a ruin tending to further ruin.

Mr. G. S. Aitken followed in general the views expressed by Dr. Anderson as to restoration, and indicated the view that sentiment should not be allowed to stand too much in the way of restoration. As to the Edinburgh Municipal Buildings, however, he questioned what influence for good these had upon the citizens of Edinburgh.

Mr. S. H. Capper argued that the view of restoration must depend on the state of the case. If the building was a museum specimen, let it remain *in statu quo*. If it could be used, let them make the highest use of it; and he maintained that Dunblane Cathedral gained by its nineteenth-century work.

Mr. Thos. Ross argued in favour of restoration where admissible. The admiration for ruins as such was, he said, quite a modern craze, and the men of the Middle Ages showed by their practice that they had no such idea as the President enunciated.

Mr. James Bruce, W.S., spoke of the case of national buildings put to misuse, and he instanced the Castle Hall at Stirling, now turned into barracks.

Mr. Robertson, in replying to the discussion, maintained that the preservation of an ancient building, always supposing that it was worthy of preservation, should take precedence over every other consideration. With regard to restoration as a means of preservation, he had not a single word to say against it. It was restoration of a different sort that he had tried to condemn most absolutely. If restoration was to be carried on with the main view of preserving everything that was valuable in the building, and if that was put before everything else, he thought that such restoration was in every way desirable.

MEASURING EXTRAS.

ANOTHER case in which the prescribed charges of the Royal Institute of British Architects were irreverently treated as waste-paper by a judge was heard at Nottingham last week. According to the *Evening Post*, Mr. George Edward Statham, architect, sued Mr. Alfred Axe, builder, Derby, for 12% for professional services in connection with a contract for alterations and additions to a house in Derbyshire.

The plaintiff stated that he was employed by the defendant in the year 1891 to prepare plans for the alterations. A contract for 1,150% was prepared, but the total amounted to 1,497% 14s., for which witness certified, and upon which he was paid his commission by the owner of the property. That amount included 12% for measuring up the extras, and he had charged his commission on that in the general account. In cross-examination he said that was the 12% he was now demanding in accordance with the invariable custom of the profession. The defendant refused to pay him, and he could not distinctly say that the defendant promised to pay that particular amount.

Mr. Goodall, architect, Nottingham, gave evidence in support of the plaintiff's contention as to the custom of the profession.

Mr. Daly said he intended calling the defendant to deny the alleged custom, and to deny any agreement on his part to pay the amount claimed.

His Honour did not think it necessary for Mr. Daly to call any evidence, and proceeded to give judgment.

The judge said this was an action by an architect employed in a professional and fiduciary character to prepare quantities in connection with a contract. Extras were added to the contract, amounting in the whole to 450%. The architect gave his final certificate for 1,497% 14s., and included in his charges 12%, the cost of measuring extras. The plaintiff endeavoured to establish his claim by reference to a rule of the Royal Institute of British Architects, which excluded from the scale the 5 per cent. or the 2½ per cent., as the case might be, charged for measurements. He (His Honour) should imagine that an architect was entitled to make an extra charge, but such a charge as that could not be allowed, and even if customary could not be supported in any court of law. In the first place the plaintiff actually increased his client's bill by that 12%, and charged him commission on it. That clearly showed that the architect who made a charge such as that had an interest adverse to that of his client, and upon that point alone it was quite impossible that the plaintiff should be allowed by equity of common law to recover any such charge. He was sorry to hear that it was the custom of architects to make such a charge as that. He was quite sure no court, either in law or

equity, could uphold it. He non-suited the plaintiff. His Honour added that he did not make his observations so strongly as he wished, but he must point out the fact that the account sent to the customer carefully omitted any allusion to the 12 $\frac{1}{2}$ per cent. commission, and Mr. Statham himself very fairly said that his client would be under the impression that 5 per cent. commission was all he got. If there was any such practice in the profession it was a dishonest custom, and one he should not allow to be sustained in that court, nor did he think any other court would allow it.

Mr. Daly applied for costs.

His Honour, in granting the application, said it was, no doubt, an important question. He altered his decision to a verdict for the defendant with costs.

STAFFORDSHIRE TECHNICAL SCHOOL.

THE Technical Education Committee of the County Council have invited Staffordshire architects to submit plans for the offices, classrooms and laboratories the committee intend to erect on the site they have purchased from the Corporation of Stafford, in Victoria Square. The designers are to show two frontages—one to Victoria Square, with part to Cherry Street on the south, and the other to Earl Street on the west. Several existing buildings will have to be demolished, and the new building is to be of a substantial character and fireproof. The accommodation to be provided is to comprise four rooms for offices, varying in size from 20 feet by 18 feet to 14 feet by 12 feet; an educational library and a committee-room, 26 feet by 18 feet, but the designers are not limited to shape or even size, the figures merely indicating the amount of space required. Provision is to be made for a chemistry classroom, a science classroom, a teaching laboratory, and four rooms for apparatus, balance-room, and two small laboratories; for an art classroom and an art-room for modelling, and for a cookery kitchen and classroom. The building will also include a residence for the director, with a dining-room, two bedrooms and study, bath-room, &c., and also a caretaker's house near the same. Storage accommodation is to be provided, and space for the agricultural sub-committee's travelling dairy van and dairy appliances for cookery utensils, stoves, &c. Space is also to be found, if possible, for a museum of sanitary appliances, with an area of not less than 1,000 square feet. The plans are to be sent in by April 8.

THE ESCURIAL.

A PAPER left by the late Mr. Theodore Child on "The Escorial" appears in *Harper's Magazine*. The writer says:—The first impression made by the Escorial is its immensity, and the last its melancholy. There is no getting away from the place. It nearly fills the little town of Escorial, for naturally a monument built in the shape of a gridiron to recall the instrument of torture on which St. Laurence suffered martyrdom is rather straggling. The immensity of it takes your breath away; it is not a palace but a cyclopean town, and although the sun may be shining brilliantly, it looks sad and funereal with its grey walls picked out with staring joints of white mortar, its leaden roofs, its granite-paved surroundings, its volcanic aspect. This impression of something burned, blasted, plutonian, of something that has passed through raging fire, struck me time after time as I looked upon the structure. Nor is this idea of fire inappropriate. The palace-convent itself is built in the form of a gridiron turned upside down, and that in memory of the patron San Lorenzo, who was broiled by Valerian on a slow fire, and according to Prudentius, bore his martyrdom with coolness and even jocose irony, for when one side was roasted he had himself turned, and invited his cooks to try whether he tasted better underdone or well done. . . . The surface occupied by the edifice is 39,000 square metres; the exterior façades measure more than 800 metres and are pierced by 15 doors and 1,128 windows; in the interior there are 16 courtyards, 86 staircases, 88 fountains, 9 towers and 4,565 rooms; in the whole edifice there are more than 10,000 windows and 2,000 doors, while the lobbies, cloisters and courtyards measure in length some 75 miles.

The chamber of its founder, Philip II., is thus described:—With a chill of mysterious terror you pass through a low door, and find yourself in a simple room, with a tiled floor and bare whitewashed walls, relieved at their base by the usual blue and white tiles. The room is lighted by three small windows glazed with old rough glass, through which may be seen vast landscapes of dark verdure and grand mountain silhouettes, which prove that the morose king was not so ill-advised as some writers state when he chose the site of his cloistered palace. This is the room where Philip II. lived in monastic simplicity, and boasted that from the foot of his mountain he governed the Old World and the New with 2 inches of paper. The carpet of matting, interwoven with gold, and with

the double-headed Imperial eagle in red, is now hung up against the wall, and the red tiles of the floor are bare. Here is the table where Philip used to sit and annotate State papers; here are his portfolio, his inkstand, his set of pigeon-holes; here is the smaller table of his secretary, Antonio Perez; here is a miserable armchair, studded with brass nails, and with a leather back stitched into checkers. On this chair the king used to sit; and on these two stools, with their cushions of greenish-brown velvet—the one stool bearing still traces of red lacquer, the other of black wood bound with silver—His Majesty rested his ulcered legs. In the alcove to the right the great monarch slept on a bed doubtless as vulgar and even sordid as the chairs and tables of his sitting-room. Next to the alcove is a dark oratory, with walls of polished and panelled jasper. Touch a spring the panels open, and reveal the grand altar of the church; and on the opposite side, in gilt bronze, the group of Charles V., kneeling in eternal prayer, with the women of his house beside him. In this narrow oratory Philip, in 1588, took to his bed suffering tortures, his body devoured by sores, wasting away literally like Job upon his dung-heap. Through these narrow openings in the jasper panels, with which the irreverent fingers of curious tourists now play, the monarch, worn out with care and sickness, peered with anxious eyes as the priest celebrated mass amidst the splendour of the *capilla mayor*. Here, in this narrow, dark and close corner he died. An inscription on the wall records the graphic summary of his end:—"In this narrow chamber died Philip II. when the world was too small to contain the son of Charles V. He lived so far from the earth that his soul alone was living; of his body there remained but the shadow when he finished dying."



The Future of Architecture.

SIR,—I will now, with your permission, attempt to define what is necessary to bring back vitality to British architecture, for, as I said before, to be deserving of the name it must not be a stale copy of a past and defunct style. Though originality is my theme, no originality on my part is required, for the subject has been long ago well worked by such men, to go no further back, as Fergusson, Memes and Wyatt. I may therefore put what I have to say in the briefest language.

Architecture possesses an individual organisation, has its own particular and distinct province, and has its character impressed upon it by nature. Science is ever present. The basis of the art rests upon practical considerations quite as much as upon those of beauty, with the result upon the spectator of the strongest impressions of sublimity which it is in the power of any of the arts to produce. There is a tendency to create specific variety of form the moment the imagination is excited; hence the origin of past and differing styles. Every race, in building temples to God and monuments to man, struck out something different to all the rest. But there were two principles ever co-existent—the one permanent and common, the other fluctuating with surrounding change of circumstances, and creating evolution and development—style. In all ages the materials employed in architecture have exercised a most potential voice over its form and character. The law, however, which determines their arrangement is universal, arising from exigencies over which taste or ingenuity exert only limited control. Imagination comes in contact with reality at every step. Beauty becomes here not the creation of phantasy, but the creation of science. Hence perfect architectural beauty is the most sublime and the most rational of objects of taste; for, while the susceptibilities of the mind are awakened, the powers of the judgment are gratified by the certainty with which the sources of pleasure can be traced. We feel the arrangement to be beautiful: we know that it is necessary. Thus the Egyptians and the Greeks rightly placed this study of materials first in order of all those which must engage the architect's attention; and perhaps herein is our salvation—the origin of a new and vital modern architecture.

Certainly, to my mind—and I have thought much about it—nothing would improve the urban architecture of our day more than substituting for the use of such dangerous and costly materials as Portland and other limestones in the fuliginous climate of London the custom of the Egyptians in the use of that noble material, granite. It exists in abundance in the United Kingdom. Machinery has been invented for its economic conversion, so that, if properly used, it is no more costly than elaborate freestone. Its beautiful tints range from pink to rose, French grey to slate, bright green to bronze, and from white to black. It is of everlasting durability. Smoke

and rain have no effect upon it. The chief difficulty would be the designing of an artistic treatment, in which two or more of its hues were made to combine harmoniously with great simplicity of moulding. HERMES.

Glasgow—Past and Present.

SIR,—A new broom sweeps clean. Mr. Newbery, of the Glasgow School of Art, is a comparatively new knight of the brush in Glasgow, and his critical and artistic eye has been recently taking, as it were, a clean sweep of the architecture of that city.

It seems that when the Macaw-lay New Zealander visits us he will, in the second city, find nothing worthy of his sketch-book except the Gothic cathedral of Sanct Mungo. Sir Walter Scott says:—

If thou wouldst view fair Melrose aright,
Go visit it by the pale moonlight.

And it may be that the pale, cold, reflected light of the melancholy moon may help the tricks of strong imagination to see in some Gothic structures vague and insubstantial beauties—the vision of a fabric (not “fabric of a vision”)—that melt into air, into thin air, beneath the beams of the “one eye that vieweth all the world.” But neither beneath the glimpses of the moon nor under the steady shining of the sun does Glasgow Cathedral, in at least the south front—that which is most exposed to view, the front which is chiefly seen by those tourists who flock to stare at the stained-glass windows as they do to gaze on the marble prettinesses of the Municipal Buildings—show any of that picturesqueness of composition which so eminently characterises the great Gothic works of England and the European continent. The sky-line is as horizontal as is that of a Greek cornice, the general effect being that of a big box with a great wedge driven through it from below at about the centre. There is no “breaking-up” by pinnacles or transept—although an abortive transept was strangled in its birth—and the projection of the buttresses is too slight to give depth of shadow. The only pretension that this front ever had to picturesqueness was before the gutty steeple and the consistory house were destroyed some years ago, “the craftsmen” of these enlightened days not rising to the defence as did those of the Dark Ages. And with this destruction the west front was also curtailed of its fair proportion, and left about as weak as was Samson after he had had his locks shorn. Besides, our boasted Gothic patriotism and Presbyterianism quietly submitted to have the wee Scottish lion dethroned from the apex and a prelatial crucifix elevated instead to the coign of vantage. The north-east is the only prospect of the cathedral in which there is much of picturesque composition; but this is not the view sought or seen by the stranger, unless he be an architect, a critic, or an antiquary. One of our own citizens, the late A. D. Robertson, who was as familiar as most with all the outs and ins of the venerable fane, saw with the keen eye of an artist in this grouping, as seen from the Firpark necropolis, the possibilities of a picture. The “possibilities” were in the corner. In a most masterly indian-ink picture the “long-drawn aisle,” &c., were drawn well towards the vanishing point.

The interior, however, of the cathedral is exceedingly fine both in general effect and in parts, the nave and choir being lofty, with their width well related to the height, while repetitive parts are almost as rhythmical as if they had in some wise been favoured by the spirit passing over them that in distant climes and times had moulded into other forms subordinate features of some Classic temple.

It is often complained of public buildings that they are so “cabin’d, cribb’d, confin’d, bound in,” that they cannot be seen in all their proportions; other buildings so press upon them that they can be seen in only part and parcel; but the site of Glasgow Cathedral is “as broad and general as the casing air,” affording the most ample opportunity for beauties and defects being easily seen, examined and criticised, an isolation that keeps at a respectful distance all objects unworthy of assisting its fair square outline in the composition of a picture. With the Hie Kirk, as with Hamlet, “the time is out of joint”; its old and picturesque surroundings have been improved, and its new are so “up to date” as to be incongruous and unsympathetic.

The cathedral has been long with us, and as Dr. Johnson says, “antiquity, like every other quality that attracts the notice of mankind, has undoubtedly votaries that reverence it, not from reason but from prejudice.” But towards the “high top, bald with dry antiquity,” there may be not only reverence but love. However, as the old critic adds, “all perhaps are more willing to honour past than present excellence; and the mind contemplates genius through the shades of age as the eye surveys the sun through artificial opacity. The great contention of criticism is to find the faults of the moderns and the beauties of the ancients.”

Whether Diogenes would have been more successful in his broad daylight search for an honest man if he had left his

lanthorn, lit or unlit, in his domiciliary tub, or whether Mr. Peter Quince, as carpenter, stage-managed to bring moonlight and wail into the scene in the wood near Athens, we know not. We may, however, perhaps be able to see in Glasgow, by the unaided light of the god of day, other buildings than our cathedral that may be worthy of being sketched by the future New Zealander—the portico of the Royal Exchange, by Hamilton; the Wilson Street front of the County Buildings, by Clarke & Bell; the portico and arches of the Royal Bank, by Elliot; the steeple of St. George’s Church, by Starke; the façade of the Commercial Bank, by Rhind; the porticos of Caledonian Road and St. Vincent Street churches, by Greek Thomson, and his exquisite detail of ornament, unrivalled in its power and beauty, its originality, and its adaptation to purpose; and to these might be added Jamaica Street bridge, were it not that as beauty and utility seemingly nowadays cannot coexist, the latter, the more powerful, has doomed this grand work of Telford—no less an architectural than engineering—to early destruction.

Two stars keep not their motion in one sphere,
Nor can Glasgow brook a double reign
Of beauteous bridge and hideous viaduct.

To descend from public buildings, there are such warehouses as at Madeira Court, by Burnet, and at corner of Nelson Street and Trongate, by Rothead; and as regards dwelling-houses, from those “where merchants most do congregate,” the West-end Park Buildings, by Charles Wilson, to those that are distinguished as so many rooms-and-kitchen tenements in Eglinton Street, by Greek Thomson, perhaps Glasgow cannot be surpassed by any city in the empire. It will be understood, of course, that as we have no nobility we have no “palaces.”

It is not easy to suppose what the New Zealander may do when he honours us with his presence, but, in the words of an author already quoted, “the irregular combination of fanciful invention may delight awhile by that novelty of which the common satiety of life sends us all in quest; but the pleasures of sudden wonder are soon exhausted, and the mind can only repose on the stability of truth”—and perhaps “truth” may be found in those buildings whose design was inspired by that genius which in the art of Greece taught the eternal beauty to the succeeding generations.—Yours truly,

T. G.
Glasgow: February 14, 1893.

The Victoria Concert Hall.

SIR,—In your report of Mr. Moreland’s paper on Steel Construction, you state that the steel work of Victoria Concert Hall was carried out under the direction of Knightley & Phipps. Please correct this.

Mr. Phipps was originally connected with the Hall, but retired before the building was commenced, and has had nothing to do with its construction.—I am, yours truly,
T. E. KNIGHTLEY.

106 Cannon Street :
February 28, 1893.

GENERAL.

The Imperial Institute will be inaugurated by the Queen on May 11. The ceremonial will be “full state.”

Mr. W. A. Boulnois, architect, died on February 23. Lately he resided at Inhurst House, near Basingstone, where, says the *Reading Mercury*, “he was ever striving to do good to others, and it may be truly said that he was beloved, respected and honoured by all, without regard to social, religious or political differences, and has left behind him the bright example of a well-spent, honourable and useful life.”

Plans by Mr. Lloyd Williams, of Denbigh, have been recommended for adoption for the county buildings for Anglesey, but as some doubt about the cost was raised, it was decided to lay the nine plans received in competition before the general committee at a special meeting to be held for that purpose.

An Exhibition of pictures was opened in the Bradford Corporation Art Gallery, Darley Street, on Wednesday evening.

The Southport Spring Art Exhibition, held under the auspices of the Corporation, was opened on Monday in Atkinson Gallery. The number of works exhibited amounts to 835 out of between 1,300 and 1,400 sent in.

Mr. F. Stanier, of Peplow Hall, has undertaken to defray the cost of restoring the old thirteenth-century tower of St. Giles’s Church, Newcastle-under-Lyme.

A Deputation from the Salford Town Council has visited Edinburgh for the purpose of inspecting the provision made by the City Council in the way of artisans’ dwellings.

The Surveyors’ Institution will meet on Monday, March 6, when a paper will be read by Mr. P. E. Pilditch, entitled “Dilapidation Practice, particularly as affected by some recent decisions.”

The Architect.

THE WEEK.

THE duties of borough architects are generally very onerous, and it is to be expected that they must occasionally succumb to their work. At the same time an elected body is in a difficulty when a contingency of that kind arises. Ratepayers grudge all expense on architecture, and they expect their officials to have nerves of steel. In Dublin there is a case of the kind. Mr. FREEMAN, the architect, is suffering, and of course there is inconvenience to all. The circumstances are explained in an extract from a report of one of the committees, which was read on Monday:—"We were compelled in October last to ask the city architect for an explanation of the fact that several matters which had been referred to him remained unattended to, and after an interview with him the following minute was made:—"Mr. FREEMAN attended, and offered as an explanation his continued ill-health and nervousness, and inability to do any work since his reappointment, but undertakes to renew and finish up all arrears of work." This undertaking has not, we regret to say, been fulfilled, and matters have been still further delayed by the absence through illness of the city architect for the last month. If we are to continue to control that branch of the corporate work which involves the management of the city estate, and if the Municipal Council decide to maintain the present arrangement by which the borough surveyor is held responsible for the work of the architect's department, an architectural assistant must be appointed on whom thorough reliance can be placed. The carrying out of such an arrangement must of necessity raise the question as to whether, contemporaneously with the employment of professional assistance of the kind, the Corporation can continue to retain the services of the city architect. We think the Local Government Board auditor might regard as an illegal expenditure the payment of salary to an architectural assistant for the discharging of duties which should be discharged by the city architect. Something, however, must be done to secure prompt attention to the references from this committee dealing with the city property, and, in our opinion, the wisest and best course to adopt would be to take into account the health of the city architect, which since his reappointment has been to some extent the cause of the block of our business in his department, and to grant him a retiring allowance." Some of the members of the Corporation were disposed to deal with the case as if Mr. FREEMAN were to blame, others wished to allow him to retire on a pension. Eventually it was decided to refer the question to a special committee, of which Mr. J. L. ROBINSON, architect, will be a member.

MANY of the recommendations of the Departmental Committee respecting the Ordnance Survey deserve to be accepted, and the money that is required for the purpose should be granted without delay. The 1-inch map cannot be made too perfect, and the facilities which exist for preparing maps with information that is not generally needed obviate the necessity for crowding the general map with lines, figures and names that make it illegible. But as the maps on larger scales are really prepared for the benefit of a few people, it is well to avoid extravagance on them. What benefit can the public gain by having currant bushes in back gardens surveyed with the utmost accuracy? If owners of property or corporations require plans on a scale of 10 feet to a mile or 5 feet, they ought to have them surveyed, or they could easily work them on the main lines laid down by ordnance surveyors and fill in detail. Why should railway companies have surveys of the country traversed by new lines prepared for them at the public expense, for that is the desire which has caused much of the outcry about the necessity of having revised plans? With as much reason purchasers of single houses could insist on having plans of all the floors supplied to them from the Ordnance Office. All the parts of the report which relate to plans on a larger scale than 6 inches to the mile should therefore be considered with caution. If the Statistical Society would undertake the inquiry they would amaze people by the peculiarities of the sale of the maps.

We believe there are many sheets which are never sought after by purchasers. It would, of course, be absurd to limit the survey to those parts which people care to possess; but, on the other hand, it seems waste of money to make surveys on a large scale when ordinary purposes would be served by a much smaller scale.

THE governing body of Winchester College have come to a decision which will cause much dissatisfaction. Our readers are aware that in last May a meeting of Wykehamists was held, at which it was decided to elect a committee to consider the suggestions that might be offered for commemorating the quincentenary of the college. In the course of a month it was decided to confer with the governing body and an architect as to the building of a new chapel, and as to the best means of reseating the existing chapel so as to accommodate the largest possible number, and with or without a gallery on the west wall, but without any structural alterations, and to obtain an estimate of the cost. Mr. J. T. MICKLETHWAITE, F.S.A., was selected as architect. Subsequently plans were prepared for the reseating of the chapel, with the seats running east and west, and for the erection of a gallery at the west end, which, in the opinion of the sub-committee, met the requirements for sittings, and would have made a very great improvement in the interior of the chapel. As regarded a new chapel the sub-committee reported that the proper site for one, should one be built, would be in the warden's garden, with access to it from cloisters or through *non-licet* gate. The proposals were submitted to the governing body. It was then officially announced that, while appreciating the generous intentions of the committee, yet in view of the great divergence of opinion among Wykehamists as to the proposals for the rearrangement and refitting of the present chapel, and the erection of a new chapel, the governing body were unable to give their consent to any of the plans submitted by the committee. The two schemes are, therefore, rejected, and there is a risk that a rare occasion for displaying affection for the old college in a substantial form will not be utilised.

THE Commission of the Municipal Council of Paris have considered the proposed sites for the international exhibition of 1900. Eleven members—that is a majority—have voted for the selection of the Champ de Mars, while there were only five members in favour of a site in the Bois de Boulogne. The decision has given much satisfaction in Paris. At first some people for their own interests tried to make out that particular places which could be secured on easy terms were especially advantageous for a universal exhibition, but it was not long before the motives of the recommendations were seen through. Eventually it was discovered that there were only three places belonging to the public which were worth serious consideration, viz. Vincennes, the Bois de Boulogne and the Champ de Mars. Vincennes was found to be better adapted for fêtes and other spectacles than for several buildings. The character of the Bois de Boulogne it would be risky to alter, and, moreover, a large proportion of visitors would be dependent on the moderation of the owners of voitures to reach the buildings. As already Parisians have had experience of what companies and drivers can exact, they would be too sanguine to expect that reasonable fares would be sought in 1900. There remained the Champ de Mars. It may be taken for granted that the buildings which the late M. ALPHAND prized so dearly will have to be removed by one fell stroke. Novelty is indispensable in the appearance of an international exhibition, and as Parisians have little regard for the past, they are not likely to sacrifice a costly undertaking for the sake of buildings that have already served the purpose for which they were designed.

THE Committee of the British Columbia Protestant Orphans' Home have invited designs from the architects of Victoria for an orphanage to accommodate 100 children. The limit of cost is 20,000 dols., and premiums of 100 dols. and 50 dols. are offered to the authors of the designs placed second and third. An assessor is to be employed. The instructions issued to competitors comprise a report and sketch plan, prepared for the committee by Mr. R. OWEN ALLSOP. Designs will not bear names, or mottoes but are to be numbered as they are received.

H. TAINÉ'S THEORY OF ART.

THE death of a writer whose books were as well known to foreigners as to his countrymen is necessarily a loss to France, but it is more than literary skill that has passed away with HIPPOLYTE ADOLPHE TAINÉ on Sunday morning. As a *littérateur* he was not esteemed like ERNEST RENAN. With all his shortcomings, RENAN was almost loved; his failings were accepted as the inevitable consequences of his Gallic nature. His countrymen were aware that, like him, they were logical and illogical at the same time, ready to sacrifice their happiness to ideas that brought misery, and, as it were, to make themselves the slaves of words. RENAN could one day show himself as reverential as any of the peasants of his native district, and next day could mock what he had adored. But his manner of expressing his thoughts was enough to captivate all who were offended by them. It might be supposed from the way he was treated by opponents that they believed he was not entirely wicked, and was mainly anxious to display his skill as a writer by treating subjects that were generally considered to be outside the *belles lettres*. He was, as it were, a conjurer who in graceful curves could toss about things which wounded hands that were less dexterous. The game was dangerous, but he was saved by finesse. Then again, RENAN belonged to the old school of writers that, spider like, were supposed to derive their works from themselves. He wrote about what he felt and what he saw. As became a Frenchman, he was assured that he represented the race that was the utmost development of nature. Destiny had placed all other beings at a lower level. It was not surprising that he should advise humanitarians to adopt the most philosophic and most effectual remedy for earthly ills, which was to teach all nations to laugh like Frenchmen. No doubt in so writing RENAN had given way to Chauvinism, but still, he was asserting the independence of the individual, the right to act according to the whim of the moment, and a sort of defiance of fate.

M. TAINÉ might be considered as following a very different sort of course in his teaching. By race he was thoroughly French, for he belonged to the Ardennes, but he was unable to persuade himself that his countrymen were not inferior to the English and the Germans. According to TAINÉ the four caryatids of humanity were SHAKESPEARE, DANTE, MICHEL ANGELO and BEETHOVEN. France was therefore supported instead of supporting. It must not be imagined that his manner of assessing the value of his countrymen in relation to humanity was the consequence of some slight he had received or of "a fit of the blues." At the beginning of his career, in the thesis ("Essai sur les Fables de La Fontaine") which he submitted when he sought his degree of doctor of the Sorbonne, we find that he judged French literature from an exalted standpoint and found it imperfect. DE MUSSET, who was supposed to express the feelings of the most refined part of his countrymen, was declared to be "un tapageur," whilst VICTOR HUGO, who was then held to be more sublime than MILTON, was described as "un épileptique." M. TAINÉ recognised a genuine Gallic type of writer in LA FONTAINE and to some extent in RABELAIS, MOLIÈRE and VOLTAIRE; but taking French literature as a whole, it appeared to him as a rehash of German thoughts with those of Greeks and Romans, or, to express it in another way, a variation of foreign airs. It says much for TAINÉ's courage that he ventured to show such impartiality at the most critical time in his career, but more credit is due to the people who could honour and reward so severe a censor. From his early conclusions he never retracted, and there are no books which are better adapted to humble French vanity than those which came from M. TAINÉ's hand. His masterpiece is undoubtedly the "Histoire de la littérature anglaise."

It is not our business, however, to deal with literary questions. We refer to this subject in order to make TAINÉ's standpoint more clear. A writer like RENAN, who keeps on common ground, can hardly fail to aggrandise the things which have interest for himself and the men around him. Such views sometimes become parochial, cockney, or of "the Parisians of Paris," who believe there is nothing civilised beyond a section of the boulevard.

Perhaps it would be more exact to say it is the unscientific view. Now, TAINÉ was of a scientific turn. We do not mean that he was strong in any branch of physics, or that he was competent to write an authoritative treatise on economics. But he attained the scientist's idea of force, and he recognised that it was not in any way limited by the boundaries of states, nor acted only in times which men accept as the political eras. To a French geologist the phenomena in Wales, Antrim, the Hartz Mountains or the Sandwich Islands are as interesting as any to be seen in Auvergne or the quarries round Paris, and there can be no doubt that M. TAINÉ showed a similar impartiality in treating of art and literature. However closely he might look at things, he did not esteem them as if they were unique. Thinking of humanity as a whole, is it a wonder that he sometimes failed to take men at their own or their admirers' valuations? This catholicity of judgment is suggested in one of M. TAINÉ's early lectures at the Ecole des Beaux-Arts. When speaking of the modern method, which was his own, he said:—"It has sympathies for all the forms of art and all the schools, even for those which seem to be the most opposed; it accepts them as so many manifestations of the human spirit; it considers that the more they are numerous and contrary, the better they exhibit that spirit by numerous and contrary sides."

But there was supposed to be one drawback attending his mode of study. It was said to have a tendency to dwarf individual powers. We read much in CARLYLE, as in his German teachers, about the influence of "environments." In TAINÉ the environments are factors of greater importance. In the same way as an agriculturist might demonstrate the relations between the qualities of any sort of crops and the position, subsoil, surroundings, atmosphere, drainage, &c., of the ground whence they came, TAINÉ maintained that to judge not only an artist or a poet, but every man of talent, we must not begin with investigating him: the preferable course is to start with the analysis of the living and lifeless things about him, and after the process the mystery of his life becomes revealed. Science is mainly concerned with the impersonal, or, as the French doctor said, soul is not comprised in a diagnosis, and M. TAINÉ endeavours to eliminate individuality or any other element that will disturb his process. He found that many of the seeds cast into the earth did not germinate when the conditions were not favourable to growth. There was a corresponding state of things affecting art. A peculiar moral temperature, he said, was necessary for certain sorts of talent; if it did not exist the talents died, if it varied the talents varied, and he went so far as to suppose that the moral temperature might even make a choice between the different species of talents, allowing some to develop while others were excluded from its influence. Physical temperature was not of more importance in respect of plants than was the influence of the time or the "température morale" on mental growth, and by considering its peculiarities we could understand the phenomena at one period of pagan sculpture, at another of realistic painting, mystical architecture or classic literature, voluptuous music or idealist poetry. Everything was to be explained by the environment: "les productions de l'esprit humain, comme celles de la nature vivante, ne s'expliquent que par leur milieu."

This theory will explain one of the characteristics of M. TAINÉ's writings on art and especially on painting. He describes at great length events which took place in Italy, but of a kind that VASARI would not introduce in his biographies—festivals at courts, public celebrations, the eagerness of collectors to secure examples of ancient art, or of courtiers to obtain beautiful stuffs, the interest excited by new poems, the appearance of strangers in cities and so on. In the same way he shows the influence of the events in the Low Countries on the painters. To paint the portrait of an individual M. TAINÉ likes to have an immense canvas, which he crowds with figures. He does not make them form only a background. He loves animation and colour, and has undoubted talent in producing dramatic scenes. He therefore puts all his force into that part of his work. If the subject of the portrait accordingly appears insignificant somewhere in a corner, that does not move M. TAINÉ. Individuals are rarely grandiose, and by what law should they be made more

prominent than better men? Thus, when he has to represent ROBERT BURNS to Frenchmen we see the new inventions, the increased exports of the eighteenth century, the French Revolution and its heroes, the battle of Talavera, the philosophers of Athens, Rome and Alexandria, ALEXANDER THE GREAT, DESCARTES, LOCKE, GOETHE and his "Faust," and the German poets, so that the fiery-eyed and amorous Scotsman, when we at last discern him appears to be a commonplace person who has gained reputation under false pretences. We have no right to quarrel with artists of originality. Why should not M. TAINE be allowed to display his power in surrounding a subject with diverse figures when the old portrait-painters might enclose the heads in floral wreaths or introduce imaginary battles and mythological scenes in their backgrounds? M. TAINE's own practice is an exemplification of his theory. As the artist is only an *enfant de siècle*, a child of the time, it seems appropriate that his inferiority should be suggested by suggesting his inferiority to something that is greater than himself.

It is needless to say that M. TAINE's theory is not novel. In one of his early articles MACAULAY takes great pains to prove by numerous instances how "it is the age that forms the man, not the man that forms the age," and how "great minds do indeed react on the society which has made them what they are, but they only pay with interest what they have received." In France the theory was held by MONTESQUIEU and others. But M. TAINE has worked it out more elaborately and rigorously than any of his predecessors, and especially in its application to art and literature.

It may even be said that he gave to theory a significance which was novel. In the accounts which have appeared in the journals this week, and which describe M. TAINE's training, there is no mention of the influence which had more to do with his way of thinking than any other. If he differed from the majority of students who passed through the Collège Bourbon and the Ecole Normale, it was owing to the revelations of life which he obtained when he shared the young physician's garret, where the furniture consisted of a bed, two chairs, a wardrobe and a skeleton. There he studied with most success, and there obtained some glimpses of those arcana which are not unveiled for ordinary students of literature. TAINE had not SAINTE-BEUVE's physiological experience, for he was not a hospital pupil, but he was more able to turn the little he knew to account. Numerous as have been the comparisons between a Gothic church and other objects, who before TAINE ever thought of describing it as the adornment of a nervous and over-excited woman, the expression of a crisis? His precept to the students of the Ecole des Beaux-Arts about the necessity of possessing genius, which was, however, "l'affaire de vos parents, ce n'est pas la mienne," and his advice "pour fabriquer de belles races," and many other passages, suggest he was as vain of his physiology as MICHEL ANGELO was of anatomical knowledge. As a psychologist he depended on material evidence, the soul and the deity were alike disregarded. His assumption that all people with a musical turn were disposed towards Protestantism, whilst Catholicity attracted all who favoured the plastic arts, also seems to be derived from something he heard from a physician about the wide relations of undisciplined emotions.

It is allowable to apply TAINE's theory to himself, and to say that he simply expressed the tendencies of our time. Whatever the origin of his theory, it is not difficult to see its effects. As every age has a character of its own, it follows that arts and artists must correspond with the respective transformations. There cannot on that ground be any fixed standard of art, and moreover, according to TAINE, all varieties of art, however opposed they may be to each other, are alike interesting when tested by a rational system of æsthetics. It might be going too far if we asserted that Impressionism and other novel modes of expressing form were inspired by M. TAINE's teaching, but there is no doubt his lectures and writings are an apology for them.

As he did not advocate a fixed standard in art nobody will be anxious to obtain a professor of æsthetics to fill the chair at the Ecole des Beaux-Arts who will expound M. TAINE's doctrines. His successor may be a man who will believe that artists should always have Greek works before their mental vision, or, like REYNOLDS, will introduce the practice of MICHEL ANGELO on every

occasion that may arise, or will idolise one of the ancient masters of France. In any case we must expect only a partial, a one-sided explanation of æsthetics. TAINE's system (if it deserves that name) at first sight appears to be freedom from respected precedents, a sort of go-as-you-please practice. It approves of license, but it deprives the artist of the privilege to feel that he is expressing his own thoughts, for he becomes only a sort of instrument which is employed to express the feelings of the crowd. M. TAINE, it appears to us, in his reasoning has confounded the patron with the artist. We may grant that in different ages there may be demands for different classes of work; one time battle-pieces will be in favour, or drinking scenes, or sporting subjects, or sculpture pieces, or *genre*. Architecture also has its favoured species. Necessity may compel artists to carry out the class of work that is the vogue, but it does not follow that such examples are always to be accepted as those which the artists would consider as worthy of their powers. If BARRY were judged by his Houses of Parliament alone and SCOTT by his Foreign Office, would the estimate of their ability be exact? In all times we fancy the same state of affairs prevailed, and although theorists may see in the examples the tendency of the spirit of the age, it would be erroneous to believe they exemplify the spirit of the artists. In that way, at least, M. TAINE's theory fails. Under certain conditions it may be exact, but it is not adapted for a general rule. It may serve for mediocre artists, it does not fit those men who are accepted as guides by their contemporaries and posterity.

It would be difficult to evolve a theory which is more gratifying to the public. They may lay the flattering unction to their souls that they are joint producers of the art and literature of their time. It is to be hoped they are prepared to show their satisfaction by a generous outlay to secure the treasures they have inspired. If so, M. TAINE's memory will long be green. In England we have reason to regret the loss of a man who spared no trouble to convince his countrymen of the value of English literature and the freedom, cultivation and happiness of the life it depicts.

THE STUDY AND PRACTICE OF ART.

AN address was delivered by Mr. Walter Crane on Saturday to the students of the Municipal School of Art and the Technical School, Manchester, of which the *Manchester Guardian* gives the following report:—Mr. Crane, who was cordially received, said that various views of an artist's life and motives for following art were apt to present themselves to those on the threshold of the vast field of its study. They either looked upon it as a thing to be pursued for the pure love of the thing, for the extreme delight and fascination which the pursuit of such a wonderful thing exercised upon them, or they were attracted to it because it was a very pleasant means of getting a livelihood. Perhaps, also, they regarded it as an amusement, a pastime or an accomplishment, but this third reason might perhaps be dropped altogether as of no account, since art could not be studied to any purpose except in a serious spirit. In practice it generally came about that the first two had to be reconciled in some way, and it became a pressing question sooner or later as to how to do so. It was always well to remember that there was no natural connection between love and money in the arts, and indeed, it would be better if all work could be inspired by and done for love. At the same time, under present economic arrangements, the labourer was at least worthy of his hire. To paint great masterpieces and make fame and fortune was an ambition given to few to realise. The masterpiece, at all events, must be a labour of love, whether fame or fortune followed or not. Good art, like virtue, was its own reward, but just as virtue required appropriate conditions for its development, so the artist required support and sympathy. The potentiality for art existed in a rudimentary way, though in very varying degrees, in perhaps all individuals, but as a general rule skill and facility were only acquired at the price of constant devotion—a devotion spontaneous and sincere. Even great gifts of natural or inherited adaptability required to be strengthened and made supple by study and constant practice and observation. Where from the earliest the student had been surrounded by the tools and implements of art, when he had seen it progressing before his eyes, the gain was enormous over those who took up their studies late, and to whom the world of art was comparatively mysterious and strange. The mere imitative impulse which appeared to be possessed in common by all mankind in a little degree would, in the first instance,

gain a certain ease and facility of hand in dealing with tools, which itself was a very great advantage to begin with. In fact the first consideration in studying art was facility of hand. Without it really nothing could be done, since the power of expression was so much dependent upon it. Facility of hand could clearly be developed by exercise, just as muscular strength could be. From simple exercises a student might advance, and those who developed more faculty or taste in certain directions rather than others might pursue further those particular branches, making them main studies to which other side studies would contribute. The use of colour and the habit of working directly on the paper with the brush would, again, give enormous facility and precision of touch, of great value to the designer of patterns, and also to the pictorial artist. Method was a question of habit, and in many departments of design precision of touch and directness of execution were of the greatest importance. It was this quality of precision and technical adaptability to the conditions of manufacture which had, he believed, induced many manufacturers to seek their designs and working drawings on the Continent. From the specimens he had seen, however, he could not say that he was impressed with the originality and fertility of the designs. Yet after all we must concede that morally our French or German brother had as much right to life as we had. Competitive commerce certainly was no respecter of nationality. We must all take our chance in the world's market nowadays. We were all chained to the conqueror's car. We needed a new Petrarch to write the triumph of commercialism, and a new designer to picture it. He was afraid the modern triumph, such as it was, was pictured for us in the rampant poster, which pursued us in and out of stations, up and down streets, and even along our railway lines. He did not say the poster had no place in art. Under considerable restraint and chastening it might be possible to make the announcement of useful wares and theatrical events at least inoffensive, and it might be that the mere working of competition would produce a demand for more refined productions. But let us keep it out of our scenery. Anyway the subject was important, since our hoardings were evidently the most obvious public educators in pictorial and typographical design. It was, after all, what met our eyes every day that influenced us. It was the surrounding, the set scene of everyday life, that affected our artistic sense more than anything. While a visit to a museum or art gallery was only an occasional matter, except for students, the mass of mankind must take their impressions of colour and form from what they saw around them. It was, as they knew, the persistence and aggregation of small causes that had played the chief part in the moulding of the earth as we saw it, and which were continually changing its aspect. In like manner the general sense or sensitiveness to beauty was acted upon unconsciously, he had no doubt, by the aspects of everyday life, by the colours and forms of the street as well as by the pictures and furniture of our domestic interiors. If this theory were correct, it followed that anything which impaired that sensitiveness must injure the faculty of its appreciation and production. We had been too careless in this matter, and constant toleration and familiarity with hideous surroundings tantalisied and blunted the perceptions. Manchester had had so many æsthetic stones thrown at her lately that he would not specially dwell upon her artistic aspects, but, seeing how largely ugliness of form and colour prevailed in at least the externals of modern life, especially of our manufacturing centres, it was perhaps not surprising that a certain cult, a certain worship of the ugly, should have obtained a footing even in art. He did not deny that there were certain tragic aspects of industrialism, a certain weird fascination, in drifting clouds of smoke and beauty in the forms of escaping steam, and that graphic representations of the various restless aspects of modern life had, in proportion to their sincerity, historic value. It was, at all events, our life, and must be recorded, though it lent itself to the art of the newspaper. But a great deal of clever art could be put into a newspaper. Our newspapers were perhaps getting the better of us. Like Chronos, the press devoured its own children, and no one knew how many geniuses were yearly swallowed up or how many lives and talents were consumed in order that the comfortable world should have its dish of news and views at the breakfast-table. Art might be said to be divided into the pictorial, the creative and the pot-boiling kinds. The first two were governed by their own laws and the individual preferences of the artist; the third depended upon the state of the market, averages and the laws of supply and demand. It seemed quite possible in an artistic life, while preserving an ideal of beauty of design and workmanship in whatever direction, without sacrifice of principle, to remain in touch with the ordinary wants of humanity, to realise that that art was not necessarily the highest which was always in the clouds, but indeed that all kinds of art gained in character and beauty in proportion as the ideas they expressed were inseparable from the materials in which they were embodied. Sincerity was the fundamental condition of good design and workmanship, which never prided themselves on imitating qualities which properly

belonged to other forms of art and other materials. There were two systems or methods of education in art, the academic and the experimental, or relative and adaptive. The one treated art or design in the abstract, on certain cut-and-dried principles and methods, passing every mind through the same mill, without special reference to any particular conditions of craftsmanship or individual preferences. The other taught design in concrete forms, and in direct relation to tools, methods and materials, with the object of calling out the individual feeling and setting it free to express itself under the natural limitations of art in its own way. The latter, he supposed, was intended to be the method of the new technical schools, so that a student might really acquire a practical working knowledge of the peculiar requirements of design to be reproduced in any process of manufacture, instead of being launched on the world with vague general ideas of drawing and painting, but ignorant of how to apply them. It, of course, remained to be proved how far technical schools could really efficiently take the place of the old workshop training under the apprenticeship system, which led to good results in the past; but while one must recognise that changed times required new methods, it ought also to be clearly realised that efficiency in the use of tools and materials and adaptability to materials, with the view of bearing on the prosperity of trade and supplying manufacturers with more highly-skilled designers and workmen, went to form one aim and ultimate object. On the other hand, was the like efficiency governed by the fresh creative impulse of artists and craftsmen taking keen pleasure in their work, with leisure for reflection and enjoyment, and the gathering of fresh ideas from no poor, mean or stinted life, deprived of the stimulating influences of natural or architectural beauty or the touch of refinement, with the stimulating emulation and co-operation of fellowship instead of cut-throat competition. These were two ideals, somewhat distinct. It remained to be seen which goal we should ultimately reach. At present the requirements of artistic ideals were not always identical with the demands of commerce, and sometimes not so in any sense at all. It therefore became a question for the individual artist how far he could, without casting away or losing sight of his higher ideals and aspirations, associate himself with work of a less ambitious, more immediately serviceable, but not necessarily less artistic kind. It was here that technical knowledge would come in to help him, and there was room for the very best talents and invention in design in the work of the loom and the printing press, iron, wood, stone, metal, glass, in a thousand materials and forms which contributed to build up the life of ordinary civilised man. When the design and construction of our furniture and the various patterns and accessories which ministered to the daily wants of humanity fell into purely mechanical hands, and artistic craftsmen no longer concerned themselves with the unity of use and beauty, the sense of beauty and pleasure in life which came of the exercise of the artistic faculty and of its appreciation, both were in a fair way to perish of inanition. As in the pursuit of art we advanced in the possession and interpretation of beauty and in the power of conferring higher pleasure to the cultivated senses and intellect, so were the forms of art apt to be placed higher in the scale. But high art could only mean the art which embodied the highest beauty and conveyed the most lasting and ennobling pleasure. It was its quality more than its particular form which settled this. Sharp lines of demarcation were often drawn between fine art and decorative or industrial art which had proved very misleading. A good design was better than a bad picture any day. But the arts were really an equal brotherhood. Excellence in any one branch probably required as fine capacities as excellence in another. Beauty was of different kinds, but perfect beauty of design and workmanship must be acknowledged to be so after its kind whenever it was met with; and who was to hold the scales between one kind of beauty and another? If an exquisite work of the loom satisfied the eye with lovely and subtle harmonies of colour, with delicate, beautiful and inventive design, and even suggestions of romance and poetry, could the finest work of the painter give more? Were threads and dyes necessarily inferior to colours and palettes, or the loom less a work of ingenious joinery than the easel? Whatever might be the official and scientific classification of the arts agreed on, there was but one spirit in which to study and practise in any or all of them—sincerity in love of beauty. Artistic feeling was shown often as much in the judgment which restrained or forbade ornament as in the fertility of invention from which it sprang. Organic consistency, adaptation to purpose, harmony and relation to surroundings were qualities at least as important as ornament. Yet it seemed often to be thought that decorative art meant ornamenting something, while the very word decoration must mean something appropriate, fitting, perfectly adapted. If the sense of beauty was really a living and effective force we should consider it a crime to destroy natural or architectural beauty, or to take away the public possession or enjoyment of it by any means, and should insist that the problem of utility was but half solved unless the result was harmonious. At present the world

seemed too busy about other matters—dissecting and analysing, buying and selling, experimenting, manufacturing and speculating—to care collectively for beauty perhaps; and truth was at present too many-sided and composite to be easily reconciled with beauty. All was tumult and conflict, and through the smoke and dust of the commercial competitive battle in which we spent our lives we were not quite sure when the sun was shining, and when we were sure were perhaps too busy making the proverbial hay to notice the beauty of it. That was only for artists and idlers, and the world had such a horror of idleness that people not condemned to hard labour had acquired a habit of being extraordinarily busy about nothing in particular. It was supposed to be a conclusive argument against Socialism to ask, "What will you do with the idle?" which seemed a little like raising an objection to eating one's dinner because one did not know what one would do when one was not hungry. Artistic ability and power of design were often talked of as if they were in the nature of conjuring tricks, and their exponents, like those automatic machines in the stations, which only required a penny in the slot to satisfy every ordinary modern human requirement. It was not sufficiently realised that the sense of art and the power of its creation was a growth of the mind which must have its processes of germination and fruition. Art was not nature. It was a commentary or creative variation upon it, but in the progress of its own development art followed natural laws. Truth and beauty were true lovers, but the course of true love never did run smooth. While truth in various disguises was roaming desert places, sometimes like a knight errant fighting with sphinxes and dragons, sometimes, like Thor with his hammer, striking blows the effects of which were only seen long afterwards, beauty, like an enchanted princess, was often shut up in gloomy castles, closed round with thorny woods or thronging factory chimneys. It was their business to re-discover her, to awaken her, to interpret her afresh to the world, and to show that if beauty slept our senses were only half awake and our lives a meaningless monotony.

The Mayor of Manchester proposed a vote of thanks to Mr. Crane for his address. This was seconded by Dr. Ward and carried with acclamation.

BUDDHIST ART.

A LECTURE on "The Buddhist Art of Ancient India" was given by Mr. J. Kennedy at the Midland Institute, Birmingham, on Monday. The Buddhist period in India, it was said, extended over twelve centuries, and to that period all the earliest monuments of Indian art belonged, and, with very few exceptions, all these monuments were dedicated to the service of the Buddhist religion. The monuments themselves extended over a period of nearly ten centuries, from the time of the Indian king, Asoka, about 250 B.C., to the end of the seventh century of our era. Buddhist art formed the foundation of Burmese, Chinese and Japanese architecture. There were, however, two reasons, altogether apart from historical reasons, why we should interest ourselves in Buddhist art. First of all, it demonstrated the popular side of Buddhism; and, secondly, because it enabled us to trace the growth of an architecture purely indigenous, which began from the simplest elements, and evolved itself into a highly finished art. Originally the Indians used wood and brick alone for their buildings, and stone was employed only for the foundations. The first impulse to Buddhist stone architecture and sculpture came from Persia, and the Assyrian system of sculpture also came into India through Persia. A much greater impulse came from the time of the brilliant reign of Alexander, 327 B.C. Dealing with the historical and philosophical basis of Buddhist art, the lecturer showed how Buddhism, though apparently unpropitious to the development of any art, did produce the finest art that India had ever seen. It was in the monasteries, meeting-halls, temples and residences of the Buddhist monks that this art was developed. Buddha, though belonging to the materialist school of philosophers, advised the people to continue their ancient worship. An important part of this worship was that paid to the dead and the erection of tumuli to their memory. The lecturer showed by the means of some very fine lantern views how these tumuli developed into large circular domes of brick with processional walks round them, and the daghoba, or sepulchre, in the centre. The outer enclosure was built of stone, but the structural forms were all of timber, and so, too, was the elaborate ornamentation of the gateways. The first idea of Buddha himself as an object of worship came from the Greeks, who had settled in Northern India, one of their coins, of which a picture was shown, affording the earliest example of a representation of Buddha. Gradually the multiplication of images of Buddha came to be regarded as meritorious, and the architectural ornamentation of the stupas or topes gave way to sculpture of the most elaborate character. The daghoba, too, gradually became a shrine, and eventually the image of Buddha took its place. The lecturer traced in a similar manner the gradual development of the rock

monasteries, temples and halls of meeting into magnificent examples of architecture, and showed how the style naturally grew from that appropriate to timber into one more suited to stone. The temples were also adorned with frescoes, which in power of drawing and force of expression far exceeded anything that could be found in Europe at the same period, the fifth and sixth centuries of the Christian era. Some of the Buddhist shrines, he pointed out, bore a remarkable resemblance to the Byzantine works of a later period, or to the work which in Europe was called Mediæval.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

A CONVERSAZIONE of this Society was lately held at Drapers' Hall, Throgmorton Street, by permission of the Drapers' Company. Dr. Edwin Freshfield presided, and read a paper "On an Early Book of Accounts of the Churchwardens of All Hallows on the Wall" (exhibited by the Rev. S. J. Stone, M.A., rector), also some remarks upon "The Fruyte of Redempcyon," by Symon the Anker, of London Wall, printed by Wynkyn de Worde, in 1514. Dr. E. Freshfield commenced by exhibiting to the meeting a drawing of the old church of All Hallows on the Wall. He then briefly described the former church, which escaped the Great Fire, and which he said should have been preserved; it would have been an interesting feature in London, but the demon of destruction was as much alive in the eighteenth century as it is now, and the consequence was that among other objects of Mediæval interest whose loss they had to deplore was the old church of All Hallows. It was the only church which actually abutted on the Wall, and the semicircular chamber which now formed the vestry was built inside one of the round projections of the Wall. The parish in early times was about one of the very worst parts of the City. Outside was Finsbury Moor, a receptacle for all sorts of horrors. The lowest and worst part of the population and the most degraded used to reside in this parish, and the proceedings in Guildhall testified generally to the want of respectability. The account book was one of extreme interest, and he had no doubt that when it was printed, as it would be, in the "Transactions" of their Society, it would be read with extreme pleasure. He then gave several quotations from the book, and next referred to "The Fruyte of Redempcyon," and said that the author, "Symon the Anker," was an anchorite of London Wall. The book itself was in too tender a condition to permit of its being exhibited, but it had been transcribed, and it would also be printed in the records of the Society. The Rev. J. A. L. Airey, M.A., rector, next made some observations on the recent restoration of the church of St. Helen's, Bishopsgate. He said he was not an expert in archæology, but the work which had been done here was of more than ordinary interest. It had been the habit of late to condemn restorations generally, but theirs had been one of necessity. When he was first presented to the united benefices of St. Helen's and St. Martin Outwich, he was astonished at the disgraceful condition in which he found the church. He and the churchwardens, who seconded him, obtained the necessary permission to have the church thoroughly restored. The miserable substitute for the heating apparatus, with the coal-hole and dustbin, he found in one of the corners of the sacred edifice. The vestry-room was a mere box and the ancient roof was hidden out of sight. The plaster on the walls was hanging in shreds, and the damp throughout was eating everything away. The registers in the safe were coated with thick mildew, and it was almost impossible to make out the entries. In fact, to use the words of a friend, the whole place looked like "The church in rags!" In January, 1891, the Charity Commissioners granted them 3,000*l.*; the Merchant Taylors' Company, the patrons of the living, supplemented that with a grant of 3,500*l.*; while the Leathersellers', the Grocers', the Skinners' and the Drapers' Companies had all subscribed and assisted both in money and in kind. The work was now approaching completion, but a great deal had yet to be done. Everything of an antiquarian interest had been preserved, and the disfigurements of recent times had been effaced. The flooring had been raised at some time or other; there were a large number of human bones found immediately below the floor. The church was now in a thoroughly sanitary condition, the bones having been removed in 200 leaden coffins to Ilford, and he was pleased to announce that the Bishop of London would reopen the church on Saturday, June 24 next.

Mr. Charles Welch, F.S.A., hon. secretary, then described a very curious wall-painting representing Jonah being cast into the sea, and which was exhibited to the meeting. This wall-painting had been discovered last autumn during the demolition of five small old houses on the south side of High Bridge Street, Waltham Abbey. A water-colour drawing of these houses with their gable fronts was shown to the meeting, showing the Abbey a short distance off. All traces of the

buildings had disappeared when the painting came under Mr. Welch's notice, but it had been admirably preserved, and in his opinion it was of the sixteenth century.

Mr. J. G. Waller and another gentleman also addressed the meeting, and concurred that the date of the painting in question was of the sixteenth century or about the reign of King Edward VI.

The Rev. Prebendary Whittington described the communion-plate of St. Peter's Church, Cornhill. Two of the large silver-gilt cups were very curious and "were given by Thomas Symonds" (with their patens) in the year 1625, at least so it was stated on them, but Mr. Cripps (an authority on these subjects) said this was not so; one of them was the real old original cup of the reign of Edward VI., and no doubt made out of a still earlier pre-Reformation chalice in accordance with Puritan notions, and in compliance with episcopal visitation articles. Very few of such cups were left; there was one, however, at St. Lawrence, Jewry. The cup at St. Peter's was of the year 1549, while the fellow one was of the year 1625, and so were both the patens. The second cup had been made to match the old original parochial cup, and somehow the donor's name had been put upon both. The two tall flagons were also of the year 1625, and were the gift of Alderman Westrowe.

Major Joseph, C.C., described the plate of the parish of St. Antholin, Watling Street, and exhibited a list of forty-seven donors who subscribed for the reseating of the church just after the Great Fire of London. This parish is now united to St. Mary Aldermanbury, Queen Victoria Street. Among the plate was exhibited a fine alms-dish of the year 1685, "the gift of Elizabeth Fudick, maid-servant of the parish of St. Antholin's, for the use of the communion-table."

Mr. St. John Hope briefly described some of the Roman and other articles in the exhibition; these consisted of a very large collection of antiquities discovered during the past seven years within and around the City of London and collected by Mr. James Smith. The meeting then dispersed to view this handsome collection in the spacious court-room.

Among the articles exhibited was a good collection of Roman and other coins, many of them of the Plantagenet and Tudor periods, and some of them of the reigns of Elizabeth, the Charleses and James II. There was also a number of tradesmen's and abbey tokens. There were some Roman amphoræ (which had been discovered in London Wall); flint celts and Celtic pottery, bronze pins and Roman buffware. Among the Roman lamps was one found in Moorgate Street, in an admirable state of preservation. There were also keys, knives, horseshoes, &c., of various periods, and a collection of smoking pipes. Among the pottery of the seventeenth century was a jug with a quaint motto:—"Fast and pray, pitty the poor; Amend thy life and senne no mor. 1656." There was also some Roman leather work, one specimen being a child's sandal, with the lace still attached to it. It was stated that the Corporation contemplated purchasing this collection for the Guildhall Museum.

TESSERÆ.

The Marseilles Warehouses.

THE bonded warehouses, or "entrepôt commercial," for the port of Marseilles form one block of buildings. Two lines of railway, and a public thoroughfare which runs parallel to it, separate these buildings from the Dock du Lazaret. On the east side are sidings from the Paris, Lyons and Mediterranean Railway, a junction with this line having been made by means of an incline and a tunnel under the town. The length of these warehouses is 365 mètres (1,200 feet), with a breadth of 37·5 mètres, and a height of 35·7 mètres. The offices are of the same breadth, with a length of 37·6 mètres. The warehouses are divided into four quarters, each containing an interior court with two doorways. There are six storeys above the ground-floor, with vaults below, the whole having been constructed in stone and iron, the concession requiring that all the materials should be fireproof. The masonry is, for the most part, a better class of irregular rubble; but the piers, arches, quoins, windows and ornamental work are of dressed ashlar. The cost of the several kinds of masonry and brickwork per cubic metre was, hard limestone dressed and built in place, 4*l.*; less hard quality, 3*l.* 4*s.*; soft calcareous stone from Miramas, 2*l.* 2*s.*; rubble, 12*s.* 6*d.*; and brickwork, whether of solid or of hollow bricks, 2*l.* 8*s.* per cubic metre. The thickness of the walls is 1·25 metre at the foundations, 1·08 metre at the ground-floor, and diminished gradually to 0·58 metre at the sixth story. The ground-floor is supported by massive stone pillars and vaulting, while the other floors rest on cast-iron columns. All these warehouses were constructed without the aid of scaffolding, by means of three travelling cranes, two on one side and one on the other, of the buildings. These cranes consisted simply of a jib, 28 mètres in length, suspended a little below its centre; the extreme load lifted at one time was 2½ tons, and per day, by each crane, 150 tons. There were 14,136 cubic mètres of masonry in these warehouses, and it had cost 3,000,000 francs

(120,000*l.*) exclusive of the foundations; the latter having cost 203,000 francs. All the doors and window-frames are of wrought-iron, 30*l.* per ton having been paid for the former, or in all, for the doors alone, 4,800*l.* The floors for each storey are composed of wrought-iron double T girders ½ a metre in depth, 4·53 mètres in length, and weighing 145 kilos per metre. These rest on cast-iron hollow columns varying in section at each storey, according to the load. The junction of two columns with the wrought-iron girders was made in such a way as to allow of the expansion of the girders taking place. One column simply rests on the top of the other, the two ends being turned in a lathe, while the girders rest on the lower flanges of the upper column, the attachment being by bolts. The columns were all cast vertical, are 4 mètres in height, and were tested to support a vertical load equal to 8 kilos per millimètre of section. The wrought-iron girders were subjected to a tensional force equal to 12 kilos per millimètre of section. The vaulting between the girders is built of hollow bricks 6 inches deep. The floors were all constructed to carry 2 tons per square metre. The girders of the roof are composed of two angle irons at the top and two at the bottom of the section, separated by strips of flat iron, forming a sort of lattice web. The girders are free to move in the direction of their length, resting simply on a cast-iron shoe embedded in the wall. They are 4 mètres apart from centre to centre, and were separated at the crown by similar girders. The tiles were supported by iron of an A section, 8 centimètres in depth, and galvanised. It was calculated that this roof would sustain 4 cwt. per square metre. The vaulting between the girders was of hollow bricks, similar to those used for the floors, but much lighter. The vaulting cost, including all expenses, 6*s.* 8*d.* per square metre. The quantity of cast and wrought-iron was 340 tons, and its mean cost had been 24*l.* per ton. The total cost of these bonded warehouses, comprising machinery, hydraulic pipes, &c., had been half a million of pounds sterling.

Adaptation of Figures to Limited Spaces.

One of the greatest difficulties in architectonic decoration is to include the whole of a design within the boundaries of the space allotted for it, so that the figures are not maimed by losing parts of their limbs, or, by passing unseen beyond those boundaries, made to appear as if they were independent of the building of which, as decorations, they form essential parts, and whose functions their subjects are intended to illustrate. Not only is the law which requires this difficulty to be overcome strictly logical and consistent—as the laws of art ever are—with the plainest common sense, but it is illustrated by the practice of the Greeks, by the great architectonic sculptors of the Middle Ages, and by Michel Angelo himself—e.g. for the first, let the student look at the compositions of statues which filled the pediments of the Parthenon, and he will find that not a figure was maimed, not a limb was missing. What should we say if the slope of the gable of the eastern pediment had carried off the head of the Theseus? or if Hyperion, where he rises, with outstretched arms, guiding those mighty, golden-maned horses, as they breast the morning sea, had not found room to ascend upon his course? Did not the chariot of Night fill, in a similar manner, the opposite angle of this pediment? Do not the glorious statues of Ceres and Proserpine, even in the positions of their arms, harmonise perfectly with the lines of the architecture of which they formed parts? Is not this the case on the opposite side of the composition with regard to the recumbent Fates? In the western pediment of the Parthenon the same rule obtained, and the figures of the river deities, Cephissus (Ilissus) and Callirrhoe, not only indicated the territorial limits of the theme illustrated by the design as a whole (it was the contest of Athene with Poseidon for the glory of naming Athens) as bounded by those streams, but aptly filled the lower angles of the gable. In the friezes and in the metopes, not only of the Parthenon, but in the Temples at Egina and Phigalia, the same law is marked as inviolable, and there is neither foot nor finger of those many hundreds of figures which is excised, scarcely a piece of flying drapery but is complete. Turn to the sculptors of the Middle Ages, and in their works no violation of the law in question appears to have been sanctioned. The figures in the quatrefoils on the west front of Wells Cathedral, wrought ere Cimabue was born, illustrate the feelings of their carvers on this point. In the portal of St. Trophime, at Arles, the saints are standing side by side, but not one has lost a limb; in the tympan over the door of the same portal the figure of Christ is brought in front of the architectural lines, not, however, so as to break them violently; this is observable with regard to the nimbi of the saints before named. There is one exception—the tympan at Autun, where the claw-foot of an Evil Spirit passes beyond the boundary of the design; but in this case the artist has been careful enough to give the end of the limb as it appears outside the line. Over the doors at Auxerre, in the voussours and sides of the portals of that cathedral, as well as at Bourges, St. Gilles, Sens, Vezelay, and elsewhere—whether the work be grave Romanesque, soaring spiritual Gothic, or exuberant

Flamboyant—in it the rule was obeyed, in small things as in great. As to Michel Angelo, let any one take up an engraving from the roof of the Sistine Chapel, and see at what sacrifices of grace the great master obtained the privilege of making his figures large in size, and at the same time left them whole and unmaimed. There would have been no difficulty in the matter if Buonarrotti had been content to reduce the size of his figures; this he would not do, and yet he succeeded in occupying every one of those strangely-shaped compartments with magnificent examples of composition—that they should *compose* was really the hardship of the achievement—such as, in their way, are unsurpassed. We doubt if there is a single figure on the roof of the Sistine Chapel which does not comply with the law we have endeavoured to recall. From the pediment of the Parthenon to the trefoils at Chichester, that law has been obeyed. Michel Angelo did not dispense with it.

Unity and Variety.

The most universal feature in the various kinds of beautiful or pleasing objects the generality of philosophers have held to consist of unity amid variety, and the apprehension of this perfection is an intellectual act. Symmetry, order, fitness, harmony and the like are but special forms of this unity. The suitable proportions of the lineaments of the face, of the limbs of an animal, and of the constituent portions of a building, the admirable co-ordination of the several parts of a flower, and the unity of ideas which should run through a musical air, a poem, or a drama, are all but varying expressions of the one amid the manifold. Monotony is painful, sameness wearies the faculties. On the other hand, chaotic multiplicity, disorderly change, overpowers and prevents us from getting a coherent grasp of the confused mass before us. When, however, our energies are awakened into life by a rich variety of stimulus, whilst at the same time the presence of some central unity enables us to hold the several parts together with ease, there is produced in the mind a luxurious feeling of delight. A particular manifestation of this unity of thought in a work of art is utility. The mind is gratified by seeing how an object is adapted to the purpose for which it is intended. The structure of the greyhound thus embodies the idea of speed, the English dray-horse that of strength. The charm of a pillar in a piece of architecture depends as much on its obvious utility and fitness as on its own beauty, and the fundamental rule of Gothic art, that no ornament is to appear for the sake of ornament, is but a practical application of the psychological law. Objects which please indirectly, as in this way subservient to some ulterior end, are said to exhibit relative or dependent beauty; those which charm of themselves exemplify absolute, intrinsic or independent beauty. A flower taken as a whole may be described as absolutely beautiful, whilst the delight awakened by contemplating the fitness of its parts is an effect of dependent beauty. The extent and importance of this second kind of beauty gave occasion at the end of last century to the advocates of associationism to attempt the explanation of all forms of beauty by that principle. A plain of ripe, waving corn is beautiful in this view, because it suggests peace and plenty; a ruined castle because it recalls deeds of chivalry and prowess in past times. The influence of association in awakening agreeable emotions, and in giving an accidental charm to indifferent objects, is undoubtedly very great. The scenes of our childhood, familiar tunes, the rise and fall of fashions and the rules of etiquette all exhibit the beautifying force of this agency. Still it is a mistake to push the principle too far, and a sea-shell, a feather or a landscape must often win the approval of the severest æsthetic judgment apart from any extrinsic which it may possess.

The Hylesinus Destructor and London Trees.

About seventy years ago the elm trees in St. James's and Hyde Parks suffered much from an attack by a small beetle, and whole rows were rapidly being thinned and disappearing, both in the Mall and the Birdcage Walk. As the persons who had the charge of the plantations were entirely ignorant of the true cause of the mischief, and as it was clear that the trees died in consequence of being completely stripped of their bark, rewards were at first offered for the discovery of the delinquents who so mischievously barked them; but these were offered in vain. It was observed, however (and the observation claims some credit for its ingenuity), that no more of any tree was barked from the ground than what was easily within the reach of a soldier's bayonet; and this was sufficient to throw suspicion on some unfortunate recruits, of whom more than one was arrested, without producing any diminution of the evil. In vain, too, were persons employed to sit up during whole nights, watching for the enemy; the bark continued to be found every morning at the roots of the trees, and the park-keepers, after all their trouble, could only conclude "that the bark fell off in consequence of something being placed on the trunks in the daytime." About the same time, the elms in the Grove at Camberwell were observed to be undergoing a similar process of destruction; and the proprietors, being equally ignorant of

its cause as in the instances just mentioned, the injury was ascribed to the effects of gas escaped from the pipes for lighting the road, which had just been laid down, and legal proceedings were actually commenced for the removal of the nuisance against the gas company which had undertaken the supply. Entomologists, it is true, were aware that the operations of insects were the cause of all this mischief, but unfortunately they were not believed until the disease had reached that pitch which threatened to make remedy hopeless. But at last a naturalist was consulted, and he at once discovered that an insect, called the Hylesinus destructor, had located itself in the parks, and legions of these little fellows were quietly and constantly at work, secretly proceeding in their labours of destruction, in spite and in defiance of Lord Sydney's denunciations. But not only did MacLeay discover the cause of this evil: he, in the true spirit of philosophy, likewise directed a remedy to be applied, and these subtle miners became at once obedient to the voice of science, although they had defied the ranger's threats to prosecute them with the utmost severity of the law.

Knebworth in Hertfordshire.

The house, which stands on the highest hill in the county, was originally a large quadrangle with outer walls and courts, the east front or gateway having in truth been a portion of the ancient fort. For many years it had received little attention from its various owners, being for the most part uninhabited, till in 1811 Mrs. Bulwer Lytton, the mother of the novelist, proceeded to the task of renovation. It was found necessary to remove three sides; the fourth side, built by Sir Robert de Lytton in the earliest style of Tudor architecture, resembling Richmond Palace erected in the same reign, was preserved, strict attention being paid in all the repairs to the ancient character. The principal apartments are the banquet-hall, the oak drawing-room, the library, and the great drawing-room or presence chamber. The ceiling of the banquet-hall belongs to the age of Henry VII., the screen is Elizabethan, and the chimney-piece with the panelling appears to date from the time of Charles II., when Inigo Jones had made the Corinthian column fashionable. One door in this leads to the oak drawing-room, where, in the reign of Charles I., the great parliamentary leaders, Pym, Elliott and Hampden, used to meet to concert their measures, for the Sir William Lytton of that day, who sat in Parliament for the county, was their staunch supporter. A second door in the banquet-hall communicates with a large cellar, this being a rare remain of a singular ancient custom. In the olden time it was usual for the gentlemen after dinner to retreat, for the purpose of drinking, to a cellar adjoining the great hall, which with that view was always kept in the utmost order, and this vault is the more curious from the fact that there are few houses now remaining with similar constructions. The library, a large Gothic apartment, is entered from the oak drawing-room. The chimney-piece of this noble chamber is ornamented with the arms of the Lyttons, St. Johns, Beauchamps, Robinsons, Stanleys of Hooton and Grosvenors. A double flight of stairs leads to the state-rooms, the carved balustrades of which support the lion rampant, one of the ancient crests brought into the family by its alliance with the Strodes. The staircase itself is hung with trophies of armour of the time of Henry VII. and Henry VIII., and also with various pictures, some being family portraits. The windows are blazoned with descents from the alliance with Barrington and that of the St. Johns. The first state-room, though small, is ancient and curious from its walls being covered with old stamped leather, richly gilt and in high preservation, while the woodwork is grotesquely carved in panels. Upon the ceiling are painted the arms of Sir Rowland Lytton as heir-general to the families of Booth, Godmanster, Oke, Burnavil and Durward. Between this room and the long ante-room there is a communication. The latter deserves notice as being hung with bugle tapestry, of which it is probable that there does not exist in England a second specimen. From thence an oval drawing-room conducts to the old presence-chamber, converted by modern habits into a drawing-room, upon the ceiling and windows of which are ninety-nine quarterings brought in through the ancient families of Norreys and Robinson in the time of Anne, while the frieze below shows the arms of the descents of the late Mrs. Bulwer Lytton from the ancient British kings through Sir Owen Tudor and Elystan Glodrydd, from the Plantagenets through Ruth Barrington, and from the Tudors through Sir William Norreys's marriage with Anne Tudor, aunt to Henry VII. Amongst many relics of the olden time preserved in this room are two Gothic cabinets belonging to the age of Henry VII., sets of chairs with the old cloth of gold, a very curiously-carved and gilt procession of our Saviour to the Cross (the workmanship of the fourteenth century), and some ebony tables that were made in the time of Henry VIII. But every room in the house teams with rarities. Over the hall is the music gallery communicating with the round tower-chamber, hung with golden-stamped leather. From this is a corridor opening into the Hampden-room. The same passage leads to Queen Elizabeth's chamber.

NOTES AND COMMENTS.

WHEN, in December last, the London School Board decided to seek by competition some plans that would serve for a school on an ordinary site, it was intended to announce that the Board did not bind themselves to employ the successful architect in the erection of the school, and that the three plans, for which premiums of 150*l.*, 100*l.* and 50*l.* were awarded, should become the property of the Board. Mr. MACVICAR ANDERSON was consulted about the project, and he declared that the conditions were so prohibitory as to prevent architects of position or experience from competing. There was no doubt designs would be sent in, but they were not likely to be of value. Mr. ANDERSON proposed the following condition as a substitute:—"That the design to which the first premium may be awarded shall be the property of the Board, and that the author of such design shall be employed as architect to carry out the work in accordance with the schedule of professional charges published by the Royal Institute of British Architects." Afterwards Mr. ANDERSON added that if the Board claimed the second and third premiated designs without offering adequate compensation for them, it would prejudice the competition and deter good architects from taking part in the contest. The committee declined at first to give the needful guarantee, but it is now proposed to alter the conditions as follows:—"That three premiums of 150*l.*, 100*l.* and 50*l.* be awarded in the discretion of the assessor; that the set of plans for which the first premium shall be awarded shall be the property of the Board, and that in the event of the Board erecting a school according to the plans to which the first prize shall be awarded, the successful competitor shall be employed as architect, and shall be paid in accordance with the schedule of professional charges published by the Royal Institute of British Architects." All's well that ends well, and Mr. MACVICAR ANDERSON has been able by his firmness to gain the ends for which he strove as the representative of his brother architects.

THE subject assigned last year for the Prix Achille Leclerc, which is awarded by the Académie des Beaux-Arts, was a Bourse de Commerce in a maritime town. M. SIROT, a pupil of M. MOYAUX, was on Saturday declared the winner. The conditions of the Prix Houllévine, which is worth 200*l.*, were afterwards arranged. It is awarded every fourth year to the author of some example of painting, sculpture, architecture, engraving, musical composition, or of a book on art or the history of art produced within that period.

MESSRS. A. & C. HARSTON have so well served the Paddington Guardians as architects and for so long a period (about fourteen years), it is only natural they should regret severing their association with the Union. But they have announced that the pressure of business, which cannot be neglected, prevents them from proceeding with works which are now proposed. In their letter to the Board Messrs. HARSTON say:—"There is no other course open to us than to request the Guardians to select some other architect to take our place, to whom we shall be glad to render every assistance in our power." The Guardians, at their meeting on the 22nd inst., will consider the question of appointing a successor to Messrs. HARSTON. The Guardians have already received two or three applications, and are prepared to receive more from architects who are desirous to obtain the appointment.

THE Académie des Inscriptions et Belles-Lettres could not have found a more eligible candidate for the chair that was rendered vacant by the death of M. SIMEON LUCE than M. EUGÈNE MÜNTZ. The librarian and conservator of the collections at the Ecole des Beaux-Arts is not surpassed in knowledge of the history of the art of all countries and times by any scholar in France. The two volumes of his latest work, the "Histoire de l'Art pendant la Renaissance," are enough to make a reputation for a writer, but his "Arts à la Cour des Papes," "Raphael," "Précurseurs de la Renaissance" and numerous other works also testify to his mastery of many departments of art and archæology. We hope M. MÜNTZ may long enjoy the dignity he has so worthily earned, although it can hardly add to the interest possessed by all his books and essays. M. COURAJOD, of

the Louvre, who is an unquestionable authority on sculpture, was the principal competitor of M. MÜNTZ.

THE exhibition of MEISSONIER's works will give delight even to visitors who were fortunate to see a similar collection in the same galleries ten years ago. It is not every favourite artist who will bear the test of a contrast between his pictures. But there are circumstances which are in M. MEISSONIER's favour, and critics are likely to forget their severity before works that are so highly prized by collectors. The lending of so many precious little gems involves a good deal of self-sacrifice, however much may be the confidence the owners may have in committees and insurance societies. It is, therefore, creditable when it is found that a large proportion of the pictures will be shown in London for the benefit of the poor of Poissy, the town where M. MEISSONIER held the office of *maire*. French collectors may be assured that their property will not suffer any detriment while among us. The existing exhibition has one advantage over its predecessor, for the catalogue contains a study of the artist's character by M. ALEXANDRE DUMAS. The dramatist, we imagine, presents the early life of the painter in too sombre colours, for MEISSONIER had only a brief acquaintance with privations. But he reveals an amount of modesty in the artist that will surprise many. It will scarcely be credited that when MEISSONIER was the most prized of living artists, he was over anxious about the finish of his works, and was sincerely afraid they were not equal to the pictures and drawings by much younger men. The sight of a drawing by JACQUEMART kept him awake for the night, speculating about the manner in which the effects were produced. At another time he said he would cut off one of his fingers if by the sacrifice he was able to produce such water-colours as FORTUNY'S. He who was so fortunate with his miniatures held the name of MICHEL ANGELO in such reverence that he was once seen kissing the slippers which have survived the great Florentine. Haughty as he seemed to be, he was able to declare that he never gave way to a bad thought about any man. It would appear that MEISSONIER has been often judged wrongly, like many other artists, through ignorance of his real character.

THE demolition at Sandgate should be taken as a warning by people who wish to create new seaside resorts. The unfortunate town has grown rapidly of late years under the encouragement of the railway company and others. From the geological conditions the danger might have been foreseen. There can be no doubt that with the catastrophe any importance acquired by the town will be lost. Strangers will naturally hesitate about residing in a town which is exposed to such dangers. If the blowing up of a vessel was the proximate cause the buildings must have been exceedingly unstable. At the same time everybody must have sympathy for the sufferers, and under the circumstances it would not be unwise for the Government to help them, although the theory that there was an official error may not be recognised.

THE annual report of the Herkomer School at Bushey shows an increase in the receipts and expenditure. The total revenue for the year was 1,550*l.* 16*s.* 8*d.*, which is an increase of about 40*l.* on the amount of last year. All the items of revenue show an increase, the most important being that for fees, the receipts from which have now reached the total of 1,411*l.* 14*s.* 6*d.*, being an addition of 21*l.* on the previous year. The expenditure has, however, also increased, notwithstanding the efforts that have been made to keep the working expenses as low as possible. The profit made during the year has been 147*l.* 18*s.* 4*d.*, and the amount of 44*l.* 19*s.*, the deficiency brought forward from last year's balance-sheet, having been deducted, leaves the sum of 102*l.* 19*s.* 4*d.* as a surplus to start the new session with. The cost of erecting the new studio has been rather more than 700*l.*, and to meet this additional expenditure the Council have had to obtain a loan, but by the kindness of the treasurer, who has placed the sum of 500*l.* in school debenture bonds at the disposal of the Council for three years free of interest, this has been done at a small expense.



STANMORE
BRIGHTW

by 10th 1893.



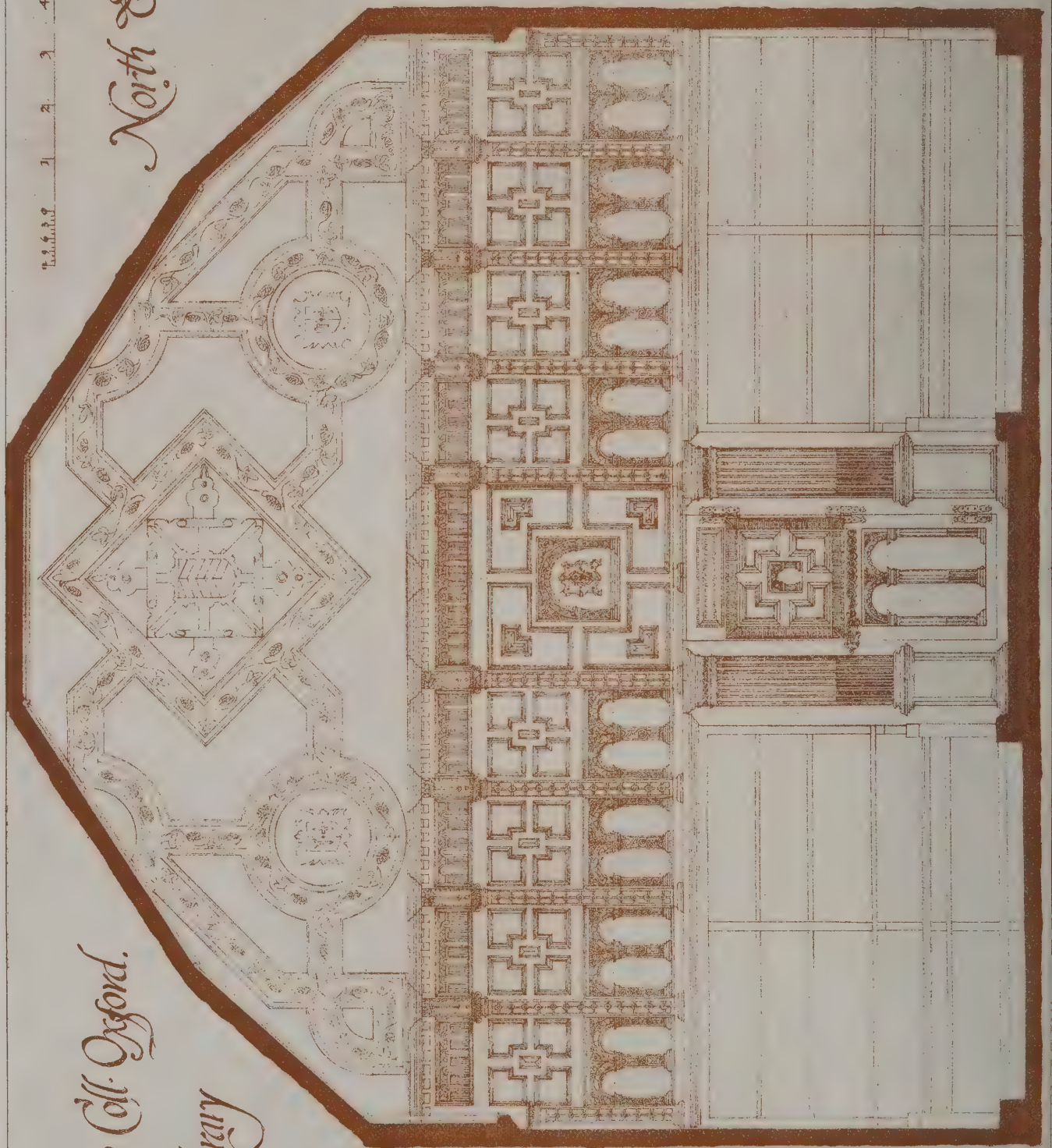
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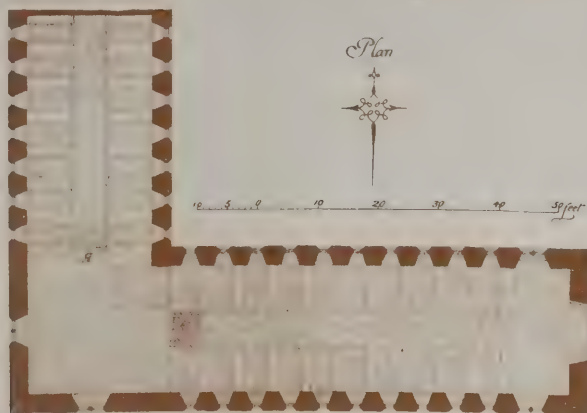
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The Library



Merton Coll. Oxford. The Library.



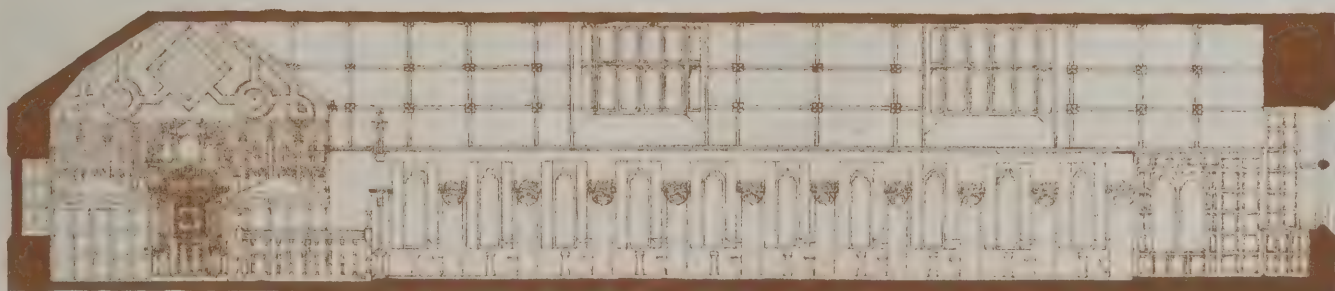
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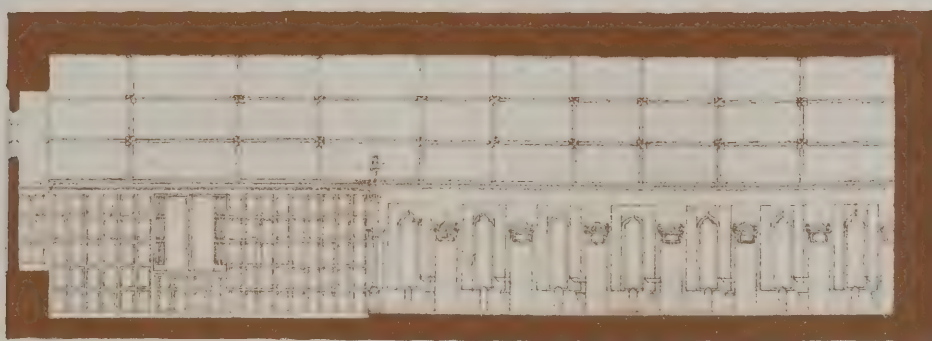
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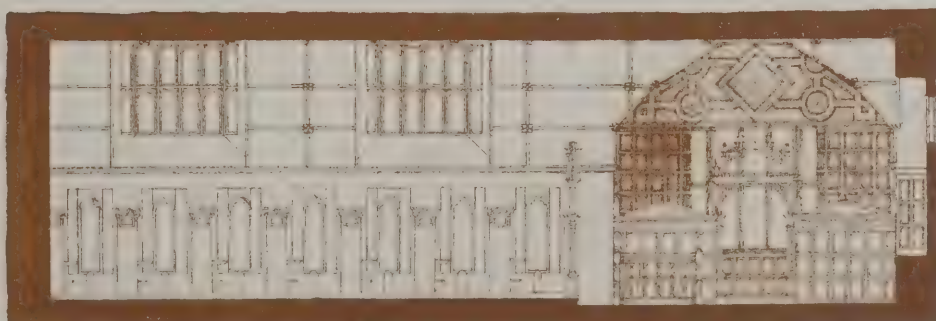
South Side.



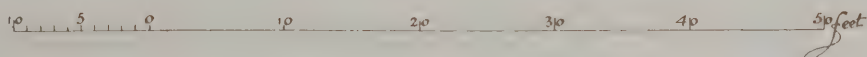
North Side.



West Side.

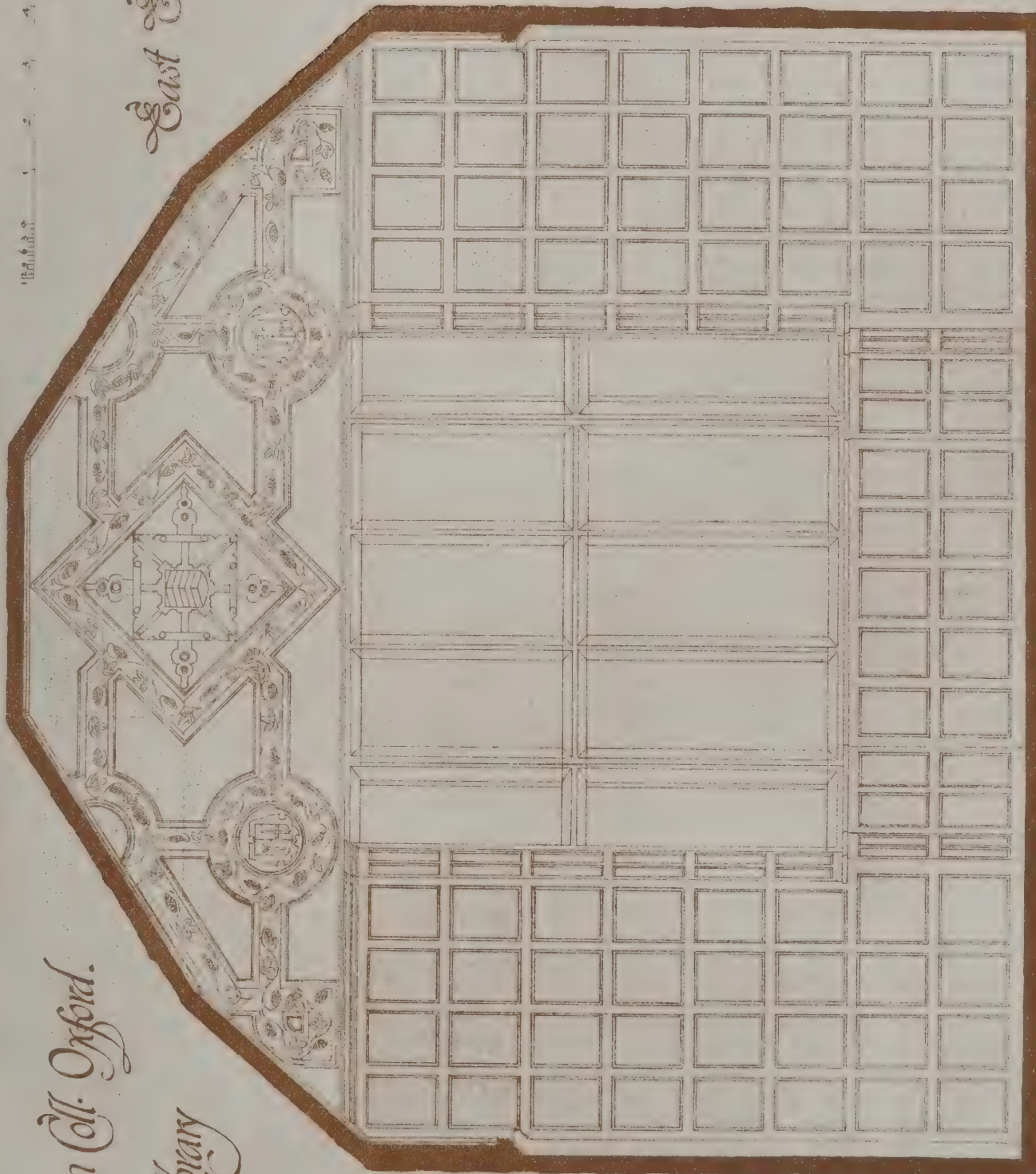


East Side.



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East End



Merton Coll. Oxford.
The Library

ILLUSTRATIONS.

STANMORE HALL.

THIS building is an example of what can be done in remodelling—a more difficult process than the construction of a new building. The works were carried out under the direction of Mr. BRIGHTWEN BINYON, of Ipswich. The illustration is reproduced from a photograph by Messrs. B. LEMERE & Co.

MERTON COLLEGE LIBRARY.

THIS is said to be the oldest building in England which has been in continual use as a library from the time of erection until the present day. The date of its foundation is about 1350. The dormers, without which very little light could have entered, were added in the sixteenth century. The woodwork was the gift of BODLEY, the founder of the Bodleian, somewhere about 1600. It is all of oak, and except the stair-head and balusters is unpolished. The plasterwork above the panelling at each end of the library was no doubt added at the same time. The roof, which was part of the original building, was renewed some years ago, but without alteration, and many of the original bosses were kept in position. With this exception, everything in the library has remained untouched. The illustrations are from measured drawings by Mr. H. M. FLETCHER.

EXPLORATION AT SILCHESTER.

AN exhibition of various objects, derived from the excavation on the site of the Roman city at Silchester, is being held at the rooms of the Society of Antiquaries, and will remain open until the end of next week. One of the objects is a fragment of a head of a colossal statue, with a mural crown, a portion of the hair, and one side of the face. It is conjectured that this belonged to the pre-Christian period, and may have constituted part of a statue of the tutelary genius Calleva, which stood in the forum before the principal entrance to the basilica. Many beautiful remnants of Purbeck marble were also found, as well as many whole pots and pieces of pottery of various degrees of excellence—some being of exquisite workmanship, and others of comparatively rough Byzantine designs. Numerous coins, articles in bronze, pewter, iron and bone were also yielded to the labours of the excavators.

The excavations of last year were carried on between May and November under the direction of Mr. Fox and Mr. W. H. St. John Hope. The operations have mainly been confined to the great central insula, with some local drivings into surrounding squares. The areas on the north, east and south sides of the forum and basilica have been carefully trenched and examined, and although mostly open ground originally, the foundations of several buildings have been met with. The north side yielded, besides the remains of a large house, an unusual number of pits from which were gathered pottery and other objects, as well as many interesting architectural fragments and pieces of worked marble. Amongst the architectural relics in the exhibition are the base of a column of the forum and a very fine capital of a Corinthian pillar. The east side revealed only slight traces of buildings, and was chiefly remarkable for an extensive deposit of oyster shells. The south side seems to have had a house at its west end. After harvest time—the city site having been under culture since the days of the retirement of the Romans—a broad strip of ground on the north side of the central insula was taken in hand, and was found to be cut off by a narrow lane leading to a large house on the west. This residence was peculiar in its arrangements, which are not easily made out by reason of various rebuildings and alterations. Gardens appear to have been attached to it. The remainder of this insula, which contains a round temple, has been reserved for excavation during the current year. The area north of the baths was singularly unproductive, probably on account of its having been open ground lying between two groups of buildings. As the foundations over many portions of the excavations have been fast weathering into decay, a good part, after careful examination, has been covered in again with soil.

The most striking result obtained is the discovery of what is believed to be the earliest Christian church in Great Britain. The outline and proportions of the church, which is within a stone's throw of the great civil basilica and forum first discovered in 1866 by the late Rev. J. G. Joyce, have been so clearly traced that Mr. Micklethwaite has been able to present a reconstruction of the edifice. It is of basilican form, with a nave, aisle and apse. The tiled space where the altar stood, with the tiles but

slightly disarranged from their original order, is plainly marked out; the ground plan shows the nave and space in front of the altar reserved for the priests, the aisles reserved for the worshippers, and the narthex at the further end of the church for the catechumens. The building was only a small one—about 45 feet by 25 feet—and it corresponds in outline and arrangement with the remains of early Christian churches in Central Syria and Numidia.

The site of the civil basilica and forum had been previously discovered. But last year's excavations have yielded such results as to enable a plausible reproduction to be effected by the Rev. Mr. Joyce, not only of the later buildings, but of an earlier one which preceded it. It was evident from the character of the remains that the earlier building had been destroyed by fire. In the first building there was a long row of pillars supporting a flat entablature. In the interval the principal of the arch supported by pillars had been discovered—a fact which seems to place the later structure some time after the period of Diocletian. The whole area of the former was about $3\frac{1}{2}$ or 4 acres. In the basilica, or rather in both basilicas, the position of the courts of justice, of the council chambers, and of the space in which elections and public meetings were held, can be made out with some approach to accuracy. In the later building one of the porticoes found in the earlier is omitted, so as to enlarge the space for public purposes. The baths, which were partially excavated some years ago, have been re-examined, and the source of the water-supply and the system of drainage have been exhumed. The tracing out of the latter, which entailed a great deal of excavating, led to an unexpected result—the discovery of a sluice or water-gate of remarkable construction in the city wall. There are hollow brick piers to carry vertical timbers, and retaining walls on each side of the passage through the inner earthwork, which have evidently been built against an earlier framing of wood.

All the objects hitherto found, except those brought to London for the present occasion, have been deposited in the Reading Museum, and carefully arranged by Dr. Stevens, the curator. The architectural remains are disposed in a separate "architectural" room. The executive committee propose to complete this year the insula in which is supposed to be situated the round temple and to excavate the insula south of this which extends to the city wall. But the committee are in urgent need of funds to carry on their work. Contributions may be sent to the treasurer, Mr. F. G. Hilton Price, 17 Collingham Gardens, S.W.

THE CORPORATION GALLERIES, GLASGOW.

THE report on the Kelvingrove Museum and Corporation Galleries of Art for 1892 states that the list of additions to the art collections in the galleries is more than usually important owing to the valuable gift of water-colour drawings by Mr. James Orrock, R.I., London. The series presented by him embraces examples of the works of Cox, De Wint, Cattermole, Bonington and others, pioneers in this branch of artistic activity, which is strictly English in its origin and early stages. It is, moreover, a department of art which hitherto has been practically unrepresented in the corporation collections, and while it forms an admirable nucleus, the gift draws prominent attention to the need for a fuller representation of water-colours generally, and of the works of the great English artists who were more or less the contemporaries and rivals of these artists. It is, further, a pleasant duty to record the gift of a portrait of a former Lord Provost of the city—William Mills—the work of Sir Henry Raeburn, and of a cabinet landscape by Horatio McCulloch, given by Mr. J. H. Downes. The whole of the works in marble in the galleries have been thoroughly cleaned in the course of the year, and thirty-two more pictures were covered with glass. Nearly all the more valuable pictures are now thus protected; and while the reflection from the glass surface is some hindrance to the comfortable inspection of the painting, the glazing will have a most beneficial influence on the conservation of the works themselves, which, while exposed to the evil influences of the Glasgow atmosphere, were certainly undergoing steady, if slow, deterioration. In the report for 1891 it was stated that the Association for the Promotion of Art and Music in Glasgow had, under the advice of Mr. Alfred Waterhouse, R.A., selected for further competition the authors of six sets of competitive designs for Museum and Art Gallery buildings in Kelvingrove Park. A final decision in the competition was arrived at in April, when, on the recommendation of Mr. Waterhouse, the designs submitted by Messrs. J. W. Simpson and Milner Allan were accepted by the committee of the Association. The architects' estimate of the cost of the complete building is 154,400*l.*, while the surveyors estimate the total cost at 170,370*l.* The precise site to be occupied by the building has been arranged between the Town Council and the Association, in terms of the agreement made on the formation of the latter body, and it is understood that the architects are now in course of preparing the

working drawings of the building. The clamant necessities of both Museum and Art Galleries for more and better space induce the committee to express an earnest hope that the least possible time will be lost in providing at least a portion of the building now agreed upon. The attendance of the public at both museum and galleries shows a considerable increase over the returns of the previous year. The steady increase of the public appreciation of the art collections, which has been made obvious for many years by increasing attendance, continues to be maintained, and there are many other signs of a healthy public interest in the galleries, of a desire for their larger usefulness, and of a growing pride in the art possessions of the city.

WALL-PAPERS AND STENCILLING.*

THE first record of the manufacture of paper-hangings in England dates from the year 1692, as a patent was taken out at that date by a William Bayley, who stated that his invention consisted of "several engines made of brass," for the printing of all sorts of paper, of all sorts of figures and colours whatsoever, and that "the said invention had not been heretofore known or practised by any of our subjects." There is no doubt the first attempts were the imitation of tapestry, linen, or other hangings that were at that time fashionable. In the reign of Queen Anne, 1712, a duty was imposed on paper-hangings. They were made on pieces, sixteen to twenty-four sheets, forming about eight square yards; each sheet bore the Government stamp; the duty was 1½d. per square yard. Paper-stainers were required to pay an annual license of 4l.

In the reign of Queen Anne paper-hangings were imported from China. Probably the first idea of their manufacture here was suggested by these importations. In 1746, larger blocks were used for wall-paper printings, some two yards long, made from light material, but these were soon found unsuitable, and were replaced by heavier and shorter blocks.

In 1753, Edward Deighton used engraved metal plates in a rolling mill. The designs were afterwards coloured by hand; gilding of parts was also introduced by him—doubtless suggested by the gilded leathers used in the sixteenth century—for wall covering. A man named Jackson, about this time, made and sold papers in imitation of statues, landscapes, &c., and quaintly remarks that "the persons who cannot purchase the statues themselves may have these prints in their places and thus effectually shew his taste." Whether his cheap antiques "caught on" I am unable to say. In a work printed by J. Nourse, in 1764, it is stated that there were three methods in use, namely, printing in colours, using the stencil, and painting with a pencil or brush.

These processes are described at some length, and approached the block printing now in use. Stencilling was found to be cheaper, but not so sharp as blocks. The pencil was used for finishing and adding further details. Flock printing was also described as giving faithful imitations of silks, velvet, damask, &c. A piece of paper was taken off the walls of a mansion near Whitehaven in 1786; it was asserted that it had been there for about 200 years. Its thickness was that of cardboard, and had evidently been fixed to the wall with varnish. The ornament had been stencilled and afterwards finished by hand.

Sherringham, of London, in 1786, as the result of journeys to the Continent, made great advances in the art of paper-staining.

Antony G. Eckhardt, in 1792, made papers from engraved copper-plates, and decorated them with silver and gold leaf. This gilding was the invention of John Hautch, of Nuremberg, about the middle of the seventeenth century. It was a preparation of tin and copper, and is now commonly known by the name of Dutch metal. Eckhardt also printed on stiffened linen, finishing by gilding and varnishing, and employing artists of considerable skill.

In 1796, T. G. Hawcock was the first to introduce embossed paper.

In the picture galleries at Hampton Court Palace are the remains of wall-papers which are asserted to date from the time of Charles I. There are, or were, some old flock papers on the walls of King William's bedroom, dressing-room, and writing-room. The date of their production I cannot state. They may not be very old, as the patterns are like the patterns used fifty years ago. Paper-hangings fifty years ago were made of several sheets, 23 × 28, fixed together in lengths of 12 yards. Lewis Robert, a French workman, in 1799, made a machine for producing paper in endless pieces; and, in 1803, John Gamble obtained a patent in England for making paper in endless sheets.

In 1836, the reduction of the duty gave a great impetus to wall-paper manufacture, with the result that their use was very much increased. In 1861 the duty was altogether abolished.

The first process in wall-paper manufacture is the prepara-

tion of the design. This, as a rule, is sketched out roughly on a small scale, but more frequently plotted out to the actual size necessary for the rollers or blocks in which it is to be cut. The usual area for roller printing is 21 inches by 21 inches; block printing gives a more extended surface, varying from 21 inches by 24 inches to 24 inches by 36 inches. On these areas the artist has to express himself as best he may, for the design must necessarily repeat itself correctly in these spaces. Should the designer be dowered with redundant imagery, these inexorable limitations become a tyranny and a chilling frost on his dreams.

It is well to work on a piece of paper 6 inches larger all round than your 21 inches by 21 inches. In the middle of this allotted space the design may be roughly sketched, running out certain large general sweeping lines across and into the outer spaces. The general purpose and direction of such lines the designer will have in his mind's eye, and if he is a fairly skilful draughtsman he may come very near the correct points on the edge of the space necessary for the repetition of his pattern. Unless the designer's conception first lives in his mental vision it will not come by any fishing process, or without previous thought or creation.

This rough design is roughly traced and placed at the sides, top, and bottom, so that the curves or other detail shall work out the correct repetition of the pattern. There are certain rules for working out in geometric patterns, but they are too complicated for present description. Some prefer to get the pattern in somewhat of a muddle, as the process of unravelling stimulates mental effort and invention—to fill up undeveloped spaces—thus obtaining more interest and thought in the detail.

When the whole design is complete in outline, it is transferred to a sheet of paper of the tint that is to predominate in your colour scheme; on this are laid the various colours in distemper as shall be used for subsequent printing. The design is carefully traced and transferred to rollers or blocks, which are destined to print the pattern on the paper.

These rollers have to be prepared with great care, and to be of thoroughly seasoned sycamore. All outlines of flowers, grounds, &c., are formed by driving into the wood, up to a gauge, copper slips, and the intervening spaces filled with felt, thus forming the printing surfaces. Sometimes the rollers are covered with paper one eighth of an inch thick, and the copper slips are hammered through into the wood, the paper acting as gauge. The paper is picked out and the spaces filled with felt. The copper bordering keeps the whole design sharp and permanent. The edges formed by the incised printing pattern, if of wood only, soon become ragged and worn.

Each colour requires a separate roller, and when attempts are made to imitate the colours and gradations of natural flowers it is no uncommon thing to have twenty separate rollers.

The enormous cost of cutting twenty rollers for the printing of one paper should be the means of opening our eyes to the fact that, if wall-papers are to conform to the best traditions of decorative art, such a multiplicity of tints can never be satisfactory. All fine decoration is simple, and of a limited scale of tints and gradations. Manufacturers now, in employing designers, generally stipulate a limited number of printings, on the score of expense of production. They thus, shall I say unconsciously, are furthering the best decorative ends, remembering that wall-paper is an adjunct, within the reach of moderate means only, not the whole end and ideal of decorative art.

For roller printing the rollers are very accurately mounted on a large revolving cylinder, the latest type of cylinder being capable of carrying sixteen printing rollers, thus, at each revolution, turning out a paper containing sixteen printings. The paper is first carried from a smaller supply-machine, which regulates the supply and tension of the material against the rollers, these being supplied with the necessary printing tints from an endless blanket roller, revolving through troughs of colour. When the paper has received its printed pattern it still further travels over a succession of rollers, through the drying-room; when perfectly dry it is transferred to a machine for cutting into lengths of 12 yards. A machine carrying two rollers produces paper at the rate of about four miles an hour.

In the blocks which are to be used for the hand-printing of wall-papers the design is first traced upon the block, and the portions which are not to be printed are cut away, leaving the design, as originally traced, in relief, and this relief surface, of course, takes the colour from the colour blanket, and that, with lever pressure, transfers itself to the paper. Occasionally however, where the lines in the drawing are very fine, it is necessary to use metal slips, as the wood would be liable, in washing and in the process of printing, to break away, or at least to warp. The block is previously dipped in a blanket-lined trough containing the colour.

In hand block-printing the paper is drawn across a long table. The printer places his block accurately on the paper, the former being regulated by him at each corner with gauge-pins, to insure accuracy at each length of printing. Then pressure, through an upright lever, is applied, and the impression made.

* A paper by Mr. T. R. Spence, read at a meeting of the Applied Art Section of the Society of Arts, and published in the Journal.

Blending is obtained by coating the blanket with a number of tints. An oblong trough, containing a number of varying colours, stands near the printer, and the attendant, with a long brush, dips it into the trough, and then brushes it over the blanket. Sometimes the blanket is merely dabbed over with several patches of colour. The colour is then transferred to the block, as previously described, the result giving blended and varying tints to different details of the design.

When the paper comes from the manufacturers it is of one uniform white tint, and requires the application of colour grounds. The paper is carried through a machine on an endless roller, over a large cylinder, above which are fixed a succession of brushes, which are of different degrees of coarseness or fineness, as may be desired to give varying textures. The paper comes in contact with an endless colour-soaked blanket which supplies the colour. After passing the brushes it travels over smaller rollers into the drying room, the length of its journey being regulated to complete its drying.

Flock paper-hangings are printed in the details of the design in size. The flock—which is composed of the cuttings of woollen cloth, cut up in a mill to the necessary degree of fineness, and dyed—is then sprinkled over the paper, adhering to the part charged with size. To get a higher surface the sizing and sprinkling is repeated.

Gold is applied much in the same manner, the metal dust being sprinkled on to the paper, and adhering to the forms previously printed in size. Gold-leaf is sometimes used, and afterwards drawn through a machine for burnishing.

Ordinary embossed papers are drawn through a machine into which is fixed a cylinder of brass, on which is cut the necessary raised design. Other methods are used, the paper being prepared with gum-size, parts are gilded, and then the paper is stamped with heated metal dies.

Embossed flock is the result of embossing on the top of ordinary flat flock.

The glittering grounds so much in vogue are produced by dusting on talc before the ground is perfectly dry, the gum contained in the colour forming a size, to which the talc adheres. These grounds, if used sparingly, give brilliant results. Fine effects are produced by printing in transparent colours on these grounds.

The most sumptuous wall-papers are those in imitation of embossed leather. The best of these have all the artistic qualities of the latter material, the only difference being that the leather will wear longer, but in the paper there is nothing to complain of on this score. The production of these is an expensive process. If cost debar us from using the material in large quantities, it can be used for friezes, say above a high oak dado, or in squares or panels. The first process in manufacturing these is to have the design embossed on a copper sheet by a man possessed of the best artistic feeling obtainable; every valuable line and form of modelling by the artist will be afterwards faithfully reproduced in the paper. From these embossed copper sheets an electrotype is taken, which forms the matrix into which the paper is pressed when in a moist state. Such a method results in far superior quality to impressions from roller-plates. The surface is gilded with gold-leaf or Dutch metal, and afterwards entirely painted by hand. These English-made papers are much more permanent than Japanese leather paper, and, I am sure, equal them in artistic qualities. Another treatment of these is to print with lacquers on a gold ground, obtaining the beauty of transparent tones of colour.

There are many other forms of wall covering made of paper, such as Japanese leather papers, Lincrusta, anaglyptic, Tynecastle tapestry, &c., which I refrain from describing, as they would require an evening devoted to them entirely.

In addition to printed paper decorations, there is another and older method called stencilling, capable of many varied and delightful results. By cutting out in paper, zinc, or brass plates, ornamental forms, and laying them on a flat surface, rubbing through with short stumpy brushes charged with colour—thus transferring the design to the object on which it is laid—any number of tints may be used, each requiring a separate stencil-plate, through which are cut the forms of each detail of each colour. There are two general methods of stencilling, the first, which gives the actual design in the colour applied; and the other, where the stencil is cut to form a background, so that the forms of the design are expressed by the original colour of the ground. The latter, in cases where practicable, gives the purest and most brilliant result. I am not able to say whether the ancient Egyptians and Greeks used this method for the numerous repetitions of their conventional designs of the lotus and acanthus. Were we using such ornament now this method would form the first stage, if they were afterwards worked on by hand. However, the historical aspect of the subject is not, in the present instance, of importance. There is little doubt stencilling was largely used in the Middle Ages. In various parts of Italy and France I have seen the roofs of churches and the ceilings of palaces covered with charming examples of pure stencilling. It was very much in vogue

during the last century and the beginning of this. In Indian temples it has been largely used. During the last century there were several guilds of stencillers, as it was an important form of industry. The Japanese have used it for the decoration of various materials, many of their silks and other dress materials being covered with ornament executed in this manner. Their skill in cutting the most delicate lines and forms has enabled them to execute the most wonderful and complicated schemes of colour decoration on almost any substance. They cut the patterns in paper made of mulberry fibre, four or five at a time, with a long thin knife and delicate punches. When finished one sheet is covered with some adhesive material. On this is placed a number of threads of silk, which form ties to hold the whole design together. This process completed, another cut sheet is placed over the threads and underlying stencils, and the whole pressed accurately together. I believe in many human hair is used instead of silk.

All the same effects as are found in wall-papers may be achieved by stencilling. From the examples shown here of stencilling applied to wall-papers by an advanced modern method, we find qualities much beyond what is usually accepted as stencilling. The process is not to be described any more than that of painting a fine water-colour, in which the artist uses numberless methods of his own to arrive at the expression of his idea. You may stencil bright ornament on a dead ground, or *vice versa*. The forms may be raised with repeated application of colour, or stencilling may be executed on any specially prepared uneven textured ground. It may be and is used largely for stencilling in the general colour of any ornament on which you propose to relieve by shading or tinting, and is a very simple and direct method for accurate setting out, as it were, elaborate arrangements of ornament for such subsequent finish. In the decoration in ornamental forms of large interiors it forms the basis of all detail.

In cutting stencil-plates ties are necessary, in every detail, to hold the plates together. These, if judiciously distributed, form a great additional element to the beauty of the design, giving a fillip of light over the decorated surface. A practice to be condemned is what is termed the mending of ties. This method takes all the life out of the work.

In conjunction with wall-papers stencilling has many uses, such as the filling of forms where the set pattern of the paper will not apply, and is very effective in filling in special forms, such as the spandrels of arches, recesses, friezes, oddly enclosed and moulded spaces. Given such unusual shapes, opportunities occur for giving your whole scheme of decoration a fillip, additional interest and unity.

In the wall-papers now produced by many manufacturers we have, at a moderate cost, a means of using a very extended scale of the finest ornamental forms clothed in garments of an almost infinite number of colour gradations, whether the schemes in detail are strong, broad, or delicate. Those who possess any innate sense of good colour, and a perception of the conditions of lighting and forms of rooms, may, in their homes, have their love of harmonies gratified.

Now that our education in decoration (as exemplified in wall-papers) has been so much advanced during this last twenty years, instead of using narrow strips or borders about 3 inches wide, we crown our wall spaces with a frieze from 12 inches to 24 inches wide, thus having a fairly liberal decorative area. Such dimensions, I think, might be increased with advantage to 36 inches, or even 40 inches. The frieze is now generally divided from the wall filling below by a moulded picture rail 2½ inches deep, making a pleasant and decided separation between the two.

These mouldings have a groove on the upper edge, into which small brass hooks are placed, on which to hang pictures. It is both a useful and ornamental treatment, and obviates the use of brass rods, which are difficult to fix and soon tarnish.

I advocate the use of a deep 30-inch frieze for various reasons. In the first place its generous area cuts to some degree the fetters of the designer. Here he may do his best, and when it is fixed we get the true and undisturbed value of his imagination. All the pictures being below his scheme of decoration, the moulding and frieze defeats that common practice of hanging pictures near the ceiling, and of building them up in pyramids on the wall under the vain delusion that they "match."

We quite forget that the treasures we hang on our walls are there for the delight of examination, and consequent revelation of whatever charm they may possess in themselves. By means of the picture rail and deep frieze we get nearly all our pictures on the line. This is the haven in which the artists who produce them would have them rest. The best position for all landscapes should be where their horizons are level with the eye. So also figures should have their eyes level with the spectator if possible.

I have no sympathy with the common idea that you decrease the apparent height of your rooms by deep friezes, supposing you do suffer from the optical delusion of losing 6 inches. Is there not a sense of quaintness and comfort in a

room that is low? At any rate, we all feel how pleasant and cosy are the old farmhouses with low-timbered ceilings. This sense of snugness is well illustrated at the Château of Blois, where the timbered ceilings of the rooms are comparatively low, and are coloured a sea-green blue, to which is superadded an abundance of coloured and stencilled ornament. There is a sense of restfulness and comfort in the two small ante-rooms (having ceilings of a similar character of decoration) which come between the two great halls or council-chambers in the Ducal Palace in Venice. The vast pictures by Veronese and Tintoretto in the large halls are wonderful in themselves, but I venture to say they do not express the same quiet decorative fitness as do these small ante-rooms. The same may be said of the suite of small low-ceilinged rooms which were the favourite private apartments of Isabella d'Este in the Ducal Palace at Mantua.

This palace is by many considered the most magnificent example of interior decoration of the Renaissance. Yet these rooms and their decorations only live in one's memory out of the hundreds of magnificent apartments in this vast palace. I can well imagine the haven of rest they must have been to the daughter of the Ferrara's, amidst the turbulent magnificence of the Gonzaga's. Of course, they have the added charm of low windows and vistas of the Lombard plains. In the Palazzo Rezzonico, now occupied by Mr. Browning, is a magnificent suite of reception-rooms decorated by Tiepolo; attached to these is a suite of smaller rooms, delightfully quaint and low, showing that the old Venetians had combined with a love of magnificence a true appreciation of the pleasure to be found in a low and shadowed retreat. I by no means deprecate the fine sense of space and magnificence of rooms having large and generous dimensions, but we, who of necessity must live in apartments of small dimensions, should accept their proportions and devise our treatment accordingly, not cherishing the fallacy that good decoration consists of delusions of scale.

All papers used in staircases, and other apartments where the light is defective, should have their ornament bold and strong, delicate combinations of tones being reserved for rooms well lighted. There is a tradition that all ceilings should be light in scale. Well, many should be, but they may be successful in deeper and richer tones.

Remember the blue of a summer sky sometimes, and use it as a suggestion.

Gold, on ordinary papers, when perfectly flat, is not always pleasant. The true glory of gold refuses to express itself except on undulating surfaces, where its metallic lustre is developed.

In colouring the surrounding woodwork of rooms, it is a comparatively safe rule to select a tint from some section of the ornament in the wall-paper. In selecting wall, frieze and ceiling-papers, it is well that the wall-paper should be darkest in tone, the others ascending in the scale of light, and each having the same tints of colour running through, but in varying degrees. This is recommended as avoiding an effect of disturbed harmony, but possessing a colour instinct, daring arrangements of contrasts may be accomplished with success. I should say, avoid marbled wall-papers, even if a Tadema is outside your means.

The great weakness of English colouring is its paucity. There is no reason why our wall-papers should not be fuller and richer, containing more primaries and less dirty tones. The shadows made by projecting furniture and the absence of really brilliant light will always soften and give negative tones.

The old Venetians revelled in the fulness of tones; why should we not follow their example, and take suggestions from their source of inspiration, which was the barbaric splendour of Eastern colour? We all recognise and admire the redundant richness of colour as found in Persian fabrics, Japanese lacquers and Moresque tiles. If this wealth and brilliancy is a delight in sunnier lands, it should be doubly welcome to us, where grey days are our portion, and the consequent need of the joys of colour charm all the greater.

It is an error to think that on a ground of strong colour our pictures suffer. If we take care that our areas of colour are flat, and contain some sense of broad unity in the whole scheme, this will not occur. I mean in the absence of every disturbing or restless detail, such as we find in the elaborately printed efforts to reproduce naturalistic flowers, &c. I feel that these backgrounds may be as strong as you like, if the parts are well balanced, and each colour of pretty near the same depth of tone. Gold or black picture-frames are a sufficient separation. Besides, these being nearest the eye are made up of mouldings, such modelled forms carrying the highest lights and the strongest darks, lift them clearly away from the merely surface colour on which they hang. If you place any actual object on the most powerfully painted picture, it will always tell as a strong disturbing element.

As the best French painters teach, the accessory, or object to be represented on the first plane, or nearest to the spectator, should carry the highest lights and the intensest darks. Strong lights may be used in the receding planes of the picture; but,

to express their relative relations, the gradations of the shadows must be weaker in degree as distances are expressed.

This constructive method is, therefore, a question of values, so that the assertive expression of a moulded form cannot be much weakened by a backing of flat colour. Black or gold, even if assertive, is always valuable in any colour scheme. No one knows this better than the Easterns, as you will find these two elements playing an important part in all their compositions.

When gold is used it should be in liberal areas, not in thin strips, which is commonly known as "hatching." A common cry now is, that what is termed an "all over" treatment is best; that is, the areas of the details of the design should be nearly all equal, so that no feature should obtrude itself in the design. I am not altogether in sympathy with this variation in areas; the treatment may be rendered quiet in effect by a nearer relationship of tones in the colouring. If certain strong elements in the design assert themselves, in horizontal and perpendicular lines, why quarrel with such results, as nearly all fine expression in architecture is obtained by the accentuation of horizontal or vertical lines; triangular assertions of features are certainly objectionable.

I have every reverence for the great designs of the past and its suggestions, and there are certain dignified uniting lines and forms that we may well borrow from the Renaissance, or other periods of ornament, which are invaluable in the expression of vertical or horizontal forms necessary to fill certain decorative spaces, but underlying or woven into such valuable accentuating forms of expression there should be added something of the designer's own individuality or creation. I am sorry to see so much borrowed from the period of the decline of fine styles.

It is lamentable to see the present craze for the slavish copying of French Rococo ornament, a period containing all the worst features of an expiring art. How these can be accepted in preference to the fine English feeling for design and colour, exemplified in the productions of our manufacturers during the last fifteen or twenty years, is a mystery to me. The French papers at the exhibition of 1889 may have created this fashion. If such is the case, the influence has been on the wrong side, for I am sure the wealth of colour, original and artistic design of the English exhibits of this material completely threw in the shade the worn-out features of French design. Their patterns gave evidence of archæology dressed in smart new clothes only, not of any new thought.

Two of the most important qualities in decorative design for wall-papers should, I take it, be a general flatness and colour harmony.

By the former I mean the spaces of colour forming the scheme should be flat in themselves. If any attempt is made at relief, it should be of a rigid or conventional character, in the form of precise lines or melting gradations, following and accentuating the leaves and other forms, &c. Flowers modelled with endless printings defeat the repose and breadth of wall-paper as a decorative accessory. How can we hope to give the adequate subtlety of the numberless gradations of flowers by machine printing and the crudeness of distemper colour when the best of the Dutch flower painters fail, with all their delicate manipulation, endless labour, and the wider range of possibilities of the mediums of oil or pure water-colour, in rendering perfectly the numberless subtle tones of flowers?

The aim of wall-paper decorations is not realism.

If flowers and foliage are the source from which our creation springs, we should try to give an idealisation of their charms, coupled with a subtle and critical selection of those parts that assume the finest curves and give the most interesting areas of colour. This idealisation must be expressed by what I may term convention, or a fine sense of adaptation and ordered arrangement to its decorative purpose.

We venture on a thorny path when we talk of the artistic treatment of wall-papers. Any theories that I may have propounded are only those of an individual. Gather lessons in decorative colour from the broad unity and tender harmonies of twilight, rather than the restless brilliancy of noon.

We are now so stored with knowledge of every period and style of decoration, that the expression of any personal views or attempts at creation is like venturing on thin ice.

We hear from one that the archaic work of the Greeks is greater than its perfect fulfilment in the age of Phidias; from another that the art of the Mediaeval ages embraced all that was living and fervid. Raphael and Michel Angelo are torn from their thrones to make room for Carpaccio, Bellini, and Botticelli. Rembrandt gives way to Velasquez. Pre-Raphaelism is asserted to be a dead letter, and the new and brilliant planet, dubbed Impressionism, to contain the cream and embodiment of all art, and so on and so on.

I make no apologies for quoting the great painters of the past as bearing on ornament. I maintain that mere ornamentalists have not given us better decorative forms (exclusive of figures) than the former.

The searching nature of a painter's practice goes deeper into the mysteries of colour in relation to nature, and when he adds ornament to his work it is, I take it, more subtle than that of the man whose aim is on a lower scale.

I fail to find ornament containing more colour, harmonies and invention than that found in the works of Francesca, Carlo Caravelli, Mantegna and Holbein.

It seems to me the invention, beauty and variety of ornament as displayed in Mantegna's frescoes in the church of the Eremitana at Padua, the castle of Mantua, and the church of St. Zeno in Verona has never been excelled by men whose sole function is the making of ornamental design. The strength, vigour, redundancy of colour and decorative fitness displayed by him in the use of apples, lemons, pomegranates, olive and laurel leaves, &c. (which are so essentially decorative in themselves, quite independent of archæological detail), show a veritable triumph from a decorator's point of view.

We may endeavour to unweave the web of fashions and infatuations for distinct periods, and clearly find that in all of them great truths and precious jewels of beauty were perpetuated. There is one advantage in these fashions, namely, that the close research into each period of each man's work reveals a special charm of its own. They tell the ordered story of the revelations that were vouchsafed to themselves. The horizons of their accomplishments should not, however, enfold ours; from them we may gather guidance and suggestions only, which shall increase the clearness of our mental visions in endeavours to evolve newer forms of beauty from the treasure-

Bygones.

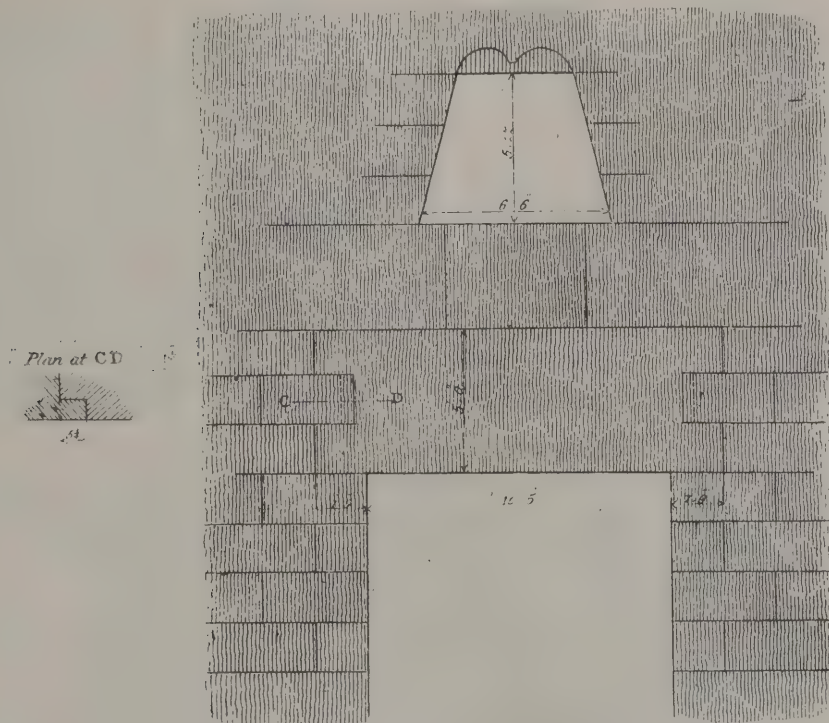
"Antiquity after a time has the grace of novelty."—HAZLITT.

STRAIGHT HEADS OR FLAT ARCHES.

NEARLY sixty years ago Sydney Smirke, who was afterwards a Royal Academician and professor of architecture, wrote an essay, which we are afraid is now forgotten, on the mode adopted by masons at various and distant periods in forming a straight head over an aperture. As attention is generally monopolised by arching of Eastern, Roman and Mediæval types, substitutes for lintels may appear to be obsolete, but there ought to be some interest found in arrangements of masonry which are evidence of the skill of the old builders. Mr. Smirke's observations on them are as follows:—

It was remarked by the late eminent engineer, Mr. Milne, that in his tour through the classical regions of Europe, he derived more professional benefit from an examination of the construction of ancient masonry than from any other subject that engaged his attention.

But it is not only on classic ground that this subject demands attention, nor is it upon works of the earliest antiquity alone that our examination of the artifices of construction can be advantageously bestowed. I am persuaded that if as much



NO. 1.—FROM THE TEMPLE OF CONCORD, AGRIGENTUM.

house of nature. Let not our accumulation of knowledge forge fetters to dull or stifle the creative qualities with which we may be dowered. Remember that design is not adaptation only.

When we have re-adapted, placed here, placed there, turned round and twisted in numberless ways the details of other periods, until the hackneyed forms become a weariness rather than a pleasure amongst our household gods, we may awake to the conviction that there is, in the garments of the earth, an inexhaustible mine of lovely colour and forms crying out for translation.

Why not, metaphorically, sail with the bees down the summer winds, and sip the honey of suggestions (so fraught with the seeds of creation) from a thousand flowers, from the sinuous anatomy of trees and plants, the plumage of birds, the colour harmonies of shells and autumn leaves, of moss and lichen, and the countless details of nature? If your worship of her is sincere, then will follow the clearness of vision to grasp her revelations.

I must tender my sincere thanks to Messrs. Jeffrey & Co., Messrs. Woollams & Co., Messrs. Essex & Co., and Messrs. Hayward & Sons, for their kindness in exhibiting so many beautiful examples which clearly show the premier position our English manufacturers hold in the production of this material.

attention were paid to the substantial details of structure visible in our own old buildings as has been given to the contour of mouldings and other purely ornamental forms, much light would be thrown upon the disputed chronology of these and similar works, and many data of general application might perhaps be established. This is a vein of inquiry to which I beg leave to invite the attention of intelligent and competent observers, and in the pursuit of which I think they may anticipate a profitable result.

As an example of the sort of inquiry which I have suggested, I submit some sketches explanatory of the mode adopted by masons at various and distant periods in forming a straight head over an aperture.

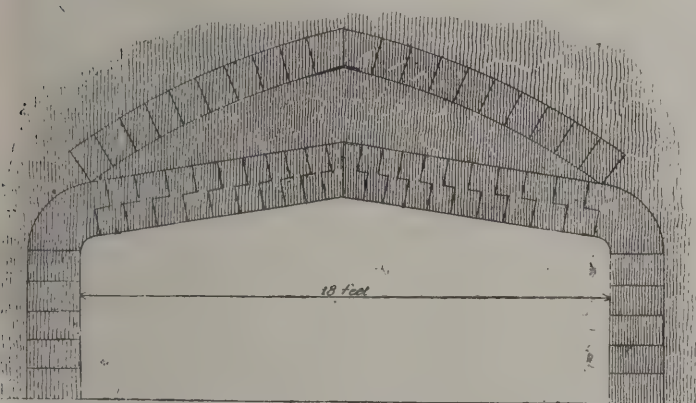
No. 1 is a representation, drawn from detailed memoranda taken by myself in 1825, of the lintel over the great doorway leading into the cella of the temple usually called the Temple of Concord, on the site of the ancient Agrigentum, in Sicily. The date of this building, like most of the Greek remains in that island, is unfortunately unknown; Biscari and other Sicilian antiquaries consider it to belong to a period subsequent to the Punic war, because Diodorus states all the temples of Agrigentum to have been either burnt or wholly destroyed by frequent sieges, whereas this building is remaining tolerably perfect; but this does not appear to me conclusive evidence, for although the columns, entablature and cella walls are certainly in better condition in respect to their

face and out of sight, they radiate like the joints of a skemearch: otherwise it is difficult to understand how these stones can support the weight imposed upon them; certainly the excrescences on the sides of the stones by which they are locked into each other, and which in mason's language would be called a "joggle," have but little effect in keeping them up. The face of these stones is, as you well know, richly carved, each with a separate device; they are irregular in size, the abutment stones being very dissimilar; indeed, a great want of correspondence and regularity of structure prevails throughout not only this doorway, but the whole west front of the edifice in question, and it is difficult to believe that any working drawing could have been prepared for the guidance of the masons in the execution of their work.

This fourth example brings us down to the commencement of the twelfth century, the date which I presume may be confidently assigned to the west front of Rochester Cathedral.

For the sketch No. 5 I am indebted to a friend. It is stated to be the representation of the masonry of a chimney-opening in an old kitchen at Edgcot, Northamptonshire. Although the capacious opening here shown is not covered by a straight head, as in the preceding cases, the Pointed arch which spans it is so nearly flat as to entitle it to our notice on the present occasion. I know not the age of this example, but I presume it to be of the later period of the Pointed style.

It is worthy of observation that the break or shoulder in the radiating joints is discernible in some semicircular arches at the Gothic tomb in Ravenna above referred to, and I have also noticed this singular contrivance in the engraved representations of an old building of the Pointed epoch at Cairo.



NO. 5.—CHIMNEY OPENING AT EDGCOT, NORTHAMPTONSHIRE.

The occurrence of the same peculiarity of structure in localities so distant from each other, a peculiarity unknown to Classic art, and long disused in modern art, is a curious fact, and might perhaps suggest interesting reflections; but I forbear to indulge in any speculations on this subject.

The five examples here brought into juxtaposition to show the efforts of workmen to produce the same effect with the same material, at periods and in places so widely distant, serve to illustrate the condition of the arts at their respective periods.

Nothing can exceed the beautiful precision and masterly execution of the masonry in the first, or Greek, example; its excellence is indeed sufficiently attested by the comparatively complete state of the work, notwithstanding the lapse of more than twenty centuries, the devastation of war, and the still more destructive earthquakes of which Sicily has been the scene. But art was still young, and the progress of mechanical knowledge not great; the arch was unknown, and the Greek mason had no resource but the obvious and inartificial one of forming his straight doorway with a block of depth and strength enough to bear its burden, notwithstanding the trouble that necessarily attended the process.

The second, or Roman example, has still much of the excellence that characterises the workmanship of classic times; and indicates, moreover, that since the date of the preceding example a stride had been made in the progress of the science of construction that was destined to effect a total revolution in architectural design, for cuneiform stones are here used to form a flat arch.

The third example, of what may truly be called the Gothic period, strongly marks the decadence of good art; although the masonry is executed with much precision, the rebate or shoulder in the radiating joint is a piece of mistaken construction that would not have been made in better times.

The fourth, or Norman example, and the fifth, of a still later period, illustrate that elaborately artificial manner which, both in design and construction, characterises the Mediæval architecture of Europe.

DEVON AND EXETER ARCHITECTURAL SOCIETY.

AT the annual meeting of the Devon and Exeter Society, Mr. E. H. Harbottle presided. He told the members they had every reason to be satisfied with the work of the Society during the past year. They were now in a more satisfactory position than last year. He spoke of the pleasure which the excursions gave to the members, and referred also to various engineering movements which had taken place in recent years. The annual report stated that during the past year the work of the Society had been, regarded as a whole, satisfactory, though in certain respects an improvement was very desirable. The meetings held had been fairly attended, and all papers read were of great interest, giving rise to profitable discussions of the subjects treated on. The balance-sheet showed an increased income, but along with it a greatly increased expenditure, caused principally by the contributions towards the excursions. The Council had satisfaction in reporting that the request made for summer excursions was cordially responded to by offers to conduct the excursions, and they were consequently very successful. The Council appealed to members to do all in their power to increase the number of members, and to assist them in this way, and, by bringing under the notice of junior members of the profession the work of the Society, to make its position more thoroughly sound. The Council were also desirous of encouraging the delivery of papers by the junior as well as senior members, and felt that in such a county as Devonshire there must be many who could give a most interesting paper on matters closely allied with the profession. There was a balance in hand of 154. 9s. Colonel Appleton was elected the president for the ensuing year, Mr. J. Jerman was elected vice-president, Mr. C. J. Tait was reappointed hon. treasurer, and Mr. Edward George Warren hon. secretary.

NEW INN HALL, OXFORD.

THE building selected for examination at the first excursion of the Oxford Architectural and Historical Society was New Inn Hall. Mr. James Parker acted as *cicerone*. He said it would be impossible to carry the history, even of the site of the building, further back than the year 1349, but beginning with that year he remarked that, according to a deed preserved in the Treasury of New College, and dated April 11 in the 23rd year of Edw. III. (1349), certain lands and tenements were given by Frideswyde Pennard to John Trilleck, who was then Bishop of Hereford. On his death, November 30, 1360, he left no will, and the property passed to his brother, Thomas, who in 1364 became Bishop of Rochester, and in 1366 conveyed the land and tenements to trustees, viz. Hugh Pembridge, Roger Ottery, and Walter Brown, from whom in 1369 the tenements, &c., were purchased by the Bishop of Winchester, William of Wykeham. Wykeham had been consecrated Bishop of Winchester in 1367, and in the following year had been promoted to the office of Chancellor of the Kingdom. He had possibly before his appointment determined on founding a college at Oxford should he ever have the means, and the two appointments evidently opened up to him the opportunity of fulfilling his wish. Now the date of the purchase of Bishop Trilleck's property, according to the register in New College (if Wood's note is correct) is November 7, 43 Edw. III., i.e. November 1369, and so far as the lecturer's knowledge went, this was the first property purchased by him in Oxford. The first piece of property on the site of New College, purchased for him by his attorneys, was February 10, in the 44th year of Edward III., i.e. February 1373, or three months afterwards, namely, in the parish of St. Peter's-in-the-East, not in that of St. Peter-le-Bailey. It would be perhaps too much to argue from this fact that his first intention was to build his college on the site of Trilleck's Inn, overlooking the western wall, or rather western ditch, of Oxford, and that afterwards circumstances led him to build his college beneath the eastern wall of Oxford. The probabilities are that before building his college he foresaw that he would want accommodation for his students which he would send up from his diocese while the college was in process of erection, so that when it was completed they could enter it in a body, which they did not do till April 1386, that is, sixteen years after he bought the first plot of ground. Probably after 1386, when Wykeham's College was ready, it reverted to its former purposes, and was used as one of the inns (*Hospitia*), and was let to various tenants, first of all by the bishop himself, and afterwards by the College. From several of the college rolls it would appear that for a time some members of the Cistercian Order, or Bernardines, as they are called, occupied this inn. They had been long scattered through different inns in Oxford till Archbishop Chichele gathered them together and gave them a house in

St. Giles's, becoming eventually in 1437 (according to the letters patent then granted) St. Bernard's College (which practically continued after the Dissolution down to 1549, and was then bought by Sir Thomas White and became St. John's College). During this time, however, when the inn was occupied by the Bernardines, New College spent a good deal of money on it, especially in 8th of Henry IV. (1406), and there is a reference in the bursarial accounts (on the authority of Dr. Ingram) implying that a chapel was built for the use of the Bernardines, but he adds that no traces of it were apparent. It appears, however, by the same accounts, that some twenty years or so after the Bernardines had left in order to occupy their new abode in St. Giles's, viz. in 1460, Trilleck's Inn was entirely rebuilt by the Warden and Scholars of New College. It is probable that on this rebuilding the Hall lost the name of Trilleck's Inn, and was then called "The New Inn." Though it has been suggested that it was called so from its connection with New College, it was more probably so called because it was newly-built. John Rouse, practically a contemporary, writes:—"Trillockynne, which is now called New Inn (*Novum Hospitium*), because it has been newly-built." The principals of this hall seem at first to have succeeded each other rapidly, few staying long, and becoming principals of other halls. Further, it may be noted that at first mostly New College men seem to have been appointed. The second principal was named Eberlow, who succeeded in 1444; followed in 1445 by Wytney, of New College; in 1461 by Pavy, of New College; in 1462 by Hanington, of New College; in 1468 by Cocks, of New College; in 1469 by Hogan, and later in the year by Welsh (of what college is not to be ascertained, but probably New College); in 1484 by Dr. Lychfield, of New College, and so on to the end of the century. But it is also to be observed that from the time of Dr. Lychfield nearly all the principals had acquired a D.C.L. or at least a B.C.L. degree. Some were doctors of canon law, others of civil law, and it might with some reason be submitted that the "New Inn" had acquired a notoriety for the study of law. Several of the principals rose to high positions in Church and State, as well as in the University. John Worthiall, for instance, appointed 1514, became Archdeacon of Chichester; Dr. Barrett, 1529, became canon of King Henry VIII.'s College in Oxford; Dr. Wright, appointed later the same year, was appointed moderator of the Canon Law School in Oxford; Rowland Meyrick, appointed 1534, became chancellor of St. David's, and in 1559, on the accession of Elizabeth, bishop of Bangor. David Lewys, 1546, became the first principal of Jesus College (a college which by chance the Society had just visited that afternoon). He was fellow of All Souls, and from this date members of All Souls seem (as was pointed out to the lecturer by Professor Holland) to have had almost the monopoly of the appointments to the principalship for some forty years. New Inn Hall during the time of the Puritan ascendancy was presided over by Christopher Rogers (appointed by the Long Parliament a canon of Christ Church). At this time the hall, in conjunction with Magdalen Hall, had (according to Antony Wood) the enviable notoriety—or otherwise—of being styled the "two nests of Precisians and Puritans," and for these matters we have in Wood practically a contemporary authority, though he was then young; but he admits, as regards the number of matriculations, the hall was very flourishing. An account of considerable interest must be mentioned in connection with this period, namely, that a decree of convocation dated January 31, 1643, granted to King Charles, for the use of his mint, all the plate, silver and gilt, to be found in any of the halls, and there had been previously, December 15, 1642, a proclamation establishing a mint in Oxford, and New Inn Hall was the site chosen. Thither the several colleges sent their plate to be melted down. The subject however of the Oxford mint here is one by itself. Many points of interest are to be noted in connection with it, e.g. the peculiarities and variations of the crown-piece struck at this mint; the various contributions from the several colleges as well as halls and even from private persons (Antony Wood's plate given him by his godfather and godmother is said to have been included), the arrangements made and the moneys employed (these were sent for from Aberystwith), and other similar matters, as well as the fire which broke out "from the roasting of a pigge," which threatened the building and gave rise to a satirical poem on the subject, printed in 1656. During the time that Oxford was held by the Royalists Dr. Prior was nominated principal by the chancellor, Christopher Rogers having been apparently ejected, but he resumed his principalship in 1656 and continued to 1662, when refusing to subscribe to the Act of Uniformity, he was again ejected. After the Restoration the fortunes of the hall varied, but one name of a principal must not be overlooked, namely, the great Sir William Blackstone. It seemed as if the renown of legal studies was still attached to the hall, his two predecessors being D.C.L.'s, and his successor, Robert Chambers, who also succeeded him in the Vinerian Professorship of Law, and he in turn was succeeded by Sir William Blackstone's nephew, who was also elected

both to the principalship and the professorship. Some of the books which were seen in one of the rooms were probably those used by Blackstone. The northern half of the tenement the members would observe had been rebuilt in the Palladian style. This building was due to Dr. Cramer, principal of the hall from 1831 to 1847 and Regius Professor of Modern History. His geographical and historical works on ancient Greece, Italy and Asia Minor were once standard works. He was succeeded by Dr. Wellesley, who was succeeded by the late principal, Dr. Cornish, who died in 1887. Since then no principal has been appointed, and it is understood that the buildings have been ceded by the University Commissioners to Balliol College, who were—(and Mr. Parker said he could only tell the members what were quite open secrets)—willing to dispose of the whole buildings to the city of Oxford, but that after the report of a committee appointed to negotiate the sale, the proposal has been practically rejected. What the future of the hall will be no one can tell; apparently, it is "for sale," and after so long, and in many respects brilliant, though at times chequered, career, this was a sad ending.

SCHOOL BUILDINGS.

Bournemouth.—St. John's Schools, Boscombe, lately erected under the provisions of the Bournemouth Church School Extension scheme, have been formally opened. Accommodation is provided for 277 children. There are two floors, with schoolroom 54 feet by 18 feet, and two classrooms 15 feet by 20 feet, the rooms upstairs being the same size. The buildings were designed by Mr. Reginald G. Pinder, F.R.I.B.A., (Pinder & Fogerty), of Bournemouth. The schools were erected by Messrs. Hoare & Sons, builders, of Bournemouth, the amount of the contract being 1,535*l*. The buildings are of red brick, with ornamental tiling. The floors are laid with wood-block paving, and the heating is by hot-water pipes, each room being also fitted with a Teale grate.

Bournemouth.—St. Andrew's Schools, Malmesbury Park, lately erected under the provisions of the Bournemouth Church School Extension Scheme, have been formally opened. The buildings provide accommodation for 318 children, there being one large room 71 feet 4 inches by 22 feet, and three classrooms 24 feet 8 inches by 23 feet. The buildings were designed by Mr. Reginald G. Pinder, F.R.I.B.A. (Pinder & Fogerty), of Bournemouth, and were erected by Messrs. George & Harding, builders, of Bournemouth, whose contract for the work was 1,911*l*. The buildings are of red brick, with ornamental tiling. The floors are laid with wood-block paving, and the heating is by hot-water pipes, each room having also a Teale grate.

Bournemouth.—The schools at Pokesdown are about to be enlarged from the plans of Messrs. Pinder & Fogerty, of Bournemouth. Additional accommodation is to be provided for 93 scholars, making the total accommodation 176. Messrs. T. Head & Sons, of Boscombe, have secured the contract, which is for 550*l*.

GENERAL.

The Competition for the St. Pancras Municipal Buildings has had the following result:—The first premium of 105*l* was awarded to Mr. W. Harrison; the second premium, 52*l*. 10*s*., to Messrs. Gibson & Russell; and the third, 26*l*. 5*s*., to Messrs. Malcolm Stark & Roundtree.

The New Bridge which is about to be constructed across the Seine, between the Pont de Grenelle and the Point du Joir, will cost 2,300,000 francs. The State will pay one-half the sum and the municipality of Paris the other half.

The Oxford Convocation on Tuesday rejected the proposal to erect a fever hospital adjoining the City Hospital at Cold Harbour.

An "Old Glasgow" Exhibition, illustrating the history and social life of the city, will be held next year.

The Paris Fountains are costly sources of enjoyment. The Fontaine Saint-Michel, at the end of the "Bou Mich," is now out of repair, and a credit of 14,750 francs has had to be opened to set it working.

Dunoon Castle and grounds will be purchased for the benefit of the burgh. The price is 4,600*l*.

The Committee for the Promotion of Art and Music in Glasgow have decided to take immediate steps towards the building of the new art and music galleries in Kelyingrove Park (for which Mr. J. W. Simpson's and Mr. M. Allan's design was accepted), the funds in hand now amounting to 113,000*l*—64,000*l* of which was subscribed.

Malling Abbey has been purchased for an Anglican sisterhood, and several noblemen have headed a movement for the building of a chapel within the grounds to the memory of Rev. J. P. Dale.

The Nave of Dunblane Cathedral, which has been roofless for 300 years, has now been reopened for use, but the work of restoration is not quite completed.

The Architect.

THE WEEK.

THE competition for the hospital founded by the late Madame BOUCICAUT having failed, as the judges could not award the first prize, some of the architects who gained the remaining prizes have memorialised the Director of the Assistance Publique. They offer to take part in a second competition if it can be arranged. The commission is not unlikely to be offered to a specialist, but if a second competition takes place, it could not well be limited to the memorialists. It is also apprehended that, with the experience of the hospital before them, the authorities will, in spite of promises, decline to arrange a competition for the Opéra Comique.

THE so-called *Ambassadors* in the National Gallery is not the only portrait-group of the sixteenth century which affords an object for interminable speculation. A paper was read at the meeting of the Society of Antiquaries of Scotland on Monday which described a work that is no less puzzling. It is now in Cardiff Castle. The principal figures are supposed to be MARGARET TUDOR and the Duke of ALBANY. The lady wears a medal which is inscribed with a passage from the thirteenth chapter of Daniel, and may be taken as allegorically asserting her innocence of the charges made against her of conspiring to procure a divorce from her husband in order to marry ALBANY. A carnation and a butterfly are also introduced. A subordinate figure that points to the latter is assumed to be an English herald, who came to Edinburgh with letters from the English Court. At one time it was believed that the painter was HOLBEIN, but it is now considered more probable that he was a contemporary artist who came to Scotland with the English herald. Sheriff MACKAY, who has been investigating the subject, concludes that the painting was likely to have been executed between February 1 and 14, 1522. If so, it could not be HOLBEIN's work, for he did not arrive in England until 1526. The picture is also assumed to have some relation to an event which occurred in Edinburgh. The Marquis of BUTE's mysterious portraits seem to be as worthy of discussion as the *Ambassadors*.

THERE is no doubt that two competitions will be held before a design for the new Munich Museum is selected. That has been the decision of the Special Commission, although the conditions of the contest are not completely formulated. Sketch designs will be sent in for the first competition, and the authors of a number of them, to be fixed hereafter, will take part in the second competition, which is expected to furnish a suitable design. But as at every step there must be consultations between Government officials, it may be doubted if the issue will be decided this year. The Bavarian builders, who are not accustomed to competitions, will no doubt grumble at the delay, for we believe an official design could be put into execution at the beginning of the summer.

THE Municipal Council of Paris may not be considered to be a model administration, but the Ordnance Department might with advantage take a lesson at the Hôtel de Ville upon the production and publication of plans. How few people in London know anything about the agents for ordnance plans. The maps of Paris are sold at the Hôtel de Ville, with which every citizen is familiar. The official plans have just been completed or revised on different scales. One plan on the scale 1-10,000th, which is nearly equivalent to the English 6 inches to the mile survey, takes in part of the suburbs, including the Bois de Boulogne and the Bois de Vincennes. There are a variety of plans which have been produced by the combining lithography with engraving, and it would not be expensive to produce maps of the city to meet special purposes whenever they are called for. The citizens can also be supplied with maps of the various arrondissements at a fraction of the cost of the general plan.

WE have more than once referred to the design which the late M. MEISSONIER had prepared for the decoration of the Panthéon of Paris. Wall-painting was not suited to his abilities, and for the sake of his reputation it was well he had not carried out his commission. M. MEISSONIER left a design, a sort of allegorical triumph of Paris, and there was a proposal to have it executed by another hand. But the scheme seems to have collapsed. M. DUPUY, the present holder of the portfolio of Minister of Public Instruction and Fine Arts, has decided to entrust the painting of the vacant space to M. PUVIS DE CHAVANNES. The selection is wise, and indeed many regret that the artist was not persuaded to paint the whole of the walls. He alone has had the courage to suggest that decoration was inferior to architecture, and the white stone pilasters that separate his paintings do not appear weak like those which are near some of the remaining paintings. We have already published illustrations of M. PUVIS DE CHAVANNES's unique series in the Panthéon.

THE contest between the Edinburgh Corporation and the North British Railway Company has advanced another stage. We have already stated how the Corporation would not grant a conveyance of the strips of the Princes Street Gardens unless the Company, in addition to paying 26,500*l.*, agreed that the servitudes of the owners of property should not be prejudiced, or in other words, undertook the whole responsibility for any actions that might be raised. The case was heard by Lord Low. The obnoxious clause was the following:—"Nothing herein contained shall prejudice the existing rights of servitude or other rights, if any, of the vassals of the Corporation of Edinburgh in virtue of their title-deeds." The Corporation maintained that they were not bound to convey to the Railway Company a greater or higher right in the lands than that which they were authorised by the Act of Parliament to take. The judge considered that if the land was subject to servitudes, he could not see how it could be used for railway purposes. He proposed that there should be, however, a declaration that the conveyance was granted under the conditions, provisions and restrictions in the Railway Companies' Act, leaving it to be decided what was the extent of that Act. It is, therefore, safe to conclude that a good many actions will arise out of the sale of the strips, but whether the defendants will be the Railway Company or the Corporation or both remains to be seen. The owners of some of the houses in Princes Street possess rights which will be affected by the contemplated works, and they can hardly be considered Scotchmen unless they seek compensation.

THE Commissioners for Public Baths and Washhouses in the parish of Chelsea announce that they have under consideration the designs, together with the specifications, submitted to them in connection with the competition for baths and washhouses at Kensal Town, and that they have determined upon the designs for which the premiums agreed upon will be given. The designs will be open to inspection by the public at the upper hall of the Town Hall, Chelsea, from Monday, March 27, to Saturday, April 8; and at the Parochial Offices, Kensal Road, from Tuesday, April 11, to Tuesday, April 18, from 10 A.M. to 5 P.M. No mottoes or names are yet known to the Commissioners, the designs being numbered only.

THE Commissioners for Public Baths and Washhouses for the parish of St. John at Hackney invited seven architects to compete for buildings to be used for public baths, offering premiums for the three selected designs. It was understood that the premium in the case of the architect employed to carry out the work would merge into the commission of 5 per cent. Ten sets of designs were submitted. The Commissioners, with the assistance of their professional adviser, Mr. T. THORNTON GREEN, unanimously selected the design bearing the motto "Compact," Scheme A, by Messrs. HARNOR & PINCHES, Adelphi, for the first premium. The design "Otter" (Mr. F. J. SMITH, Westminster) was awarded the second premium, and the design "Practical" (Messrs. SPALDING & CROSS, Queen Street, E.C.) the third premium.

THE ASSOCIATION SKETCH-BOOK.

IF the Sketch-book of the Architectural Association could be withheld from criticism in journals, and in other ways treated unlike the ordinary works which publishers place in the market, it would be an advantage to those who have most interest in its production. It is essentially a student's work, and it ought to be the expression of the fascination which certain buildings exert upon the minds of the draughtsmen. To be competent to measure and to draw a building with accuracy, or to represent its general effect, are victories which ought to gratify not only a young fellow and his friends, but other youths of his age and standing. The publication of his drawings becomes a record of his competence at the time, and will be an aid to test his progress at a later period. It is not necessary for such a purpose that out-of-the-way buildings should be sought, or even that the repetition of drawings of any building should be avoided. The primary purpose of the drawings is a display of draughtsmanship, and it is not necessary that the subjects should be helpful to practising architects, or that the execution should be up to the standard of the leading offices. When, however, the collection of sketches is made a marketable commodity the character of the drawings must be regarded under new conditions. They have to be attractive to men who care little about the authors or the Association, and who will only invest their guineas in drawings that can be turned to account. There is consequently a risk that drawings which are produced by students in the ordinary sense of the word will have to be set aside to find space for drawings by men who can claim to be architects.

Another disadvantage arises from the difficulty of testing the degree of advancement in architectural drawing. The plates in the early volumes were drawn of the exact size on transfer paper. There was more or less difficulty for a novice in using paper, pens and ink which were strange to him, and if he attempted much detail he was not likely to succeed at the first trial. But the exercise was beneficial and the plates could be produced very cheaply. Of late years the task of the contributors is simplified. They have only to make drawings with pen or brush on paper in the ordinary way on a scale that is convenient to them, and the drawings will be reproduced by one or other of the photographic processes. There is no doubt that the results appear more pleasing, but the plates are less gratifying as evidence of resolution in overcoming obstacles. In fact, the Sketch-book corresponds with the change in the character of the Association. It may now appear to be more of a collegiate body; it has its professors and lecturers, a syllabus and scholarships. But there is no longer the old self-reliance. If, too, the Sketch-book has become a portfolio of drawings which may safely be submitted to young ladies for approval and to practitioners for cribbing, much of the credit for attaining such ends is to be ascribed to processes that are mechanical. Every year the co-operation of men who are outside the Association becomes more needful, and it is the business of the editors, as well as other officers, of the Association to do all they can by mute appeals as well as by words to excite sympathy. It is not possible for the Association to enjoy the privilege of being the very obedient humble servant and purveyor to the Institute on other conditions.

If we consider the plates irrespective of their relation to the Association, they must be acknowledged, from the subjects as well as the execution, to be an interesting and useful collection. Mr. A. B. PITE furnishes the title-page. It is an architectural dream, which should delight the College of Masonry by its vaulting, arching and display of curved lines. The first plate is by Mr. KOTARO SAKURAI—a view of Barrington Court, Somersetshire, which is freely drawn. There is no fear of unshaded space, and the parts where light does not fall are not excessively dark. Mr. SAKURAI's plate of the west door of Salisbury Cathedral is from a washed drawing, and shows a desire to express the leading lines faithfully. It is remarkable to find that the foliage of the capitals appears to puzzle him, although we might suppose that any work having a floral origin would come easy to him. Mr. A. N. PATTERSON's Stanley Place, Chester, is freely drawn and there is measured detail. The lines of his details of the ambo at San Clement's, Rome, appear to

have been drawn with a fine brush. A fourth plate is the sarcophagus of FREDERIC II. at Palermo. Mr. GIMSON shows a fine doorway from Durham, and gives sections of the mouldings. It is from a pencil drawing. His figures from Laon and Rouen show appreciation of comic as well as serious sculpture. Mr. NEEDHAM WILSON has only one drawing, a very delicate view of Ely Cathedral. If he had drawn directly on the stone he would have produced a more satisfactory plate. The process which the late TALBOT BURY so well utilised (to say nothing of PROUT, HARDING and other pictorial artists) should not be allowed to become one of the lost arts. It seems peculiarly adapted to express the effect of buildings, for it can become more suggestive of detail than brush-work, and does not lend itself to random strokes like etching. Mr. E. S. CUMMINGS supplies measured details from Granton, Ely, &c., and as they are dated we can observe his progress. Mr. T. MACLAREN has selected the tower of Evercreech Church, the screen of High Ham Church and a pulpit in Lucca, the last being an exquisite example of the application of ornament. Mr. E. A. RICKARDS's ironwork from Abbott's Hospital, Guildford, and especially the latch, presents some curious appliances, but however obsolete they were not irrational. More interest will probably be excited by his woodwork from Whittington Chambers, College Hill, which is not unworthy of WREN's supervision, and the pulpit in All Hallows Barking Church, Great Tower Street, which dates from 1613, with a "hedd" which was put up in 1638 at a cost of 18*l*. A fourth drawing shows some of the panelling from the Hôtel de Ville in Oudenarde. Mr. WALTON sketches the north-west porch of Hereford Cathedral in freehand lines which were, we suppose, etched over ruled lines. The font from Hitchin Church must have been handsome. It was surrounded by figures of the Apostles cut out of the solid stone, and there were no less than four varieties of crockets used in connection with the canopies.

Mr. W. H. BIDLAKE's drawing of the Swan Inn at Knowle appears to have been drawn on transfer paper, and shows a very successful example of the search after the picturesque by the old builders. Evidently there was a belief in the advantage of variety in Knowle. Mr. BIDLAKE's Gateway of Maxstoke might be taken for a reproduction of a lithograph in crayon from his hand; he also would find an advantage in working on stone and would thus escape the flatness of photography. Mr. DODS has a geometrical drawing in clear and uniform lines of a doorway from Carey Street, but he is not quite as successful in dealing with the large curves of some Italian ironwork in the South Kensington Museum. The series of sections of mouldings from Westminster Abbey, by Mr. S. VACHER and Mr. W. G. B. LEWIS, are very valuable, but where are the eyes competent to read the lettering on Plate 18? Evidently the original drawing is most elaborate, but it was not prepared for reproduction by photography, and the writing is therefore illegible. The failure should be enough to convince the editors of the necessity for returning to the original system of drawing on transfer paper. The stalls in the Henry VII. Chapel, which are not sufficiently noticed, have afforded Mr. KITSELL materials for one of the most interesting of the plates. The interlaced ornament is suggestive. Mr. A. N. WILSON supplies several good bits in his "Sheet of Metal Work." The Jews' Hospital, and transept of St. Nicholas in Newcastle-on-Tyne, are not drawn in a commendable style by Mr. W. H. KNOWLES, and the editors ought to be firm against the admission of hurlyburlys of this sort. It is quite evident the sketches were traced from originals that were careful in their lines, and out of affectation the copies were made to assume a slap-dash character as if they were the work of minutes. Unless we are mistaken, Mr. HART's four drawings from Oxford would not give the disagreeable impression of the plates. Two are printed in a hard grey, and the others are like washed-out pencil sketches. There were apparently artistic touches throughout, but the alchemy of the sun was not favourable to them.

The five drawings, dated 1885, of St. Patrick's Church, Patrinton, "the Queen of Holderness," by Mr. W. J. TAPPER, are of the class which should be more often exemplified in the collection. They are not showy, and the author would have done better if he left out the scratches which are supposed to impart effect, but young students would

be better employed in reverential but mechanical measuring and geometrical drawing than in trying to astonish the world with realisations that are supposed to be instantaneous. Mr. BANKART prefers domestic work, and the three houses at Salisbury and Shrewsbury are picturesque representatives of three styles; the reproduction of one is unpleasantly smudged. The specimens of metalwork from the Lake House Collection were difficult to draw, and the plate by itself is almost enough to suggest that the late Mr. W. MEDLYCOTT DUKE would have one day gained reputation as an artist. Dalmeny Church, near Edinburgh, is a small Norman building, and deserved to have a better view than Mr. W. N. CUMMING condescends to give. Time must be money in the North when only opportunity for such a scrawl can be afforded. Of another character are Mr. JOHN BEGGS's two plates from Dunblane Cathedral from which many more could be derived, and one of the plates of Jedburgh. But the perspective sketch of the latter is as pretentious in its roughness and incompleteness as any of the English experiments. Kellie Castle, by Mr. R. S. LORIMER, is another of the satisfactory sets. Neither geometrical nor freehand views are perfect, but we can see that his ideas were clear, and that when sketching he did not forget his measurements.

The drawings by Mr. SCHULTZ would serve as models to be adopted by future contributors. All the parts in the mosaic floor in HADRIAN'S Stoa, Athens so well agree that they impress us with a conviction of their fidelity to the original. The same effect is produced by his sketches of the stoups from Florence and Venice, and the noble capitals from St. Mark's, Venice. It will be evident to anyone who studies the drawings that although Mr. SCHULTZ finds no difficulty in dealing with intricate detail or subtle curves, he does not despise the aid of ruled lines in much of the shading. They are, however, so well managed that they do not strike us as mechanical, and they seem to make the most fitting ground to heighten the effect of the elaborate capitals. Mr. SELBY has a sketch of a part of a painted window in Florence, which, from its correspondence with parts of the Vatican Loggia, appears to be the work of GIOVANNI DA UDINE. Two difficult subjects from Florence have been creditably treated by Mr. SHACKLE, viz. a relief on the tomb of St. ZENOBIOUS in the Duomo and the group of dancing children, both by DONATELLO. Mr. MASEY has taken some refined ornament from tombstones in St. Croce. Mr. LANCHESTER suggests the disposition of the band of angels in St. Eustorgio, Milan, and has boldly attempted a very difficult task, viz. to represent the interior of the cathedral of Siena. The collection comes to an end with two Spanish subjects by Mr. PRENTICE, a staircase at Burgos and a screen at Seville, which may, we suppose, be taken as indications of his forthcoming book. He has also a view of the basilica of St. Clement at Rome, which ecclesiologists prefer to St. Peter's. Undoubtedly the editors have contrived to supply much that is valuable to their subscribers. Whether the collection is a fair exponent of the draughtsmanship of the students of the Association may, however, be doubted.

THE INSTITUTE OF WATER-COLOUR PAINTERS.

IN spite of their defects of arrangement and lighting the galleries of the Institute of Painters in Water-Colours from their size allow the Council to show hospitality to many artists who are outsiders, and also to inspire experiments. As the sole aim of the latter is to produce effects that will be striking at a distance, it is not certain that much advantage arises to water-colour art. If the galleries were used for an exhibition of drawings by the men whose memories are held in reverence, we might safely predict that not even TURNER's masterpieces would be able to assert themselves on the walls of the Piccadilly building. Soon after the divagations began, EDMOND ABOUT said finely, "When I see water-colour art attempt to employ strong colours and aim at grand effects, I imagine that I have met a young and pretty *pensionnaire* who has fled from her convent in the habits of a mousquetaire." If we were able to criticise the drawings which are to be seen at the Institute, he could devise a stronger contrast to suggest the tendencies. But are the artists to

be blamed? With extensive galleries which are fitted not only for the exhibition of oil-paintings, but for all sorts of assemblies, they are compelled to work up their drawings, or they will be neglected. The drawings, if purchased, will generally be hung in rooms that would be reckoned small if compared with the Piccadilly galleries, but who can care about the future when he remembers that his immediate business is to produce something that will assert itself amidst seven hundred claimants for attention? We might say that nobody can occupy a very prominent position on the walls of the Institute without sacrificing some of the most desirable qualities of the art, and we therefore advise visitors who are in search of drawings in which some reverence for the old traditions are visible to examine those which are nearest the floor. It is astonishing how many works that are excellent have to be relegated every year to that level. The bigness and the banality of the rooms make it indispensable to have many works that are astonishing by their vigour rather than by delicacy predominating upon the remaining parts of the walls.

The most startling example this year is probably the *Sleep* of Mr. R. FOWLER, of Liverpool. The girl who lies so quietly among the poppies is as large as life, and therefore the mere dimensions of the drawing are enough to raise wonder. It was of course necessary to employ only opaque colours in order to gain effect; but on the whole the drawing is as subdued as an old fresco, and the colouring which suggests that the red of the poppy was employed to convert blues into purples is well adapted to the subject. But the artist could hardly do justice to such a *sonsie quean* with the process of water-colour drawing, and we recognise the skill which grappled with the difficulty; but a more successful, if less remarkable, work would have been produced in oils. The *Portia* of another Lancashire artist, Mr. SMETHAM-JONES, is a half-length of life-size. The mass of crimson in the doctor's gown at once seizes attention, and diverts it not only from the characteristic head of SHYLOCK in the background, but from the girl's own head, which is of a pleasing type. We suppose PORTIA is addressing BASSANIO, but at that moment in the play she did not possess the bond which is seen in the drawing. Mr. ST. GEORGE HARE has expended much toil in his *Melodious Musing*, a girl of Spanish type lying on her back and touching a guitar. It is no easy task to treat such a figure, especially in water-colours, but the coarseness of the features is likely to compel people to overlook the power that is seen in the modelling. Mr. RHEAM, in *Spells*, has worked out effects by means of various blues, and a comparison of the drawing with those near it reveals that a very limited palette need not involve much self-denial. But it is to be hoped Mr. RHEAM is not about to add to the ravens at the Institute. Those ominous birds have been too long a bore in the exhibitions. Mr. WEATHERHEAD has one of his simple but pleasing figures, the *Skipper's Wife*; the woman stands near a small window which casts light on her red jacket. Mr. J. W. FORSTER'S *Dryads* is decorative in arrangement, the figures being in white robes. There is timidity in the treatment, and the artist was not thinking of the antique. Mr. AUSTIN BROWN in his *New Bedding* repeats a subject which has already gained success, and with reason, for it is not within every animal-painter's powers to impart interest to a scene in a cowhouse, and make a girl act as a herd without appearing degraded, for the white calf with the brown spots is the principal figure. In a different style is the gipsy-camp at night, *Wanderers*, and excellent in its technique. Mr. GORDON BROWNE has had too much practice as an illustrator of journals and books to neglect making the most of a dramatic scene. Although the figures are vigorous enough in the *Press Gang* and the sailors are good-humoured in their struggle with the landsman—there are five against one—the scene does not appear as true to life. We prefer *Surprised*, a band of primitive cavalry attacked in a defile by invisible opponents, who cast down stones upon them. In this the unexpectedness of the attack and the inability to deal with it are well suggested. A contest as interesting to the spectators as *Sword v. Bayonet* is the subject of Mr. F. M. EVANS'S *Passage of Arms*; the girl with her broom is opposed to a man-of-war's man with a single-stick, and, accident aiding, is not unlikely to win. The contest takes place in an old-fashioned panelled room,

and a group in the background await the issue. As the sailor wears duck he appears more of a match for the girl in light cotton than if he appeared in a serge jacket. The scene is one which appeals to all classes, and the drawing is likely to be the most admired in the exhibition. Commonplace as may be the characters in it, they are preferable to the highwaymen that are fast becoming a specialty in Institute exhibitions.

The President is always chary of occupying much space, and this year his two portraits of ladies and the head called *Anthea*, from their size, run the risk of being overlooked. Flesh and costume are admirably painted, but is it the consequence of seeking so much after solidity in the former that the hair is handled so heavily? Mr. C. GREEN'S *Sir Roger de Coverley* is as careful in execution as any of his past works, and the line of girls is very graceful and English. LEECH could hardly put "Mr. BRIGGS" in a more humorous predicament than is seen in Mr. A. C. CORBOULD'S *A Man's as Young as he Feels*—a heavy-weight pursuing a hunter across a field. Mr. CARLTON SMITH'S *Coming from the Well* has a background of trees that is as delightful as the figure of the girl who so gracefully carries the pitcher. It is the most successful of his three drawings. Mr. EDGAR BUNDY in *Memories* represents an ancient dame—a sort of Countess of DESMOND—seated in a gallery contemplating the family portraits, which are of the stereotyped class. The idea is realised without any straining after effect. There is nothing introduced that would disturb the reverie, and the light which falls on the face seems like an influence which quickens the brain and recalls the past. *Cordelia's Banishment*, by Mr. G. SHERIDAN KNOWLES, might be a representation of a *tableau vivant* at the Institute. It is skilfully arranged, and the characters exhibit the most decorous self-control. But this drawing-room scene has no relation to semi-barbarous Court, and who could imagine the nice old gentleman on the throne had uttered the dread command, "Begone without our grace, our love, our benison"? Mr. A. M. ROSS'S *Music Lesson*—a very large drawing of a girl with a dog before a piano—is undoubtedly very vigorous, but if prepared for any other exhibition it would probably appear on paper one-fourth the size. Mr. STEER'S *Poor Lad*, which suggests the commiseration of villagers for a boy who has met with an accident and is escorted from the surgeon, is curiously real, but not in the French sense. The same love of detail is seen in the trees and ground of the *Touchstone and Audrey*. Mr. DUDLEY HARDY'S *Study in Petticoat Lane* might be a scene in a remote Judenstrasse or Ghetto, and is as telling as if painted in oils.

There are several fine landscapes this year. The single contribution by Mr. B. EVANS, *The Valley of the Wharfe from the Bolton Abbey Moors, Yorkshire*, is a characteristic rendering of as glorious a scene as is to be found in England. The peculiarity of the place is expressed, and the drawing imparts a sense of air and light of an autumn day. Mr. ORROCK'S *Smailholm Tower* is a puzzle. The tower is about as interesting as a builder's pay-box on wheels, but it is represented on so large a scale and stands forth so prominently that we must imagine the painter has had some special motive in selecting so strange a subject. There is a fascination about bewilderment, and the visitor is sure to look more than once on Smailholm Tower, and to wonder why it inspired so big a drawing. The view of *Edinburgh from the Braid Hills* proves that Mr. ORROCK can see an amount of colour in the North that will surprise people who are well acquainted with the scene. Mr. HARGITT has derived three capital subjects from that *multum in parvo* for landscapists, the Isle of Arran. The sombre *Cairn ne Calliach*, and *Black Hill*, and the *Hill Stream* (for the pyramidal rock in the background, we presume, was found in Arran) reveal his skill in painting mountains, and which is not sufficiently appreciated. Mr. FRANK DILLON has a good view of the priory garden at Dunster with its large dove-house. Sussex has, as usual, supplied many of the landscape subjects; in fact more than any of the other counties. One of the best is Mr. A. W. WEEDON'S *Stacking Hay, near Pulborough*, an inland region that is not yet exhausted. The view of Bosham is more varied in its elements. Another view that is worth notice is Mr. WHYMPER'S *In the Quell*. Mr. H. G. HINE continues that series of scenes which never pall on the public mind. His

Beachy Head, Seaford Cliff, and *Lewes* are as faithful to Sussex as any of their numerous predecessors. There is, however, more glow and colour in the view of *Thirlwall Castle, Northumberland*. Mr. JOSEPH KNIGHT'S landscapes do not need much search, for they can be quickly identified. His *Across the Warren* and *Evening Light* could hardly be more effective if they were in coloured relief.

The power possessed by Mr. GREGORY, A.R.A., exasperates rather than gratifies his admirers. The painter of the small *Peveril Point* under other conditions could produce glorious landscapes, for the rocky coast and sea in it are not easily forgotten. But it is not unlikely that years will elapse before we have another chance to admire a seascape or landscape by the artist.

In the east gallery some of the so-called strongest landscapes are hung. Mr. COCKRAM'S *Still Salt Pool* has much originality about the disposition of the parts. Mr. E. G. WARREN'S *Silent Woods* contains many noble trees. Mr. CLAUDE HAYES'S *Winter's Eve* and *Winter*, like his other drawings in the exhibition, are not composed on principles that are generally accepted. They might be imagined to be accidental combinations owing to the care with which the planning is concealed, and the handling, which is so light that it appears very easy work. His drawings are suggestive rather than imitative, and somehow they are unlike any others in the galleries. We do not advise a novice to attempt an imitation of them, for without peculiar skill he is likely to produce something that might well be called an "assemblage confus de l'être et du néant." Mr. NISBET, of Edinburgh, in his *Harrowing*, occupies at least three-fourths of the canvas with sky, and the picture gains by the treatment. His *Moonlit Moorland*, on the other hand, is only sufficiently lighted to make dimly visible the waste and moostroopers who cross it. Mr. P. MITCHELL'S landscapes show no falling-off this year, and, in fact, the delicate treatment is manifest at a glance. Mr. J. NASH, in his *Derelict*, adopts a method that might be considered as opposed to STANFIELD'S in the *Abandoned*. The sea is of the peculiar blue which Mr. H. MOORE loves, but which is not everywhere a characteristic of salt water. The sky is also bright. No doubt it was intended to make the wreck appear more pathetic when seen in the brilliance of a summer day; but whether owing to the influence of tradition or other cause, it seems to us that the old-fashioned way of suggesting the wreck as helpless under a power that was inimical was preferable. TURNER'S *Téméraire* also supports our theory. The sea is calm, and there is a glorious sun, but the noble veteran appears as helpless as if out of its element, for it is dragged as if in triumph by a tug that seems to be the representative of ignominious force.

Views of Venice are numerous this year. Mr. FULLEY-LOVE has no less than eight in which the buildings are shown in a straightforward style, as if their quality was sufficient to secure admiration with the aid of extraordinary effects of colour or dramatic figures. Mr. HARRY HINE has a large view of Durham, which suggests the extent and strength of the buildings; another of Gloucester Cathedral, which is brilliant, and one of Norwich Cathedral, in which the tiled roofs of the neighbouring houses detract from the interest of the building. Mr. A. W. RIMINGTON selects that gateway of the Doges' Palace which seems to be indispensable for all exhibitions in England and abroad. Mr. T. R. MACQUOID'S *Great Square, Carthagera*, is almost refreshing from its novelty, and it is needless to say it is drawn with an appreciation of detail. *A Shoemaker's Window, Arramanches*, is curious, but the *Stable Yard, Normandy*, is prosaic in itself and owes its interest to the mode of representation. Mr. C. EARLE has a view of Stokesay Castle, which can be contrasted with one by Mr. WHYMPER, and a remarkable view of Avignon. Mr. PHENÉ SPIERS'S careful *Street in Hameln* (the scene of the Pied Piper's retributive vengeance) and part of the castle at Heidelberg have interest for others besides architects. Mr. B. DANYELL represents the *Bargello Steps* in Florence. Mr. E. BALE has a couple of views in the neighbourhood of Florence. Mr. HAY depicts the *Belfry of Bruges* more darkly than it appears of a wet day. The formal *Old Workhouse, Chichester*, is drawn by Mr. COULDERY, and when compared with modern buildings of its class gives rise to doubts about social and economical progress.

ST. JOHN, SYRACUSE.

THERE is outside the walls of the city of Syracuse a small church of high antiquity dedicated to St. John. It has been built over a still more ancient place of worship, being a subterranean chapel or crypt, which there is reason to believe was one of those caves resorted to by the early Christians for the celebration of their forbidden rites, when harassed by pagan persecution. Pirro, in his "Sicilia Sacra," relates that in anno Sal. 59 St. Paul stayed three days at Syracuse, where he was received with incredible joy by St. Martianus, the first bishop of that city. According to a tradition, during his sojourn there he dwelt in a cavern which is under the very ancient church of St. John, outside the city walls, and which, it is to be presumed, is the crypt of which a view is given. Pirro adds that Martianus afterwards suffered martyrdom, and was buried in this subterranean part of the church of St. John. The details of early church history which are given by old ecclesiastical writers are often too dependent on tradition to justify their reception as facts. In the present case, however, they certainly afford presumptive evidence of the great antiquity of this crypt, evidence strongly borne out by the existing remains.

It therefore appears that the lower cross, that carved on the corbel, is to be considered as one of the signs of the original consecration of the church. In a Pontifical printed at Rome in 1595, and now preserved in the British Museum, where the ceremony of consecrating a church is set forth at length, the bishop is enjoined to mark with his thumb, dipped in the chrism, twelve crosses on the walls of the church and others on the door, altar, &c. The prints embellishing this Pontifical show the bishop so engaged, mounted on a movable stage six steps high, the rubric requiring that the crosses shall be 10 palms (7 feet 5 inches English measure) above the floor.

On the exterior of this church is a sort of entablature over the door, on which is a rude representation of Doric triglyphs with a cross in the metopes; over this entablature is the strange anomaly of a Pointed arch. The artists of Italy in the Middle Ages seem to have been sadly puzzled in their style; they were so much accustomed to see around them the examples of Classic art, then, of course, much more numerous and perfect than at present, that they came unwillingly, and therefore awkwardly, into the new style, and were the first to apply themselves to the renewed study of the style of their forefathers.

There is nothing else particularly to be remarked in the



SUBTERRANEAN CHAPEL IN CHURCH OF ST. JOHN, SYRACUSE.

It is obvious, from the view of the crypt, that there is much variety in the dates of the several parts. The plain semi-circular vaults forming the ceiling, although repaired subsequently, may be supposed to be the earliest; the ribbed and pointed vaulting beyond is decidedly posterior, and in the foreground of the sketch are a few indications of modern work. It will be observed there are some stones carved in almost Classic style, which form part of the piers supporting the vaulted roof, and which, from the manner they appear let into the wall, must have belonged to some previously existing work of, however, Christian builders, for there is carved on one stone an eagle with the nimbus round its head, which bird, as the lion was the representative of St. Mark, appears to have been the emblem of St. John the Evangelist, to whom this spot is dedicated. On another piece of sculpture are seen two smaller birds amidst foliage, which may have been intended to represent doves, symbols of Christian love, often seen upon monuments of the earliest ages of Christianity.

The plain cross cut on the face of the corbel on the left hand is peculiarly interesting; near to it is an inscription, of no great antiquity, to the following effect:—"Crux superior recens cæteræ vero antiquiores sunt, et antiquissimi consecrationis signa referunt templi hujus, quo non habet tota Sicilia aliud antiquius."

exterior of St. John's, except the enriched rose-windows, a form of window frequently met with in the architecture of the Middle Ages throughout Italy.

JAPANESE ARCHITECTURE AT CHICAGO.

ONE of the great benefits to be derived (writes Mr. P. B. Wight in the *Inland Architect*) by the city of Chicago from the World's Columbian Exposition will be a permanent building (or rather group of buildings) now being erected at Jackson Park by the Japanese Imperial Commission, illustrating not only the old architecture of Japan, but the exact method of construction employed in that country during the best periods of its arts, ranging from four hundred to eight hundred years ago, according to some authorities. For it is held as well by modern Japanese experts no less than by connoisseurs who have made a study of the architecture and decoration of that wonderful country, that its greatest development in this direction was during the period mentioned, corresponding with the later Byzantine and Romanesque and the earlier Mediæval periods in Europe.

The modern buildings of Japan—that is, those erected before commercial relations were opened with America and

Europe in the present century—beautiful and exquisitely constructed as they may appear to our eyes, are not considered by the Japanese themselves to be examples of an indigenous style. All modern building in Japan has been subjected to a Chinese, and possibly a Korean, influence. I am assured by the Japanese Commission that the buildings erected by them on the Centennial grounds at Philadelphia in 1876 were of this character. Those who saw them will remember the solid construction, perfect fitting and artistic carvings of these buildings, which were then greatly admired. But it has been the desire of the present Commission to illustrate the architecture of Japan as practised in its "palmy days." Not only the methods of building, but the style of decoration employed at that time, are now subjects of study in the Imperial Academy of Fine Arts at Tokyo. This Academy, which, when founded, was devoted to studying the arts of modern Europe, has found a mine of wealth in its own country, and the fear that was expressed by lovers of Japanese art in America and Europe, that the Japanese might discourage their own arts by endeavouring to import those which are not indigenous to them has been dispelled. These buildings will be built to demonstrate this fact.

The construction work is being done by the most skilful mechanics that could be found in Japan. All the material has been worked and fitted during the past summer, and has been transported to Chicago at great expense. It could have been taken the entire distance by sea to New York and then sent by rail to Chicago for less than it has cost to bring it by the direct route by steamer to San Francisco, and thence by rail to its destination. But time in this case was more important than economy in money. The buildings will be completed and decorated in time for the opening of the Exposition. Hundreds of men have worked on them in Japan during several months past, and all the parts have been accurately fitted together, so that only twenty-four men are required to perform the actual construction. Soon a larger force of artists and decorators will come to complete the work, and gardeners will surround the palace with wonders of horticultural art, the result of the traditions and experience of a thousand years, handed down from father to son.

The work of decoration will be performed by the students of the Academy of Fine Arts of Tokyo. It is well known that the excellence of all the arts practised by the Japanese is due to the fact that all trades and arts are hereditary, and shopwork is hardly known; but artists work in that country singly and in their own homes where the sons learn their art from the fathers. Such men are not archæologists. It is nothing to them what the ancients did. But they know that what their fathers did was well done, and they are content to do it again as well or better if possible. When the old decorations became matters of study in the Academy, there were no artists to reproduce them in the old way, and the hereditary artists (so to speak) would have botched them in attempts at reproduction. Hence the students and graduates have undertaken to execute the decorations of the interior of the palace. Many of them are on panels, and have already been completed in Japan.

The whole of the work is being carried out under the direction of Mr. Kuru, of Tokyo, a graduate of the Imperial University of Japan, who has practised architecture in his own country for several years, much as our own architects do, and now comes to America for the first time. Mr. Kuru is also an artist in many other ways. In Japan the practice of architecture as a profession is of course something new. Japanese buildings in the indigenous styles required no architects. Builders in Japan, like potters and metal workers, are born to the trade, which they inherit from their fathers. They are draughtsmen and designers, in their own way, as much as they are contractors. But the changes in customs and government have called for buildings more like those of America and Europe. Hence educated native architects have been called into being. Mr. Kuru, when at home, is engaged mainly in designing government school buildings.

In addition to the palace on the wooded island, he will have charge of the erection of the Japanese Tea House, east of the Manufactures building and fronting the beach, the materials for which have all been prepared and are now on the way from Japan. He is now preparing in Chicago the designs and working drawings for the Bazaar, which is to be built on the Midway Plaisance. This will be built in the modern Japanese style. The materials will not be sent from Japan, but our own materials will be worked into it by Japanese mechanics as soon as the palace is well under way.

Meanwhile the happy group of imported workmen are putting their materials together on the island, making hardly a sound with their work—for there are but few nails in this building—but making the park resound with their happy songs. Happy and contented are they, though they be contract labourers, and have no unions behind them nor walking delegates and committees to rob them. And they are literally "imported contract labourers," yet whom no meddling labour agitators with jealous eye can disturb or make afraid, for Congress has made an exception of men working for foreign

governments at the Columbian Exposition, and the Secretary of the Treasury has said that it is all right. They work and talk and sing. When a few are together they talk incessantly. When many work together on some laborious undertaking they chant wild songs something like those of our sailors. I am told that they are comic songs and witty sayings. These stimulate them to greater exertions. They laugh at each other's jokes, unmindful of all else that surrounds them, and are happy. They are doing the work of their brilliant emperor whom they love, and are contented. They comprise all the classes of craftsmen that work on buildings, and labourers as well. If the labourers want help, the tradesmen take hold without violence to their dignity and perform menial work without complaint. Their stonemasons work without chisels, doing all kinds of work with a great variety of hammers having edges as sharp as knives and a ring that attests the fine quality of the steel. I saw a solitary old stonemason, who had been employed to help them break up stones with plug and feather, but not to cut. They did all of that with their little hammers. He was a union man, and I wondered if they came into his category as "scabs"; or was he innocent of the thought that these men worked at his own trade, and that association with them subjected him to severe penalties?

But let us return to the story of how and why this ancient palace comes to us from afar. From an architectural standpoint it is perhaps the most interesting contribution to the Exposition. For it is not set up as an imitation, but is what it pretends to be, a genuine product of materials and labour that has never before been seen on this continent.

The general plan of the exhibit was determined by the Imperial Commission, after studying the ground and preparing many sketches. It was finally decided to erect a palace such as those occupied by the Shoguns of the Mediæval period and to use three types, following the designs of ancient buildings, now existing and combining them into a general plan which would comprise a body and two wings. They therefore concluded to call it Hōden (Hō-ō-den, three syllables).

The general form is that of a temple. From this it has got abroad and been repeated in the daily papers that the building is to be a reproduction of one of the ancient temples of Japan. On the contrary, as has been said before, it is a palace but has the general form of a temple. Each of the separate buildings and all of the details are copied from palatial buildings. The temple at Hei-to-in at Wugi has two wings connected with the main building by corridors or peristyles, and there is a small extension in the rear of the main building. It is called Hō-ō. Hei-to-in is an enclosure or park devoted to the worship of Buddha. It is near Saikyo, the ancient capital of Japan, where the Shoguns formerly resided. Hō-ō-den means a palace whose ground plan bears a general conformity to the outlines of a flying bird. Hō-ō is a mythical bird somewhat resembling, and possibly the same as, what is known to us as the phoenix. It is supposed by the Japanese romancers to have a star on the head indicating the astronomical period of its appearance, and to have visited Egypt every five hundred years, and Arabia, China, and Japan periodically. Chinese literature reveals the tradition that this fabulous bird was only seen when the people had a great and good emperor. Among the Japanese the Hō-ō is supposed to be a sacred bird who is always associated with the glories of the great emperors of Japan in the olden time before the Daimios made practically prisoners of the legitimate dynasty, and put the Shoguns on the throne.

The plan selected for the building is well adapted to the site. The principal front is to the east, facing the rising sun, while the other sides differ from it very slightly. There is great simplicity in the arrangement, but the effect depends upon the exquisite delicacy of the details of carving and colouring, of which the working drawings give no adequate suggestion.

TESSERÆ.

Greek Temples.

TEMPLES appear to have existed in Greece from the earliest times. They were separated from the profane land around them, because every one was allowed to walk in the latter. This separation was in early times indicated by very simple means, such as a string or a rope. Subsequently, however, they were surrounded by more efficient fences, or even by a wall, *erkos*, *peribolos*. The whole space enclosed in such a *peribolos* was called *temenos*, or sometimes *ieron*, and contained, besides the temple itself, other sacred buildings, and sacred ground planted with groves, &c. Within the precincts of the sacred enclosure no dead were generally allowed to be buried, though there were some exceptions to this rule, and we have instances of persons being buried in or at least near certain temples. The religious laws of the island of Delos did not allow any corpses to be buried within the whole extent of the island, and when this law had been violated, a part of the island was first purified by Pisistratus, and subsequently the

whole island by the Athenian people. The temple itself was called *naos*, and at its entrance fonts were generally placed, that those who entered the sanctuary to pray or to offer sacrifices might first purify themselves. In the earliest times the Greek temples were either partly or wholly made of wood, and the simplest of all appear to have been the *sekoï*, which were probably nothing but hollow trees in which the image of a god or a hero was placed as in a niche, for a temple was originally not intended as a receptacle for worshippers, but simply as an habitation for the deity. The act of consecration by which a temple was dedicated to a god was called *idrusis*. The character of the early Greek temples was dark and mysterious, for they had no windows, and they received light only through the door, which was very large, or from lamps burning in them. Vitruvius states that the entrance of Greek temples was always towards the west, but most of the temples still extant in Attica, Ionia and Sicily have their entrance toward the east. Architecture in the construction of magnificent temples, however, made great progress, even at an earlier time than either painting or statuary, and long before the Persian wars we hear of temples of extraordinary grandeur and beauty. All temples were built either in an oblong or round form, and were mostly adorned with columns. Those of an oblong form had columns either in the front alone (prostylos), in the fore and back fronts (amphiprostylos), or on all the four sides (peripteros). The friezes and metopes were adorned with various sculptures, and no expense was spared in embellishing the abodes of the gods. The light which was formerly let in at the door was now frequently let in from above through an opening in the middle, which was called *upaithron*. Many of the great temples consisted of three parts:—(1) The *pronaos*, or *prodomos* (the vestibule); (2) the *cella* (*naos*, *sekos*), and (3) the *opisthodomos*. The *cella* was the most important part, as it was, properly speaking, the temple or the habitation of the deity whose statue it contained. In one and the same *cella* there were sometimes the statues of two or more divinities, as in the Erechtheum at Athens the statues of Poseidon, Hephaestus and Butas. The statues always faced the entrance, which was in the centre of the *prostylos*. The place where the statue stood was called *edos*, and was surrounded by a balustrade or railings. Some temples, also, had more than one *cella*, in which case the one was generally behind the other, as in the temple of Athena Polias at Athens. In temples where oracles were given, or where the worship was connected with mysteries, the *cella* was called *aduton*, *megaron* or *anaktoron*, and to it only the priests and the initiated had access. In some cases the *cella* was not accessible to any human being, and various stories were related of the calamities that had befallen persons who had ventured to cross the threshold. The *opisthodomos* was a building which was sometimes attached to the back front of a temple, and served as a place in which the treasures of the temple were kept, and thus supplied the place of *thesauroi*, which were attached to some temples.

Granites.

There are not more difficult materials to work with than granites; indeed, for centuries the architect rather shunned the strong material. Science, however, has come to the rescue, and by mechanical help great results are now obtained from the most refractory rock. While labour (that of slaves) cost nothing, granite, in early history, was selected for the images of gods, the tombs of kings, for their statues and temples, and for monuments of great events. Indeed, it was always employed in the erection of monuments that were intended to last for ages. In their choice of granite for these purposes the Egyptians were not mistaken. To this day the monuments of Egypt, nay, the hieroglyphs on their bases, are almost as fresh as if just from the sculptor's chisel. The cost of working, however, is still great, but as this cost decreases, as in time it must, we shall see more of it used in architectural work; not in the servile manner in which it is now the fashion to employ the red granite of the north, but in numberless instances where the wind and rain beat, and where it is so admirably adapted to withstand these influences. In this way it might prove a permanent and enduring assistance to buildings composed in other parts of more perishable materials. Granite can now be obtained of so many different shades of colour that any building stone can be found to harmonise with it easily. The sculptor has tried to employ granite in his art, but its mottled appearance and often faulty composition are sadly against it for his purpose. It is needless to quote churches and buildings in this country in which granite has been employed in past ages. Nearly all of them show no symptoms of decay, but in some instances disintegration or decomposition has taken place, and this from the selection of unworthy examples of stone, for it appears that there are some granites no more proof against the weather than the poorest limestones. Hard and compact as granite appears, it is, nevertheless, sufficiently open and porous to admit a considerable amount of moisture. By absorption it will take up nearly $1\frac{1}{2}$ per cent. of water, and where disintegration takes place it is owing mainly to this circumstance. In all stones that admit water and all do frost

employs its terrific force and separates particle after particle till the surface is destroyed. Water conveys the chemicals which exist in the air to the interior, and by its solvent power, due in a great measure to the carbonic acid it contains, decomposes all stones. To judge of the great power exercised by carbonic acid as a solvent, it may be mentioned that all the silica that exists in the vegetable world (and no plant can grow without it) is derived from the stones and flints of the earth, and absorbed by the microscopic capillary cells in the roots, but the solid silica could not pass through these cells and water, we know, will not dissolve flint. How then is it to be accomplished? The rain that falls collects the carbonic acid of the air, and acquires the same from the soil through which it passes, and in combination therewith it dissolves the flinty rock and stone, and thus conveys the necessary support to the roots of all vegetation. In the selection of granite for enduring purposes those in which the constituent minerals are most evenly proportioned are the best. Like small paving-stones each particle seems to help the other, and the smaller the grain the more completely is this the case. Large crystals of feldspar are always objectionable on account of their readiness to decompose. For ornamental purposes almost any granites are available, many affording very rich combinations of colour, and if the surface be polished the weather has less hold upon it and it lasts longer. If granite be totally submerged in water and never exposed it will last unimpaired for ever, thus showing that water alone, without the agency of the air and decrease of temperature to the freezing-point, will not materially affect it. The feldspar of granite is the most likely to decay.

Early Water-Colour Painting.

It has been frequently asserted that the English have no native taste for art, and judging from the early history of art in this country there would seem some ground for the assertion. In the beginning of the last century painting was in the hands of foreigners, who came to reap the harvest it afforded, our own people gathering but gleanings left upon the field; and although there were works by native painters of merit, these were rather pupils and followers of the greater Italians and Flemings that, from the time of our last Henry downwards, were the painters of our kings and princes, and the skilled decorators of their palaces, than holding any decided rank of their own. But from the earliest time there was one branch of art in which English artists had a reputation even on the Continent, and in which they certainly excelled the artists of other nations, namely, miniature painting in water-colours; and any one who is acquainted with the beautiful works of that kind by Hillyard, the two Olivers, Hoskins, and Cooper, will be aware that this statement is strictly true. Their art had its origin no doubt in missal painting, in which the colours were either opaque in themselves, or mixed with white in order to render them so; and the miniature painters continued a modified use of the materials and methods of the missal painters, tending, however, to a use of more transparent pigments. Yet even miniature painting had declined from its palmy excellence in the days of Queen Elizabeth and the Charleses, and fallen, like other art, into mere copying from the works of more gifted painters. The use of opaque pigments, tempered or mixed with water and some glutinous substance, hence called *tempera paintings*, extended to other branches of art besides portraiture, but it was of that solid and opaque kind which is still practised by the scene painter, white being mixed with all his pigments. Some of the artists who wrought in this manner were men of repute. Walpole, the chronicler of our native art, speaks in high terms of praise of George Lambert, the scene painter, and of Taverner, who was rather an amateur than an artist, some of whose works, according to Walpole, might be mistaken for Gaspar Poussin's. But, besides this method of painting, there was still another kind, called stained drawing. The whole drawing was carefully wrought up in Indian ink, and when thus completed a few tints representing local colour were thinly added over the various parts. This branch of the art, as followed at the end of the last century, was topographic rather than artistic. Sometimes the practice was a little varied as far as the first process was concerned, the whole work being carefully drawn in with the pen before the last colour tinting was added; and this use of the pen, frequent in the works of Hearne and Rooker, is to be noted, since it was developed into a means of great expression and beauty in after-times in the hands of Prout and Nash, who made it valuable in the delineation of buildings and architecture.

Correction of Optical Illusions.

The same niceties that form one of the charms of Greek sculpture are equally observable in the *chefs-d'œuvre* of Greek architecture that have survived for our study and instruction. Perhaps it would be difficult to cite a more remarkable instance than the entasis of the shaft of a Greek column. It was found that, owing to some optical illusion, the shaft of a pillar of which the sides are parallel appears to be larger at top than at bottom, and such appears to be the case in the remarkable Egyptian example at Beni Hassan, which has often been

referred to as the prototype of the Doric order. To remedy this defect, the Doric architects diminished their shafts upwards of about one-fifth of their bottom diameter. But then, owing to some other optical illusion, it was found that where the sides of the arch were diminished in straight lines from the bottom to the top, those sides appeared to be slightly concave; this gave rise to the adoption of what is called by Vitruvius the entasis, by which expedient this disagreeable *deceptio visus* was at once obviated. This has always been known, but it has been found that even this expedient was not sufficient fully to satisfy the excessive refinement of the Greek eye, and that the boundary line of the Doric shaft, in the best examples, was made not merely a convex line, but a part of a true hyperbolic curve, a hyperbola, no doubt, of an extremely small axis minor, but, nevertheless, a hyperbola drawn with exact mathematical accuracy. Here is an instance of the extreme delicacy and fastidiousness of Greek taste, and an evidence of the value attached by the Greeks to what probably appears to most of us to be a very trifling matter. The later imitators of the Classic style saw this entasis, but, being utterly unable to feel as the Greeks felt, they presumed that all they had to do was to swell the shaft, and so they swelled it, but to such a preposterous extent that, as Evelyn quaintly observes, their columns appear to be sick of a tympany. A similar evidence of nicety of taste is presented to us in the mathematical precision with which the Greek echinus is curved. The artists of that period were not content with an ordinary and simple curve, which might have satisfied a less sensitive taste, commencing the contour with a straight line and gradually giving the upper part of it a curvilinear form resembling that of the natural echinus. There is another instance of the really wonderful delicacy of the Greek eye. Most students who have looked over the pages of the earliest expounder of the laws of architecture—Vitruvius—used to be sadly perplexed by the instructions given touching the *Scamilli impares* in a Greek order. Mr. Penrose has shown that the course of masonry forming the base line on which the columns of a Doric portico were placed was studiously laid with its upper surface very slightly but appreciably convex; and though Vitruvius, on laying down this rule, does not give us the reason for it, yet there can be no doubt whatever that, like the other minute observances of the Greek masons, the *Scamilli impares*, which were the result of this very peculiar mode of construction, were intended to correct an optical illusion similar to that which the entasis of the column shaft was intended to correct, thus furnishing another illustration of the extreme fastidiousness of these accomplished art-workmen. It is in like manner shown by the measurements of Mr. Penrose that the soffit of the entablature is executed with a very faint concavity. We can well understand the motive for this. Every one will have observed that, through some visual deception, any large surface of flat ceiling appears depressed towards the centre; such an effect on the eye was sure not to have escaped the observation of Greek builders, who adopted this natural mode of correction. One other illustration of their fastidiousness is seen in the faint concavity which was wont to be given sometimes to the facettes of a Doric triglyph. The motive for this concavity may be readily surmised to be a wish to render the drawing of those triglyphs distinctly perceptible, without resorting to too deep or sharp indentations, which might by their shadows have interfered with the effect of sculptured metopes, and detracted in some degree from their breadth and effect, that quality which is one of the distinctive charms of all Greek art.

Glass among the Anglo-Saxons.

We learn from Bede that the art of making glass was unknown in England, even in sheets for church windows, till about A.D. 680, when St. Benedict, Abbot of Wearmouth and Jarrow, "misit legatorios Galliam, qui vitri factores, artifices videlicet Britannis eatenus incognitos, ad cancellandas Ecclesias, porticumque et cenaculorum ejus fenestras, adducerent. Factumque est, et venerunt. Nec solum postulatam opus compleverunt, sed et Anglorum ex eo gentem hujusmodi artificium nosse ac discere fecerunt." We may hence safely infer that whatever knowledge of the art the Saxons may have once possessed was extinct before Bede's time, though it was still existing for the manufacture of sheet glass in France, and perhaps also in Italy. The art of glass-making is enumerated among other secrets of the eighth century in a very curious and ancient Lucchese MS., referred to by Muratori. Certainly one would suppose this art far more likely to have survived in Italy, the seat of the arts, than in any Ultramontane region; and yet the circumstance of the famous green glass dish of St. Peter's, passing in the belief of the faithful for an emerald patina, a holy relic of the Last Supper, would seem to attest the excessive rarity of glass—at least, in the form of vessels. It had long been manufactured for church windows; yet glass vessels were still sufficiently rare and valuable for a German emperor to select from his treasures as a present to a French saint. What, then, are we to think when we meet with vessels of elegant form, delicate material

and difficult construction interred, hundreds of years previously, in Saxon and Frankish graves? Nothing can warrant a suspicion that such vessels are of direct Roman manufacture; but this expiring Roman art may have lingered awhile as a mystery in some early Teutonic hands: "excedens terris vestigia fecit." That the Anglo-Saxons must have had a tolerable acquaintance with the art of glass-making has already been seen. We may further observe they were able to apply it to the glazing or vitreous coating of objects, as appears from specimens of the beads. How, with the instruments we may suppose them to have possessed, they succeeded in cutting deep beds in the larger glass beads as ornamented matrices to receive the coloured composition, or how they so accurately squared the many planes of the crystal amulets, yet remains to be explained. It is also clear they knew enough of chemistry to enable them to impart various colours to their glass, and compound and colour the pastes and enamels employed in the inlaying process, which are so durable as sometimes to have survived when the object they served to ornament has become decomposed.

Coloured Materials.

Whatever colours may be used, they should not be so used as to detract from the harmony and unity of the general effect. For this reason violent contrasts are seldom attended with good results; when such strongly-marked contrasts are not offensive it is when they are uniformly spread over a whole composition. Thus, when in a red brick building stone dressings are used throughout for the quoins, window jambs, cornices, strings, &c., or when on an exterior of red bricks there are reticulations of black bricks over all the plain surfaces, these strong contrasts of colour do not offend the eye, because of the intimate and general intermixture of them; the only effect is that in the one case the light stone dressings lighten the effect of the building, and in the other case the dark reticulations being disseminated over the whole lower the tone without disturbing the unity of the building. But scatter those white stones or black bricks here and there sparsely and at intervals over the front, and the general effect will assuredly become spotty and disorderly. In the distribution of coloured materials regard should be had to the retiring and advancing qualities of colour. Thus white and bright yellows and bright reds appear to stand forward, whilst black, blue and greys retire. Care should be taken not to outrage these prejudices of the eye; for example, when dark and retiring colours prevail at the lower parts of an architectural composition, and the upper parts are of bright-coloured materials, the latter will inevitably appear to advance and overhang the former, producing a false effect that cannot be agreeable. So when buttresses are built of a darker stone than the intervening wall they seem to sink into instead of advance from the face of the wall, and the eye gets puzzled and offended, for an effect is produced at variance with what we know to be the fact. For the same reason a bad effect is produced by a black marble frieze introduced in an order built in other respects of light-coloured materials. When viewed at some distance, or with half-closed eyes, the cornice seemed suspended in the air, or at all events the means of its support were not obvious, and generally we may regard it as a rule in matters of this nature that constructive doubt and uncertainty produce an unpleasant impression, like that produced by the concealment of the feet of figures in a picture. So also dark marble columns in front of a light wall, unless brought out by polish or by a considerable depth of shadow behind them, lose that prominence and æsthetic value which should belong to them. Reverse the arrangement and all ambiguity vanishes; each part then takes its right place in the composition, and the eye consequently rests satisfied. It ought not to be necessary to dwell on a principle that appears so obvious, but it is too certain that the principle, obvious as it may be, is often lost sight of. Special care is needed in the introduction of dark bands and other features of like nature that they do not interfere with the architectural shadows of the composition. Nothing perhaps in architectural design is more important than to preserve its outlines and masses distinct and unambiguous, and as those outlines and masses are best brought out and rendered intelligible by shadow, whatever interferes with the due force of those shadows must detract from the effectiveness of the work. There is great danger in using dark streaks and chequered courses, lest the shadows of the building in which they occur should lose their value. For when not seen so near as to allow of a clear perception of details, these bands are hardly distinguishable from shadows. However easy it may be to cite old examples as a justification, reason ought ever to prevail over precedent. These zebra stripes occur in many parts of the peninsula of Italy and in Spain, as well as elsewhere in Europe and in the East. They may have originated in some constructive requirement, no doubt adding to the strength of the wall. We have no such valid reason to urge in favour of our dark streaks; at all events they constitute one of those eccentricities of the past which scarcely deserve to be disinterred.

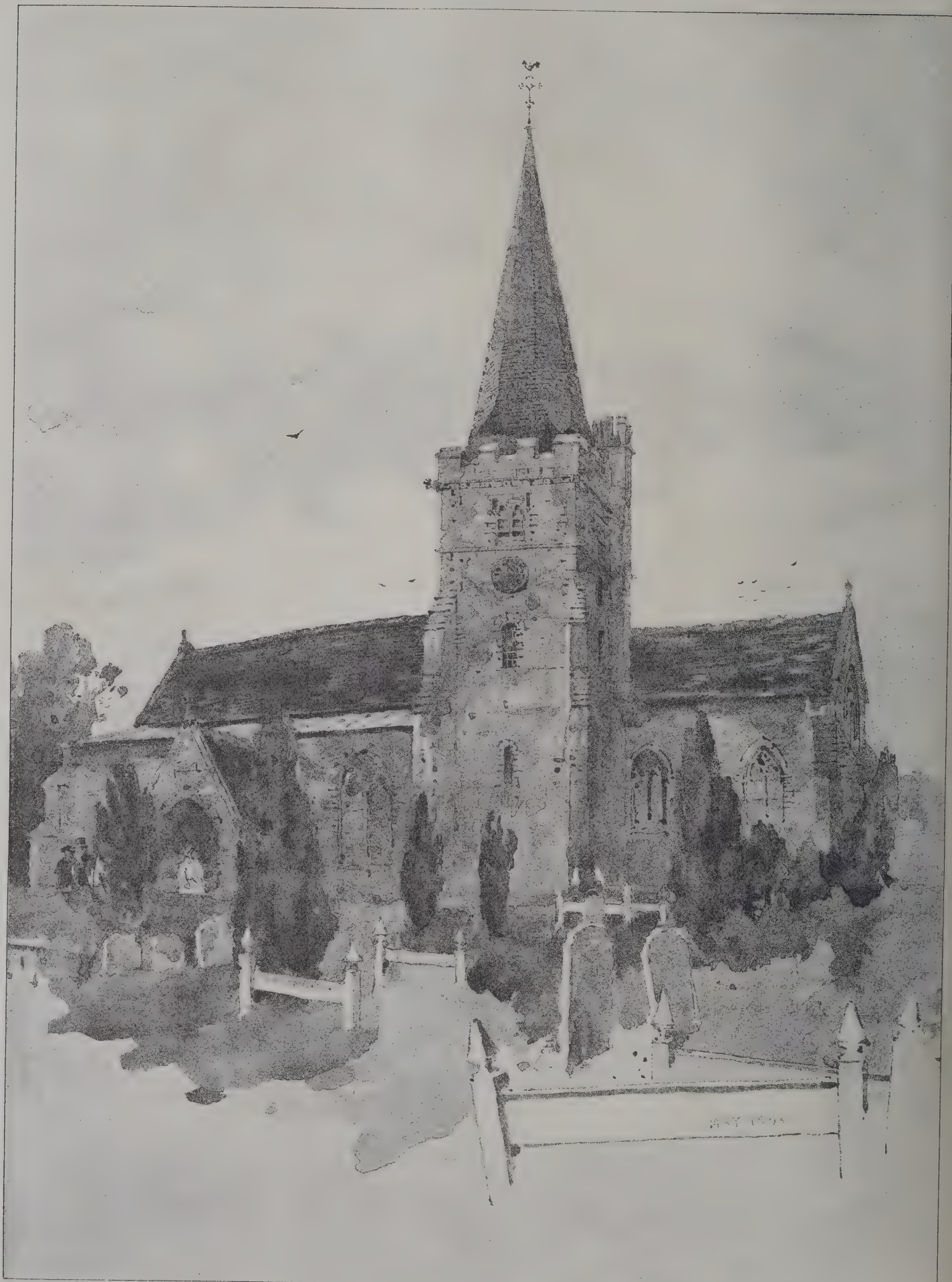
The Architect, March 17th 1893.





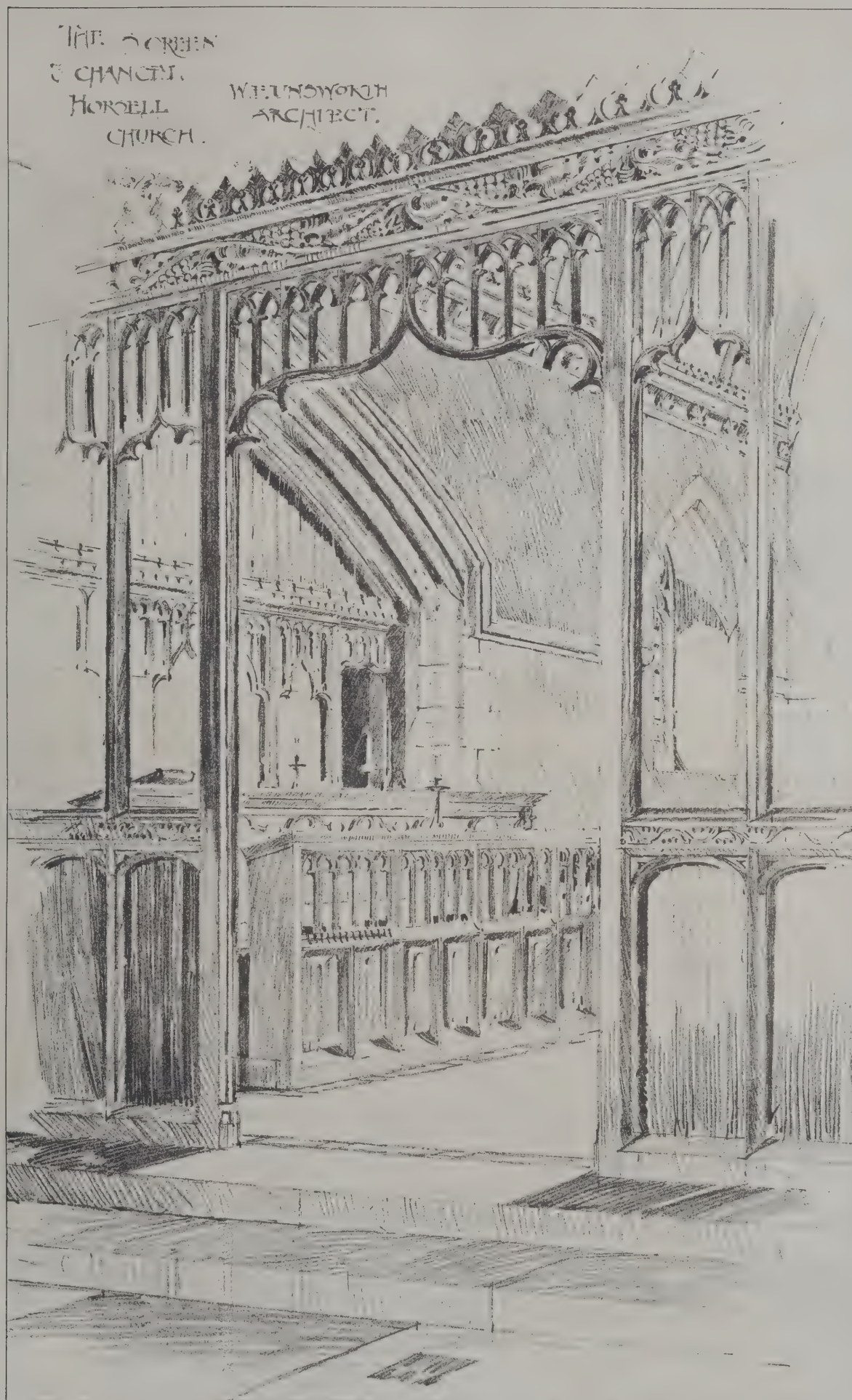
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"HALTON," HERTS.—WINTER GARDEN.
The Seat of ALFRED DE ROTHSCHILD, Esq.



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ST. PETER'S, BURNHAM.
W. F. UNSWORTH, Architect.



THE SCREEN AND CHANCEL, HORSELL CHURCH.
W. F. UNSWORTH, Architect.



17th 1893.



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AT HEIDELBERG.
L. PROUT.

ILLUSTRATIONS.

HALTON, HERTS—WINTER GARDEN.

ST. PETER, BURNHAM, BUCKS.

THE tower of this interesting church was, until lately, covered with plaster, upon the removal of which several Norman windows were found, which have now been opened out. The buttresses and upper portion date from the fourteenth century, the shingle spire being entirely new. The west and several of the aisle windows, which are good specimens of Decorated work, have, with the tower, been carefully restored by Mr. W. F. UNSWORTH, F.R.I.B.A., the contractors being Messrs. NORRIS & SONS, of Sunningdale, Ascot.

ST. MARY, HORSELL, SURREY.

THIS church has been lately restored, and a new chancel built from designs by Mr. W. F. UNSWORTH, F.R.I.B.A. The contractors were Messrs. GODDARD & SON, of Farnham. The carving to misericordes and elbows of stalls and to screens, &c., is by Mr. J. HITCH, of London. The sketch from which illustration is taken shows chancel screen and stalls.

PART OF THE CASTLE AT HEIDELBERG.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Association was held on Friday evening, Mr. H. O. Cresswell, president, in the chair. Mr. A. H. Colquhoun was elected a member. A vote of thanks was passed to Mr. John Belcher in connection with the visit to the new Institute of the Chartered Accountants.

Mr. G. H. FELLOWES PRYNNE read the following paper:—

Screens: their Treatment and Symbolism.

Fascinating as is the study of isolated details of our art, it is not without distinct dangers. The chance of living near, or otherwise being brought in contact with, some one beautiful feature or detail, naturally and healthfully inspires an interest which leads to careful study of the subject, which may in turn lead to the most helpful enthusiasm, but which becomes a danger and a pitfall to the grander conceptions of architectural design as a whole, if it is allowed to end in a hobby. Therefore, in choosing a detail I do so not because it is simply a hobby, but because it is a subject that I hope may not be so often ignored as it has been, but that screens may be treated as one of the great means by which our temples may again become more and more beautiful.

In the short time I have before me I must confine myself to church screen work solely and chancel screen work in particular. In doing so I must say at once that the subject is so large a one and comprises such a vast amount of detail that it will be impossible for me to go minutely into the matter or to give more than a general outline of historical facts, and humbly to offer such suggestions in treatment as may perhaps be found useful to the younger members of the profession at least, when they are called upon to use their abilities in the highest and noblest objects of design, the beautifying of God's house and the furniture thereof.

It may be inquired why it is I have in heading my paper connected the treatment with the symbolism of screens. It is simply because I consider them inseparable. Most undoubtedly screens were originally called into existence for useful as well as symbolical reasons. Their natural usefulness is at once apparent for enclosing spaces, either with the object of preventing unnecessary intrusion or for sake of actual protection. Their symbolical use is not less apparent; that is in marking off and shielding a portion or portions of a building which are held to be places of special honour or specially the spots where the most sacred mysteries of the Christian religion are offered, and in the case of chancel screens they symbolise the division between the life here and the life hereafter, or the separation between the higher and lower estate. And again, when passing under the Holy Rood it is intended to remind one that we cannot attain the highest blessings of Heaven without first passing under the shadow and sorrows of the Cross, or the passing from the Church Militant through the suffering of Calvary to the Church Triumphant.

From the earliest times and in all kinds and stages of religious worship have screens of one kind or another been used to mark off especially honoured spots. In the Jewish Church I need hardly point out that the holy of holies was the place where the priest was alone allowed to enter, and the worshippers had to be content in knowing that the high priest was pleading the great typical sacrifice on their behalf.

Although under the new dispensation all were allowed to be admitted to be partakers of the fruits of the Atonement, and to join with the priest in divine worship, yet is it to be thought for one moment that when the great fulfilment of the antetype had

been consummated on Calvary, that the early followers of Christ should view with less honour the places where the great Christian memorial sacrifice was to be offered to the end of time?

Certain it is, however, that it was this reverence that led the early Christians to adopt the screen. The presbyterium or choir and sanctuaries were separated from the rest of the building either by marble, stone, metal or wood screens or balustrading, not necessarily as high as those of later date, but seldom less than 4 feet or 5 feet from the nave floor level. In the decrees of the Second Council at Tours, in 557, it is ordered that "lay persons are not to enter the chancel, which is divided off by screens, except to partake of the sacrament of the altar."

Old decrees and early writers still speak of this portion of the church as the holy of holies. The altar was even veiled in some cases, and in the Eastern Church veiling is still the custom. In fact, history, ancient writings and architecture itself all go to prove that it is simply a plain matter of fact that in the earliest and purest ages of the Church, chancel or altar screens were considered to be a very essential part of the furniture of a church. It is left for the highly enlightened and intellectual brains of these latter centuries to find or imagine something wrongful and superstitious in this useful and beautifully symbolical feature.

Yes, in these enlightened days, if a faculty is wanted, one often has either to omit the screen altogether or carefully to omit showing the gates, and, if shown, one has to plead they are for safety. If you have not already learnt from sad experience, you would hardly credit how small and vexatious are the quibbles raised by the present day chancellors; they seem to put on their Popish spectacles and see Popery in every detail.

In the ancient planning of chancels, stone pulpits or ambones, similar to those shown on some of the sketches and photographs on the walls, were placed on either side of the lower end of choir. The walls of these ambones often formed a kind of screen in themselves, and in some cases they were designed as part of the screen, as in the churches of the Frari, Venice, SS. Nervi Achille, Rome, and St. Miniato, Florence. The epistle was read from the southern and the gospel from the northern ambones. These pulpits were also used for chanting the lessons and other portions of the divine office.

The date of the introduction of rood lofts is not known exactly, but they are of considerable antiquity. It is more than probable that the first suggestion of the rood beam seen in many churches arose from two circumstances—first, the general use of tie beams, and second, the common and early custom of suspending a large cross in a prominent and central position. The combination of the two is, I think, the most natural suggestion to the mind.

Be that as it may, rood screens and lofts of large dimensions were used at an early date, as that of St. Sophia, at Constantinople, was large enough for the crowning of emperors to take place in it, and in Rheims Cathedral the French kings were crowned in the rood loft. Altars were sometimes erected in lofts at the foot of the rood.

The larger rood lofts are generally ascended by two staircases, carried up either in circular turrets on either side, or in the thickness of the walls.

These staircases often became quite a feature, as in the examples of Exeter and other cathedrals. In foreign examples staircases often go up in the thickness of the screen, as at Metz and Toul, and the church at Oberwessel (illustrated by one of Mr. Millard's sketches).

The earliest screens, however, were undoubtedly of less massive and pretentious character than the rood lofts to which I have just referred.

It was with the gradual growth of community life in the Church that the necessity for more distinctive and solid screens began to be felt.

In cathedrals, abbeys, collegiate and conventual churches, which were originally used by large numbers of ecclesiastics, something more than a low wall or an open grille became absolutely essential for the repose and comfort of those who were compelled by the nature of their long devotional offices to remain so many hours in the church. Churches in those days were not heated by hot-water, steam, and hot-air. Kneeling was not interfered with by small or large-bore pipes running under one's seat. The passages were not then adorned with cast-iron gratings, and one might leave or enter the church without the creaking and rattling grating proclaiming the fact to the whole church that you were on the move. Still, without these innovations, the fact remains the churches were not so comfortable, and to make devotional offices possible some protection from the cold draughts became positively necessary. Even at best, screen or no screen, on cold days it must have been many degrees removed from what we in this nineteenth century consider comfortable. It makes one feel that there is a truer ring about the devotion of these early Christian worshippers. It was, indeed, the case in those days that the words of the Psalmist were fulfilled, "From the rising up of the sun to the going down thereof."

Again, we must remember that the nave, transepts and

aisles were continuously thrown open to the lay worshippers who came in and out at all times of the day, and whose continuous moving about would have been most distracting to those saying their offices in the church.

The general form of the great rood screens was in three, five, or seven bays, and in England the divisions are sometimes more numerous, as at Lincoln, York, Ripon, and other cathedrals. Parochial altars were generally placed on the nave side of the screen. On festivals and occasions of high services the epistle and gospel were read with great solemnity from the rood loft, and so that all on both sides of the screen should be able to join the service; choirs were sometimes also placed in this position.

The dignity of reading the gospel in this way at the foot of the great cross or crucifix appealed to the devout imagination of the worshippers of those days, and as a consequence we see, in the fourteenth, fifteenth, sixteenth, and even seventeenth centuries, rood screens erected in hundreds of parochial churches.

The one central idea was, of course, the elevation of the cross. That the first thing seen on entering the church should be the great and glorious symbol of the Christian faith (a symbol that, shame to say, we have often to hunt for, and in some cases to hunt for in vain in our churches); that those looking on the cross might, in the words of Wordsworth, say:—

Mindful of Him Who in Orient born
There lived, and on the Cross His life resigned;
And Who, from out the regions of the morn,
Issuing in pomp, shall come to judge mankind.

It may be safely asserted that in almost every church up to the end of the sixteenth century there was a screen of some kind or another, and that nearly all had the holy rood set up either on the screen or some equally conspicuous place. The word rood, perhaps I need hardly point out, is taken from the Saxon word "rude" or rood, meaning cross. The rood, as such, used with a screen was seldom considered complete without attendant figures of the B.V.M. and St. John.

The custom of reading the gospel from the rood loft has generally fallen into disuse, and it is now perhaps questionable whether it is desirable in these days to design such massive and heavy screens as were called for in the fourteenth and following three centuries. Don't mistake me for a moment. I am the strongest possible advocate for the retention or restoration of the rood screen in some form or another in every church in the land; but as long as the screen is crowned with its proper symbol—as long as the symbolism of the screen is acknowledged—and as long as the precincts of the sanctuary are properly protected from irreverent intrusion, I should be satisfied. But in designing a screen I should never for a moment aim at shutting out from view the altar and its surroundings; and while I have not much sympathy with the all-seeing mania, I should ever aim at not allowing the screen to usurp an undue prominence by obscuring the far more important feature—the altar. A dreary sight indeed it is to go into some of our dear old churches and be called upon to admire a roodless, but otherwise beautiful, screen as an ancient feature, a thing of antiquarian interest; aye, a thing of beauty of design and workmanship, each very well in their way; but when, on turning to the holy table, one sees a table that you would be ashamed to use in your own dining-room, one feels sadly at the admiration bestowed on this detail. The screen expresses the mere admiration of an art curiosity, and not the reverent admiration and pleasure that one should feel that its main object is the beautifying of God's house.

In no country in the world are there more churches with rood screens, or remains of same, than in England, and for beauty of detail and workmanship they are hardly surpassed.

Having now spoken of the general historical and partially symbolic side of my question, I must, for the sake of convenience, divide the practical side into three sections:—1st. Stone Screens. 2nd. Wood Screens. 3rd. Metal Screens.

First, as regards the treatment of stone screens. The principal stone screens remaining in England are of the cathedral type, such as those at Canterbury, York, Westminster, Lincoln, Gloucester, Exeter, Ripon, Norwich, Wells, St. Albans and others. The general features of these are too well known to render it necessary that I should dwell further upon them in detail. I will, therefore, only pick out one or two leading points in treatment and designs.

The general appearance of these screens at present is of course very different from it when they were first erected. In the first place the rood or crucifix with attendant figures have been removed in every case. In the majority of cases the sculptured figures that formerly occupied the many canopied niches have been destroyed or disfigured, and the niches now appear to be unmeaning architectural features. When on a visit to Winchester Cathedral, I was informed by the verger that one of the Deans had allowed the empty niches in the altar screen to be filled with stone urns (an illustration of the screen with these ornaments is given in Mr. Kitchen's most interesting book on the screen). I remarked that I supposed it was

symbolical of a dead religion. The goodly verger turned on his heel and remarked, with evident indignation "I don't know, sir; I don't know."

In many cases the rood has been replaced by a great organ with cases of fine design, but, in my humble opinion, they are and appear entirely out of place.

Of these latter, York Minster stands pre-eminent, and Exeter, Norwich and Manchester are good examples. Of course, organ-builders and even musicians will insist that this is the best place for the organ. Do not be misled; from an ecclesiastical, devotional, and I think artistic point of view, the position is an utterly wrong one.

Choose the west end, transept, or sides, if you like, but do not spoil the general vista of your churches by blocking them up in the centre with an organ. Do not let the organ be the first object to attract attention on entering the church, and usurp a false position of importance. In short, do not convert your churches into sacred music-halls.

I am anxious not to be mistaken. I desire as much as any man that the organ should have the power of speaking to the soul through the beautiful language that only an organ can speak. I desire to see beautifully-designed organ cases, and I cannot too strongly condemn the far too prevalent custom of shutting away an organ in a mere box of a building, and thus destroying the effect of its soul-stirring notes.

No; a right place and space for all things is the motto. Depend upon it, however, more of our churches suffer from being over than under organed.

I feel in sympathy with a wish expressed by Charles I. on entering York Minster, that the organ might be removed so that the east window could be better seen.

Regarding these massive screens, I must confess that when in the nave I have a feeling of being shut out; especially has this struck me at Canterbury, where I think the nave, as at present, seems cold and undevotional in effect.

The beautiful fifteenth-century screen in the transept of the Martyrdom is well worthy of notice. Of the various screens of the kind named, Exeter seems the most satisfactory. Details I will point out presently by the aid of the lantern slide.

There are not a large number of stone screens left in our parochial churches, but of the few I am able to exhibit the photographs this evening I must mention the exceedingly rich example of a fifteenth open stone screen at Totnes, Devon, one of the finest of the kind in England; it is entirely and richly coloured, and the lower panels show the remains of various painted saints. For many years it was spoken of as an oak screen, the deception arising from the fact that a part of the cornice is evidently oak. There are many points in the treatment that are very uncommon, if not unique. The small canopy work is especially worthy of notice.

An interesting example of tomb screen work exists at Paignton, Devon, and other stone screens at Culmstock and Colyton.

A simply thirteenth-century screen in Berkshire, of which I exhibit a drawing, was carefully restored by Mr. Withers some years ago from a small remaining fragment.

An extremely interesting and uncommon example of what I must call, for want of a better term, "constructional screen work" exists at Westwell, in Kent; the treatment is very suggestive. It is in the form of three trefoil headed arches, supported on two slender columns. The church was restored by Mr. Ewan Christian some years ago.

Another noteworthy example is at Stebbing, in Essex, shown on one of the drawings. The flying tracery in centre opening originally carried the ancient rood, but, needless to say, this has been ruthlessly hacked away.

The screen to the lady chapel in Gloucester Cathedral is a fine Perpendicular example of constructional screen work.

In the treatment of these examples we have the germs of splendid opportunities of this kind of screen design. Constructional screens thus designed have the advantage of being permanent, effective and open, whilst still retaining all the symbolism of the screen.

I have attempted this kind of treatment in a somewhat varied form. First, at All Saints, West Dulwich, which is illustrated on the walls with all detail. I have carried my chancel arch to nearly the whole height of the building, i.e. over 60 feet; have filled the upper portion with tracery, supported on two moulded shafts; I tie the whole together with a wrought-iron tie screen, with sliding slots to allow for expansion and contraction, elevating my large cross in the centre compartment. Whether this effect is satisfactory I must leave those to judge who best know the church. I can only say that I shall never regret having tried the experiment, for the first time I believe, on so large a scale.

Should the members of the Association like to visit the church during one of their Saturday outings, I shall be very pleased to show them over, and my friend the vicar, who is present this evening, would, I am sure, be equally pleased to see them.

I have again tried this effect in my design for a church at

Staines for Sir Edward Clarke, which is just going to be carried out. In this the rood is constructed as an actual part of the building.

In the designing of stone screens generally, my advice is don't make them too heavy and massive, don't make them the means of shutting out a good view of the sanctuary. Be careful to have your detail refined without being weak, remembering that the screen is always under close observation. A beautiful lightness and richness can often be imparted by cutting your panel tracery in complete, or nearly complete, relief, and even in very shallow positions, apparent depth can be increased by undercutting at the back of your cusping. As regards colouring, I will speak of that later on under decoration generally.

Wood screen work is, again, a large enough subject to be treated entirely by itself. There are so many exquisite examples throughout the country that it is a difficult matter to select the best.

I have chosen subjects for illustrations from various counties, but I must say principally from my native county Devon.

The screens of Devon and Somerset stand, I think, unsurpassed as regards beauty in the wood-carvers' art, as the Norfolk and Suffolk screens stand unequalled in the richness of their coloured decorations.

From the selection before you I would ask you to particularly notice the following. Harberton, first, for its pure and fine detail; second, the extremely happy way in which the traceried ornament is carried round the columns, giving continuous unity of effect. The screen is brilliant with golden colour, and saints still adorn the lower panels.

Staverton, with its magnificently carved rood loft.

Kenn, with its restored rood crucifix and attendant figures.

Littleham, for the richness of its lower panels.

Plympton St. Maurice, restored by the late Mr. J. D. Sedding.

And last, but not least, the elaborate rood and parclose screens at Dartmouth.

I have to thank Mr. Hems, of Exeter, who has had a great deal to do with the restoration of many screens in Devon and elsewhere, for kindly sending me some samples of old screen carving and photographs of work done, which are here exhibited.

Staverton is amongst the screens which Mr. Hems has lately restored, and I must say that it is simply a beautiful example of modern carved work. Dunster, Somerset, restored by the late Mr. Street (notice especially the treatment of the rood screen). Newark, the loft at Sleaford in Lincolnshire.

Again, the exquisitely-decorated screen at Ranworth, Cawston, and several other screens in Norfolk, are remarkable for the richness of their colouring, as is also the beautiful Suffolk examples of Southwold. Lancaster parish church has some very fine screen and canopy work.

Much beautiful screen work as there is remaining in our parish churches, still vast indeed must have been the destruction of stone, wood, and even metal screens. Who, with any love for our Church or art, has not lamented to see the sad results of work wrought by sacrilegious hands at the time of the Reformation?

That violent commotion which o'erthrew,
In town and city and sequestered glen,
Altar and cross, and church of solemn roof,
And old religious house—pile after pile.

In designing wood screen work be especially careful not to vulgarise or get coarse detail, and never forget material with which you are designing is wood and not stone. The detail of the one will look weak and feeble if applied to stone, and *vice versa*. Stone detail applied to wood generally looks both coarse and vulgar.

Don't think I am simply asserting a truism; it is really a fault that is fallen into far too often, and I have seen several examples where oak pulpits have been actually copied in stone with simply disastrous effect.

I think it questionable whether it is wise to keep on designing screens with heavy rood lofts for our churches. The lofts cannot in most places be used, and to me it seems somewhat purposeless to copy a Mediæval idea simply because it is Mediæval; by all means have rich canopy work and other elaborate treatment which may suggest itself, but I feel that the heavy rood loft with its galleried front, deep-carved cornice and groining under, seems to unnecessarily block up the church. A clergyman once remarked to me that when he entered a church of this kind the heavy rood loft seemed to strike him like a bar. I can quite understand the feeling.

There have been a large number of very beautifully-designed screens in modern times. I illustrate one or two examples, one of a charmingly simple treatment by Messrs. Bodley & Garner, at the Eton Mission Church, Hackney Wick, and another at St. Paul's Church, Morton, Gainsborough, by Messrs. Micklethwaite & Somers Clarke.

The spirit, however, in which the old screens were designed

should enter into our modern work. It is summed up in inscription seen on so many screens.

Let fall down thy *ne* and lift up thy *hart*,
Behold thy Maker on yond cross all to torn;
Remember His woundes that for thee did smart,
Gothyn without syn and of a virgin borne.

The rood-beam treatment does not seem to have been so common in England as elsewhere. There is a beautiful example of loft thrown across from wall to wall, without screen under, at Avesbury, Wiltshire.

Some of the modern rood beams have been well treated, and I think in the design for the new church at Miles Platting, Manchester, by Mr. Leonard Stokes, is very finely treated; as is also that in the new Roman Catholic Church of the Holy Rood, Watford, by Mr. Bentley, whose work is so truly devotional.

There are two sketches of suggestive treatment—first, of St. Stephen's Chapel, Westminster, and the high altar screen at Westminster, by Mr. W. H. Brewer, which are well worthy of careful notice.

Before leaving the subject of wood screens, I must refer to the beautiful example of seventeenth-century screen at St. John the Divine, Leeds—a screen erected about 1642. The whole of this church is full of beautiful woodwork of that period.

East Church, Kent, is a fine example of one of the thirty rood screens of that county.

The church of St. Mary, Woodleigh, Devon, where I found the remains of the old rood in the soffit of the chancel arch, is an interesting example.

Now as regards metal screen work, a subject again teeming with interest and worthy of the closest study, of which here I can only touch the fringe.

Two best Gothic examples are perhaps, first, the screens on the tomb rail at St. George's, Windsor; second, the ironwork of Queen Eleanor's tomb at Westminster; and other numerous examples of grille work. France has many beautiful examples, of which Amiens is an excellent specimen. The grilles at St. Martin's, Brunswick, and Jesuits' Church, Cologne, are but small examples of the quantity of beautiful work to be found in Germany. The finest collection of ironwork for exhibition is, perhaps, that brought together at South Kensington Museum, where one can study the beautiful examples for many hours.

With regard to design I would say, don't try to produce difficult mouldings in metal work. Imitation of wood and stone treatment in metal, as in some iron screens of this century, is utterly wrong. For the ready production and strength good horizontal lines in the upper part lessen the difficulty in making a screen. The insertion of panels in considerable number, which can be perforated or worked to almost any design, gives great firmness to the work, and they are easily fitted.

Nor in any large work is it desirable generally to use more than one metal. Of course, in small work, which can be got at easily, this remark does not apply. Should variety of effect be required, this may best be obtained by gilding, that is, in the case of ironwork.

But brass and ironwork mixed, if not carefully treated often seems to have a patchy effect. Brass when allowed to oxidise for a long time becomes rotten from the zinc used in its manufacture. Brass of the sixteenth and seventeenth centuries stands better than the modern metal, because it was made in a better manner, that is, without so much zinc in it—in fact it was more like bronze. Therefore, if thought advisable to use more than one metal I should advise bronze or copper. Bronze figures can be fairly cheaply introduced with very beautiful effect, and I cannot help thinking that there is a great future for bronze work of this kind, as it is more lasting and often more effective.

There is as good a work in these days turned out from the anvil as in past times. Messrs. Singer, of Frome, are well to the front in this matter, and have turned out some beautiful work, specimens of which I show upon the walls. Among other modern work I must especially name the beautiful screen from Mr. Pearson's design at St. John's, Red Lion Square; St. Michael's, Leeds; grilles at Truro and elsewhere; also the screen at St. Swithin's, Bournemouth, designed by Mr. Norman Shaw.

One of the great faults found in the designing of ironwork seems to be from the general want of knowledge of proportion and sizes of the iron used, and the consequence is that great heaviness and clumsiness is often the result. A good plan is to have a good number of pieces of iron, both square and circular, in your office for reference.

Treat your work simply, without over-ornamentation; always use collars instead of screws, and don't file up your work on completion.

A paper on the treatment of screen work would not be complete without some reference to colour decoration.

1st. As regards stone work, some consider it a sin to use colour for decorated stone work. I am by no means ready to join in this condemnation. Stone screen work can be decorated with equal value as any other material if it is only treated

properly; but it must be treated boldly and without fear. Totnes, as I have before said, is a beautiful example of this kind of work.

The examples that we have of coloured wood work are so numerous that it is unnecessary to dwell upon this subject beyond saying that one should not be afraid of using strong colours, and not falling into the error of depending upon dull æsthetic colours so much in vogue at present. In the dull light of our churches bright colours well harmonised are best.

The decoration of iron work is a somewhat difficult matter; but gilding is, I think, the best treatment. In St. Peter's, Plymouth, I have attained a good effect by first painting the screen in deep dull red, and gilding on the face only, except in the case of the collars or bands, where the gilding was carried round.

Mr. Millard proposed a vote of thanks to Mr. Fellowes Prynne for his paper. This was seconded by Mr. Leonard Stokes, supported by Mr. Warren, Mr. Sidney Vacher, Rev. J. Beeby, the vicar of All Saints, Dulwich, and carried by acclamation.

THE ARCHITECTURE OF BATH.

IN a lecture forming part of a course on "Architecture as the Language of the English People," delivered at Bath by Mr. C. R. Ashbee, he said that the architectural story of England from the close of the Puritan movement into modern commercialism was a step still further down in the ladder of decadence, until they came to what might be called the revival in the middle of the nineteenth century. In this last rung of the ladder they had at the end of the last century a little outburst, a little sort of exotic growth of very beautiful work in the midst of the decay, which was called the Greek Revival, and it was in connection with this transitory and rather hectic phase of English art and architecture that they connected the city of Bath. The close of the eighteenth century left art at its best with the work of Gibbs, the Brothers Adam, Chippendale, Flaxman, Josiah Wedgwood and the English school of painting. All had left their mark in one way or another, and all were more or less inspired by one motive. The principal influence at the close of the century was direct from Greece and marked by the introduction of pure Greek forms. This was best seen in the work of Flaxman, and they saw his influence in a building like the Guildhall, for instance, in the illustrations of Homer. And whenever they saw those delicate forms, such as in the cornice around that room, in that they had the sort of thing that Flaxman delighted in. The architecture of this time, and the architectural planning of a city in the quiet and majestic manner of the Greek Revival, was best illustrated by the city of Bath. He knew no city in England which was so complete in its anyone style of architecture—which was so completely worked out, as it were, in one motive—as the city of Bath. Bath expressed the whole of the eighteenth century, but more especially the latter half. In Bath in the work of Wood and in the planning of the streets, crescents and circuses, the Adam's period was well expressed. There was a largeness and dignity of planning and an extreme refinement of detail. These were the two peculiar characteristics of the architecture of Bath. There were whole streets laid out at a time and planned as one whole—a thing hardly ever done at the present day owing to the impossibility of building through the condition of the land system and system of land tenure at the present day. This made an architectural scheme almost impossible. The peculiar beauty of Bath was the unity of design in it, and it would be the greatest possible misfortune to pull down one of the houses in Pulteney Street, for instance, and rebuild it with red brick. The architectural planning of Bath as a whole, the planning of a street as a whole, and after that the planning of a certain number of buildings in a street as a whole, was a peculiarity of Greek architecture. With it they saw an extreme refinement in detail. He showed them how the room in the Guildhall where the meeting was held was planned on those lines, observing, however, that he was sorry it had been so badly painted. The whole proportions of the room were spoilt by the colour. If that room were treated in one tender colour as a whole they would see at the same moment the large planning of the room and the extreme refinement of detail. Therefore they would see the characteristics which prompted the architects of that time in their work. The tradition of the eighteenth-century art was, however, broken off by the great war, and the industrial and political revolutions in modern England began politically with Waterloo (1815), but artistically they might date it from the beginning of the nineteenth century. The great commercial England was destined to sweep away the last vestige of English architecture, and utterly degrade it altogether. Puritanism had done its worst, but commercialism added another superlative. They might connect with modern England the names of Sir John Soane and the Prince Regent George IV., calling it, so far as the two were concerned, the nadir of English architecture. It was in George's days they

had the last vestige of Protestant architecture at its worst. Between 1800 and 1830 was the worst period in English architecture. A variety of new influences then entered: first, the oriental; second, the romantic; third, revolution ideas; fourth, the religious movement; fifth, the painters. The net result of these five influences was to produce an hitherto ill-digested eclecticism. They would remember that Pulteney Street was not eclectic, and the result was they saw at the present day a great variety of work.

THE PRINCIPLES AND PRACTICE OF VOLUNTARY ARBITRATION.*

IN introducing the subject of voluntary arbitration to the notice of the Society of Architects the author has been prompted to do so through the recent joint action of the Corporation of the City of London and the London Chamber of Commerce in bringing the subject so prominently before the public. A close acquaintance with the leading principles relating to arbitrations is desirable for all business men, and essentially so to an architect, engineer, or surveyor, on account of the many debatable questions which constantly arise in connection with building and other such contracts, and of their peculiar nature.

Disputes arising out of contracts entered into in connection with the construction of buildings necessitate for their proper settlement lengthy inquiries; the taking of complicated accounts, the measurement of works executed and omitted, and the viewing of premises, things which cannot conveniently be done by a judge or jury; and such disputes must of necessity be referred to some person who is able to properly inquire into the matter and ascertain the rights of the respective parties thereto.

Arbitrations are of two kinds—compulsory and by consent; and it is with the latter it is proposed to deal.

To understand the subject it should at the outset be borne in mind that any agreement to settle a prospective dispute without recourse to legal procedure is a contract impeding the administration of the law, and as such repugnant to the common law of the land. Such an agreement was at one time inoperative, as being against public policy, and opposed to a fundamental law of the Constitution that every man shall have the unfettered right to appeal to the properly constituted judges of the country. The Courts have always jealously guarded this right, and it was not until comparatively modern times that laws have been made with a view to assist in the final adjustment of disputes without recourse to litigation.

Since the principle of voluntary arbitration has been legally recognised, the system has grown into one of enormous proportion, culminating in the establishment in the City of London of an elaborate organisation for finally settling disputes of all kinds which arise among business men, without the assistance of a Court of Law.

The idea of voluntarily settling differences without recourse to litigation is not by any means a modern conception. We learn from the researches made into the City records, that as long ago as the fifteenth century aldermen sat as arbitrators to settle disputes to which the Hanseatic merchants who resided in the City were parties. Again, from remote Saxon times existed the Pie-poudre Court, which was held in connection with the Bartholomew fair and other markets, which so-called Court consisted of a tribunal presided over by laymen, who settled disputes which arose between buyers and sellers at the market, in order that they might be finally adjusted on the spot.

The first attempt made by our legislators to place arbitrations upon a satisfactory basis was in the reign of William III. (9 Will. III. c. 15), when an Act was passed for determining differences by arbitration, and was intended to place agreements to submit to arbitration where no action was pending on the same footing as if a cause was pending, and enacted that merchants and others desiring to end any controversy for which there was no remedy but by personal action at law, or suit in equity, might by arbitration agree that their submission of their suit to the award or umpirage of any person or persons should be made a rule of court, and insert such their agreement in their submission. It was also enacted that upon a rule having been made the parties should submit to, and the suit be finally concluded by the award of the arbitrator.

In consequence of the wording of this statute an arbitration held thereunder could until quite recently have been rendered nugatory, even though the submission had actually been made a rule of court if there happened to be no agreement in the submission that it should be made a rule of court (*re Rouse* 6 C.P.D. 612), unless, according to a recent case, a clause that the provisions of the Common Law Procedure Act, 1854, should apply was inserted (*Mitchell v. Governor of Ceylon*, 7 L.N. 265).

* A paper read by Mr. Edgar Farman, solicitor (honorary secretary), at a meeting of the Society of Architects, on February 28, 1893.

Following on in order of date we find the Statutes 3 and 4 Will. IV. c. 37, the Common Law Procedure Act, 1854, and the Judicature Acts, all of which contain provisions applying to the settlement of disputes by arbitration, both compulsory and voluntary.

So far as they apply to arbitrations, all these statutes have now become of historical interest only, as the provisions contained therein affecting the subject have been repealed by the passing of the Arbitration Act, 1889 (52 and 53 Vic. c. 49). This statute not only makes fresh provisions of a most useful and important kind, but also consolidates the law upon the subject. This of itself is a great boon to all concerned in references, and a precedent which might usefully be oftener followed, for the system of producing year after year amending statutes, which partially, but not wholly, repeal former ones, has become little short of a public scandal, making it in many cases almost impossible to ascertain what the law really is. Happily this remark cannot be applied to the subject under our purview to-night, the present law of which we will now consider. In the first place the law, as stated in this paper, applies to England and Wales only, and came into force on January 1, 1890.

The preliminary agreement between the parties to a reference to arbitration is technically known as a submission; and a submission is defined as a written agreement to submit present or future differences to arbitration, whether an arbitrator is named therein or not. The agreement must be in writing, and signed by the parties or their agents and stamped. Whether an agent has power to bind his principal by agreeing to refer a dispute to arbitration depends upon the extent of his authority. An architect would not have such power under an ordinary retainer.

A submission is now irrevocable, except by leave of the Court or a judge, unless a contrary intention is expressed therein. Until the passing of the recent Act a submission has always been liable to be revoked under certain circumstances, and this is one of the mischiefs which the Act is intended to remedy.

It does not appear to be now necessary for a submission to be made a rule of court, as the bare agreement to submit a dispute to arbitration has the same effect in all respects as if it had been made an order of the court.

It is often the practice to insert in submissions the manner in which the arbitration shall be carried out, and the name of the arbitrators selected, and there is still nothing to prevent special arrangements being adopted; but with a view to prevent questions arising from incomplete or badly drawn submissions, and also to bring about uniformity of practice, a very useful schedule has been annexed to the Act which contains a set of rules for the conduct of references, and which by force of the statute apply to all submissions unless a contrary intention is expressed therein. This is an exceedingly useful provision, seeing that the regulations set out will inseparably apply to all submissions unless expressly excluded, either partially or wholly. This was one of the happiest ideas of those responsible for the passing of the measure, and it will certainly be the means of preventing many of the technical objections which it has hitherto been possible for an obstructing party to take.

Let us for a moment consider the present effect of the Act upon a bare submission to arbitrate, or one which does not contain complete provisions as to the conduct of the reference. If no other mode of reference is provided, the reference must be to a single arbitrator. This will, no doubt, meet with the views of many who hold the same opinion as a well-known author upon this subject, who states that nothing in his opinion has tended more to bring discredit upon the resort to arbitration than the practice of having two arbitrators. If a provision has been inserted in the submission that there are to be two arbitrators, in such case the two arbitrators appointed will have the right, at any time before the time within the period during which they have power to make their award, to appoint an umpire. The appointment should be in writing, and signed by both arbitrators, but it does not require a stamp. The time within which the arbitrators must make their award, which must be in writing and stamped, denoting that the *ad valorem* duty has been paid thereon, is within three months after entering on the reference, or after having been called on to act by notice in writing by any party to the submission, or on or before any later day to which the arbitrators by any writing signed by them may from time to time enlarge the time for making the award. Upon this the question may well be asked when does an arbitrator enter upon a reference? In the case of *Baker v. Stevens* (L.R. 22, B. 523), it was held that he only does so when he enters into the matter in dispute with both parties before him, unless he is proceeding *ex parte*, which he can do under certain circumstances. If the arbitrators have allowed the time or extended time to expire without making an award, or have delivered to any party to the submission, or to the umpire, a notice in writing stating that they cannot agree, the umpire may forthwith enter on the reference in lieu of the arbitrators, and in such case the umpire must make his award

within one month after the original or extended time appointed for making the award of the arbitrators has expired, or on or before any later day to which the umpire by any writing signed by him may from time to time enlarge the time for making his award.

Subject to proper legal objections, the parties to a reference must submit to be examined by the arbitrators or umpire, on oath or affirmation, in relation to the matters in dispute, and must produce all documents within their possession or power respectively which may be required or called for, and do all other things which during the proceedings on the reference the arbitrators or umpire may require. Witnesses can be compelled to attend, and must, if the arbitrators or umpire think fit, be examined on oath or affirmation, and the award made by the arbitrators or umpire will be binding on the parties, and on all persons claiming under them, respectively. The award must be properly drawn and be reasonable. An award directing any party to do an impossible act would be bad. Under the provisions of the Stamp Act, an award is liable to *ad valorem* duty. The fact that such a document is not stamped does not render it bad. On the other hand, however, it cannot be acted upon. The arbitrators or umpire have power to direct by whom, and to whom, and in what manner the costs of the reference and award shall be paid, and may tax or settle the amount or any part thereof, and may award costs to be paid as between solicitor and client.

The law which will apply to references in the absence of any express stipulations to the contrary has now been dealt with. The regulations contained in the schedule before referred to are clear, and fall in with what may fairly be assumed is the intention of parties to a submission in the large majority of cases.

To proceed with the subject generally, any person of sound mind and understanding may act as an arbitrator, whether of age or not. There is, therefore, nothing to prevent an infant acting, if the parties desire it. Further than this, it does not appear essential that the selection must be confined to the male sex. There should now be no difficulty in selecting a suitable person as arbitrator in any dispute since the establishment of the London Chamber of Arbitration, which has caused to be compiled and published an approved list of selected gentlemen connected with all the great industries and professions in this country, ready to act when called upon. Has the fact that women are able to act as arbitrators escaped the notice of the City Fathers? There is not a single lady in the list, although disputes are quite conceivable upon which they can form a better judgment than men. It is an amusing spectacle which one sometimes beholds, of a county court judge entering into the mysteries of the fit of a bodice, or other feminine apparel. We nearly had lady county councillors; why not lady arbitrators?

Another source from which capable persons can be drawn is the High Court of Justice, as since the Judicature Act, 1884, the official referees attached thereto have been allowed to act in private references.

There are, of course, many gentlemen outside the Chamber's list, eminent and expensive, and there is nothing to prevent the council of a society such as the Society of Architects acting collectively as arbitrators in a dispute.

Notwithstanding the fact that an agreement has been made to refer a dispute, it often happens that one of the parties repents his act, and upon a dispute arising immediately commences a legal action—which he is clearly entitled to do. This may appear a startling statement after the previous remarks, but it is a fact nevertheless, which forcibly reminds one that, notwithstanding recent legislation, it is still considered undesirable to allow such agreements to oust the Court's jurisdiction. The proper course to be taken in such a case is to enter an appearance to the writ, and before delivering any pleadings to apply to the Court to stay the action, which will be done upon proper evidence being adduced and the Court being satisfied that there is no sufficient reason why the matter in dispute should not be referred. As an instance of a case in which the Court would not restrain legal proceedings, reference may be made to the action of *Wallis v. Hirsch*, where gross fraud was alleged by the plaintiff, and the Court under the circumstances refused to allow the question to be settled by two brokers.

Even if no legal action be taken there are still many ways in which an obstructing party may endeavour to delay the reference and bring it to a deadlock. Let us consider how they may be frustrated. A submission may provide that the reference shall be to a single arbitrator, and all the parties cannot agree who shall act as such; or an appointed arbitrator may refuse to or cannot act under a submission, and it does not appear from its terms that the vacancy shall not be filled up, and the parties fail to agree as to supplying the vacancy; or, again, where the parties or two arbitrators are at liberty to appoint an umpire or third arbitrator and fail to do so; or, lastly, where an appointed umpire or third arbitrator refuses to or cannot act, and the submission does not provide that the

vacancy shall not be filled up, and the parties or arbitrators do not supply the vacancy. In all these cases the proper course to be taken is for any party to serve the other parties, or the arbitrators, as the case may be, with a written notice to appoint an arbitrator, umpire, or third arbitrator. The notice should be clear, and if after service default is made by the parties served in complying therewith within seven clear days after service, application can be made to the Court to appoint a proper person, which under such circumstances will be done.

It often happens that when a submission provides for the appointment of two arbitrators, one to be appointed by each party, one of the arbitrators is unable or refuses to act. In such case the party appointing him may appoint a new arbitrator in his stead, provided there is no provision to the contrary in the submission, and, subject to this, in the event of the party entitled to appoint, purposely or otherwise, failing to do so, either originally or by way of substitution, the other party to the submission may serve a notice upon him to do so, and if he fails for seven clear days to appoint an arbitrator pursuant to the notice, the party serving the notice, and who has appointed his arbitrator, may appoint that arbitrator to act as sole arbitrator, and in such case the sole arbitrator's award will be binding. It may be mentioned that in this case the Court has power to set aside any appointment made in this manner.

In every case, unless the submission provides to the contrary, an arbitrator has now power to administer oaths in a reference. An arbitrator can, if he desires the opinion of the Court, state his award as a whole in the form of a special case, and he can also do so in part upon any question of law.

If an arbitrator has made any clerical mistake, arising from accidental slip or omission, he may now correct it.

Another very useful provision of the new Act is that providing for the compulsory attendance of witnesses. Hitherto it has been necessary to obtain an order of the Court to compel a witness to attend. Now, however, the solicitor for a party requiring the attendance of a witness can obtain a writ of subpoena by the same means as in an action. Witnesses must now attend as long as required; formerly they could not be compelled to attend for more than two consecutive days. If a witness is within the United Kingdom, but outside England or Wales, an application to the Court for an order for his compulsory attendance is still necessary, and if he be in prison a writ of *habeas corpus* must be applied for. A witness can be compelled to produce documents, but need not make any statement in evidence, or produce any papers which would render him liable to criminal prosecution.

If an arbitrator has allowed the time for making his award to expire without doing so, the Court has power to extend it.

Great care should be bestowed upon the wording of the award, and care should be taken not to give an opportunity to a party to get it upset by the High Court. The tossing up of a coin by two arbitrators to settle their differences, or the acceptance of a present, would both be good grounds for setting an award aside.

The Court will not in every case set aside an award, and it has power to remit it back to the arbitrators for rectification or review. If an award is remitted back, the arbitrator must make his fresh award within three calendar months after the order is made, unless otherwise directed in the order. In one case it was decided that the mere fact that an arbitrator has made a mistake in point of law is no ground for setting aside an award, and in another it was decided that an award will not be remitted back upon the ground that the arbitrator has made a mistake in law upon which his award is based unless he admits it. In such a case an arbitrator should at once admit his mistake if he has made one.

The Court has power to remove an arbitrator, before award, for misconduct.

After a reference has been successfully carried out, and everybody is satisfied except the unfortunate party against whom the award goes, the situation may arise of having to enforce it. Before the recent Act, if the submission had been made a rule of court the award could have been enforced by attachment, if not, then the successful party had to bring an action upon the award. At the present time the matter can be carried out more easily and effectively by simply applying to the Court for an order that the award be enforced by the same means as if it were a judgment or order of the Court itself.

Arbitrations should be conducted as far as possible in the same manner as a trial. Too much attention cannot be bestowed upon selecting a suitable place wherein to hold the inquiry—suitable for hearing the parties, their solicitors and witnesses. The author speaks feelingly from personal experience. An arbitrator in his discretion has the power to order all or any witnesses out of the room, but it is not desirable to act thus with the principals to the dispute.

The arbitrator should take notes, and only admit in evidence what would be admitted in a court of law. Time will not permit discussion upon the law of evidence to-night, although it is of the utmost importance to arbitrators. It is quite open

to an arbitrator to postpone or adjourn a reference for any purpose, such as to take a view. Upon the question of inspecting the subject matter in dispute, it may be said that in the case of *Munday v. Black* (9 W.R. 274), being a dispute over work done to a house, it was held that an arbitrator is not bound to take a view.

Such is an outline of the law relating to arbitration, which has been enacted to facilitate the holding of extra judicial inquiries. The proverbial "law's delays" has, it is said, driven a large amount of genuine commercial business away from the Courts of Law, and in view of this allegation special interest attaches to the recent foundation of the London Chamber of Arbitration, and time alone will show whether the Chamber supplies a real or merely a mythical want.

The London Chamber of Arbitration was not founded in a day. In fact, it has taken between ten and eleven years to produce it in its present organised form; and it is the outcome of a motion made by Mr. Henry Clarke, L.C.C., in the Court of Common Council on April 5, 1882. Those responsible for the institution of the Chamber firmly believe in its superiority over legal tribunals, and say that it will save time, money and temper. Whether it will do so is a question of fact to be proved by experience. At present it can only be said that everything has been done calculated to bring about such a much-to-be-desired result. One thing is quite certain, that but for the passing of the recent Act the institution of the Chamber would have been an impossibility. Most men will agree in the assertion that recourse to arbitration will sometimes save time, and those who know anything of the learned registrar of the London Chamber of Arbitration will agree that those who desire rapidity of action will have their wishes fully gratified in that institution. There is no delay allowed in the Chamber. It is often asserted that arbitrations are less expensive than actions at law, and in some instances this may be true, but it may be safely asserted that in many instances it is not. Theoretically, arbitration is a means of settling disputes without the aid of the law or the lawyers, but practically it is not. The cost of carrying out a reference is in all details as great as in an action at law. Solicitors are engaged, witnesses must be paid, and the cost of procedure is just as expensive as if an action were pending instead of a voluntary reference; and, to cap this, a judge has to be provided. In a legal action one can obtain the services of the highest judges in the land for nothing, and if this is not enough, the outlay of twelve shillings will secure the compulsory attendance of twelve good men and true to assist in determining the question in dispute. In an arbitration the serious cost of the arbitrator must be considered, and the high fees paid in many instances are out of all proportion to the work involved, and in many cases increases the cost to a far larger sum than would have been incurred in an action. A correspondent of the *Liverpool Mercury*, where the establishment of a Chamber of Arbitration in Liverpool has been discussed, says that there the past experience of arbitrations has not been altogether favourable, and that certain companies in that city could tell astonishing tales as to the cost of some of their arbitration cases. No charge of exorbitant fees can be brought against the London Chamber of Arbitration. On the contrary they have rather erred in the other direction. The rules of the Chamber are admirably framed, and calculated to insure a speedy settlement of a dispute submitted to its jurisdiction. These rules partially adopt the implied rules which obtain under the Arbitration Act, and in other respects contain special provisions.

In order to insure the success of the Chamber, its rules should be such as will meet the requirements of the commercial community, and thereby create a favourable impression. That the City Corporation and the London Chamber of Commerce are alive to the importance of this fact is evident from the manner in which the rules are framed. There are, however, one or two points to which attention should be drawn, and which deserve consideration.

The three great inducements held out in a publication which may be described as a Corporation blue book, issued in favour of the Chamber, are, that "it will save time, it will save money, and it will save temper;" and as to the last of these qualities no remark is necessary, unless it means that the soothing tone of the amateur judge is more likely to pacify an irate party than that of the real article. If this is the meaning of this part of the text, it is difficult to agree with it. Experience tells the opposite tale, as the beaten party generally bitterly laments in strong language the fact that he did not go to law and obtain what he believes to be his legal rights. The inducement held out, that the adoption of the Chamber will save time, is unquestionably correct, and this fact is eminently calculated to bring grist to the Corporation mill; but in obtaining these much-to-be-desired qualities care must be taken not to run foul of human nature, and wreck the ship at the outset.

Rule 35 of the Chamber provides that the costs of an arbitration shall be in the discretion of the arbitrator, but when one is brought face to face with another rule that only the cost of

attendance at the hearing and witnesses will be allowed, it is at once apparent that each party has practically to bear his own expenses. It has been already stated, and may now be repeated, that theoretically arbitrations are supposed to be carried out without recourse to law and lawyers, but that practically they are not, at least as far as the lawyers are concerned, and this being so it may be unhesitatingly said that the rule in question will be the means of keeping away nearly the whole of the business for which the Chamber is instituted. "Every-man-his-own-lawyer has a fool for his client" is a well-known saying and a true one, and business men know it, and invariably in all disputes consult their solicitor, and further, even if they do venture into the portals of the London Chamber of Arbitration alone, they will speedily retreat with the lengthy and legal looking documents placed before them to sign, to consult their solicitor upon their legal effect. The result of the consultation with a solicitor will at once open a client's eyes to the fact that he will have to pay practically all his own costs, notwithstanding the fact that he may win the case. Now, a client always thinks he has a good case, and burns to make his opponent pay for all the expense and trouble he has been put to, and very naturally does not see the force of having to pay a lot of expenses forced upon him through an opponent disputing his rights. A case in point occurred in the author's own practice only a few weeks ago, when the client ridiculed the suggestion that he should adopt the Chamber for settling his matter, which was a building dispute, when it was pointed out to him that he would have to pay out of his own pocket practically the whole of his own costs.

There is no reason why the recognised rule, which obtains in our Courts and in ordinary arbitrations, that the loser must pay the successful party's costs, should not be adopted in the London Chamber; and, besides, there is another strong reason why it should—the knowledge that reverse in litigation will inevitably involve the unsuccessful party in having to pay the costs incurred, acts as a great check to frivolous and vexatious disputes.

As the rules of the Chamber now stand, it will be quite open for an unscrupulous party to a submission contained in a building or other similar contract, under which many questions can be easily raised, to dispute all along the line with practically pecuniary impunity.

Attention should also be drawn to the fees allowed by the Chamber to arbitrators, which are only payable for the hearing, and amount to two guineas the first hour, and one guinea per hour afterwards. Speaking from an arbitrator's point of view, it appears that these fees are too low.

In very small and simple cases the scale of fees may work as at present, but they certainly are not sufficient in ordinary and larger matters. If the scale allowed were extended to every hour actually expended by the arbitrator upon the reference and the preparation of the award, then the fees would be much nearer the mark. There are many arbitrations the actual hearing of which take only an hour or two, but which necessitate a subsequent lengthy personal investigation apart from the actual hearing, and for which, under the rules, the arbitrator will not be paid at all, neither will he get anything for the preparation of the award, which in many cases is a difficult instrument to draw in legal form, and is prepared by a solicitor. A case can be called to mind of an arbitration over some dilapidations, the hearing of which occupied under two hours, but before the arbitrator could make his award it was necessary for him to inspect and measure up twenty houses, which took him the best part of a week. Under the rules of the Chamber he would apparently get for the work the handsome sum of three guineas.

It is true the arbitrators can make special terms beforehand with the parties, or refuse to act, but from the rules and the way in which the scheme is put forward disputants will no doubt submit to the Chamber, under the impression that the cost of an official arbitrator will be in accordance with the scale of fees prescribed in the schedule, only to find out subsequently that one cannot be provided except at as high a figure as if the Chamber had not been adopted, with the result that the cost of the arbitration will actually be much more expensive to the successful party than if it had taken place in the ordinary manner, because by the rules of the Chamber he will have to bear practically the whole of his own expenses, which he would not have to do in an ordinary arbitration. It would be much better for a fixed reasonable sliding scale to be adopted for the arbitrators' fees, regulated according to the time expended, and an additional fee allowed for the preparation of the award, and no arbitrators nominated except those willing to act under the rules and according to the official scale.

Another matter which may be mentioned is the at present compulsory rule that the parties to a dispute must sign the submission framed by the Chamber. This may work all right where no previous agreement to refer has been entered into, but in the majority of cases submissions are entered into long before any dispute arises, as in a building contract. The Chamber should adopt and publish a short agreement to be

inserted in contracts, and certainly adopt any submission framed with a view to the hearing of the matter by the Chamber, whatever may be its form. The Chamber appears to be of this opinion, as the matter has recently been discussed, and the author has been favoured with an advance copy of an agreement for insertion in contracts, but it is too long; what is wanted is something very short.

ARCHITECTS' FEES.

THE action brought by Mr. Wilson, a Bideford architect, to recover 152*l.* 15*s.* for work done by him for Mr. G. Taylor, has been heard at the Devon Assizes. Counsel for plaintiff said the defendant resided for some time at Westward Ho! at which place he had considerable interest in property, and was at present residing at Abbotsham Court. In October 1891 the defendant communicated with the plaintiff, expressing a wish to see him. They met soon afterwards, and plaintiff accompanied the defendant to Westward Ho! the latter desiring to convert the Ladies' Baths at Westward Ho! into a boarding-house. He requested the plaintiff to proceed with the preparation of the necessary plans and specifications. Plaintiff acted upon these instructions, and prepared rough plans, which defendant approved. Afterwards more elaborate plans were prepared. Mr. Wilson was asked to get on as quickly as possible with the work. The plans were got out and tenders issued for the work, the defendant informing the plaintiff that he had his wishes pretty well expressed on the plans. Some correspondence then occurred, and it terminated in defendant refusing to have the work done. All the work was completed which an architect could carry out beyond the supervision of the actual building. Defendant had offered 35*l.* for the plaintiff's services rendered, but this was refused, Mr. Wilson contending that he was entitled to the amount claimed.

The plaintiff gave evidence corresponding with the statement of counsel. In cross-examination, he said he was occupied on the work for ninety days, but not the whole of that time. His brother also assisted him. He denied going through the form of getting out bills of quantities in order to be able to charge for the work. He did not know that Mr. Hookway was employed by the three persons who tendered to prepare the bills of quantities for them. He knew that Mr. Hookway was employed by Mr. Glover.

Mr. F. W. Wilson, who assisted to prepare the plans and specifications, said he accompanied his brother to Westward Ho! and heard the defendant give his instructions. He also heard Mr. Taylor ask his brother at the office at Bideford to prepare the bill of quantities.

Mr. Jas. Jerman, architect, said he had examined the plans and specifications made by the plaintiff, and he thought his charge was a fair one. He charged according to the local rates, which would have been about 7*l.* less than plaintiff's amount.

Mr. Charles E. Ware, architect, said the plaintiff's charges were fair and reasonable, and were those recognised by the schedule of the Royal Institute of British Architects.

Counsel said he had other well-known architects of the county ready to give evidence as to the correctness of the amount charged, but he would not call them, as they would simply corroborate Mr. Jerman and Mr. Ware.

Counsel for defendant said there were only two questions for the jury to decide. Mr. Taylor would state that he always informed the plaintiff that he was only to prepare plans not to exceed 800*l.* or 900*l.*, and having known the defendant's wishes thoroughly the plans should not have been prepared for a larger amount. The plaintiff, however, on the other hand, said that was never mentioned until after the tenders came in. The second point for them to decide was whether the defendant ever instructed the plaintiff to prepare a bill of quantities. He asked whether it was not dangerous to allow any profession to charge their own commission.

His Lordship: That comes very near home.

Mr. George L. Taylor, the defendant, stated that he told the plaintiff he wanted to spend 800*l.* or 900*l.*, but if plaintiff's estimate exceeded the sum, witness had another scheme to lower the bath and let the sea run in, thus saving the cost of pumping. He also further stated that he had another scheme to spend the money on a villa. When plaintiff brought the plans to Tanton's Hotel, Westward Ho! defendant asked him what the price would be, and he said between 2,000*l.* and 3,000*l.* Witness asked him what he meant, and knocked the plans off the table, saying he told him he would not spend more than a third of the money.

The Judge: What did the plaintiff say?

The Defendant: He didn't say anything.

The Judge: Did he pick up the plans?

The Defendant: Yes; he picked them up and went away.

The Judge: Then he didn't say anything, but picked up the plans?

Defendant further said he gave an instruction for quantities,

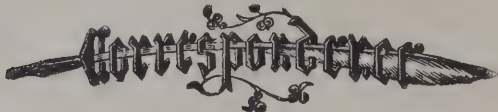
to be got out by Mr. Wilson. It was the custom for the builders to get them out themselves. In cross-examination Mr. Taylor admitted that the plans were submitted to him, and that he did nothing to prevent tenders being obtained. He did not think there was any letter in existence in which he mentioned that he did not wish to go beyond 800*l.* or 900*l.* He denied giving any direct order for the quantities.

Mr. Murray, jobmaster, of Westward Ho! said he accompanied the plaintiff and defendant over the baths. He heard the latter tell Mr. Wilson that he required rough plans for the conversion of the baths into a boarding-house, but that he did not want to pay more than 800*l.* or 900*l.*

Counsel for defendant said the case was pre-eminently for the jury to decide as men having knowledge of business matters. It was admitted that if there was an understanding or an agreement, plans should be got out, and they should not exceed in the cost of building and alteration more than 900*l.* The truth was that plaintiff had made an unfortunate mistake in the preparation of his plans.

His Lordship said it seemed to him that a great deal of time and care had been expended upon the preparation of the plans, and plaintiff should be paid for the work undertaken. The whole dispute between the parties was as to the amount of the tender, and the jury were to decide which of the two men they could best rely upon as to what really took place.

The jury, after twenty minutes' deliberation, gave a verdict for the plaintiff for 96*l.* 10*s.*, including the 35*l.* paid into Court.



The Future of Architecture.

SIR,—An eloquent writer in this month's *Nineteenth Century* review has some remarks on the above subject, which you had allowed me to discuss in your issue of February 17, and as he is rather more hopeful of the future than I can persuade myself to be, and as I think he is a little at fault in his history and his logic, I should like to recur briefly to the matter.

He says, "And so history tells us it must be. The dead Gothic will never live again any more than the dead Classic, but from its ruins ought to arise, and will arise, if we work honestly and rationally and not like mere antiquaries and copyists, something new, something that lives, a modern art which will be to us what bygone styles were to those who speak to us through them. Signs are not wanting, especially in England, that this new growth has begun; let it be ours to secure its freedom for development." I for one will pray devoutly that this be true, but a few isolated examples of excellent work are insufficient proof, nor does my own reading of history permit me to lay the flattering unction to my soul. If the improvement is to come within reasonable time, something more powerful and active than development is necessary. What has modern architecture during the last fifty years to show of the power of development?

On the other hand, one of the greatest, noblest and most useful and beautiful of the styles—most useful because fairly in harmony with modern wants—was not the work of development, but largely of adoption or eclecticism in a sudden national crisis. The Romans before the sixth century were, as regards their architecture, pretty much in the same position as we are ourselves at the present day. They had no national style of their own, but busied themselves with copying Etruscan and Greek examples of the art, and under Constantine and Honorius its character had fallen to zero. For its resuscitation some new and all-powerful stimulus was indispensable. It speedily came. A new life and new artistic wants were created by the accidental meeting of Western with Eastern artists. The West had been at war with the East. Justinian and his soldiers had seen the vast arches, lofty domes and rich internal decorations of the Sassanian palace at Ctesiphon. The Emperor had concluded a treaty of peace with Anushirwan of Persia, the king of kings, and in the intercourse which followed many skilful designers came from the East and supplied him with much of that artistic element by means of which he made his buildings monuments of beauty such as have never been surpassed. The great church of Santa Sophia, which he built at Constantinople, differed from all previous structures in its magnificently vaulted areas, decorated with gold ground mosaics, by means of which the Christian Emperor recorded the tenets of his faith. In all subsequent buildings on the soil of Italy this style continued to exercise an important influence almost down to the present day.

Now, though we Englishmen are like the Romans I have been referring to, having no living national style of architecture, nor a wealthy and despotic prince like Justinian, able and willing to engage in grand and noble architectural projects, even if the result should promise to be as striking as that I

have referred to, yet perhaps we may be on the way to it, that is, to putting life into our architecture, for, as I said before, there is none in it at present.

Our era is a very wonderful one, and, happily, the net political result of the last half-century is such as to satisfy the most ardent reformer. On all hands progress is conspicuous, and if the "mother of all the arts" seems to be asleep just now, it is impossible to glance at the present general state of the arts and of industry and not have hope in the future; indeed, for him who can even remember 1851, with its international exhibition and "Chamber of Horrors," a perfectly satisfactory future in every branch of art and science must seem assured.

What, then, is the ground for hope and confidence in the future of our own particular art? For my own part I am inclined to rely upon the democratic spirit of the age, without which the past progress could not have been realised. With Board schools, in which the young are taught how to draw, with schools of art, museums and picture-galleries in almost every parish, and many other popular institutions, an educated democracy must be rising up that will have not only the power, but the will, that the requisite encouragement and expenditure shall be given to the establishment of a national style of architecture, with edifices characterised by excellence of construction and materials, beauty of design and details, and differing from any national building that has been done before in this metropolis, inasmuch as it will be impossible they will fall to pieces in the lifetime of the designer.

Thus, sir, if I am not mistaken, we shall see one of the noblest illustrations of the liberal spirit of the age, enlightened democracy taking the place of crushing despotism in the patronage of the arts, and, with it all, good wages and moderate hours of labour, so that the workman will have time to think not only of his body, but of his mind and his soul.

HERMES.

Coventry Baths.

SIR,—In your issue of 10th inst., two lists of tenders for heating apparatus are given, from which it appears that the Rainbow Engineering Company's tender was accepted in October last, after which other tenders were obtained, and that of the Coventry Gas Fittings Company, Limited, was accepted by the City Council on the recommendation of the Baths Committee (vide *Architect*, March 3, p. 16).

The procedure of the Coventry Council seems, as you call it, unintelligible, and you suggest that an explanation would be of interest.

Although it may not be a full explanation, the strange course taken by the Council is rendered very much more intelligible by a comparison of a list of Coventry Councillors with a list of shareholders in the Coventry Gas Fittings Company, Limited which shows that the interests of the shareholder have been well cared for by the Councillor.

Some further explanation would be very welcome to, yours obediently,

TRUTH.

March 16, 1893.

GENERAL.

The *Meissonier Exhibition* produced on the first day no less than 16,000 francs.

Mr. *Herkomer, R.A.*, has been elected President of the Birmingham Society of Artists, in succession to Mr. Orchardson, R.A.

The *Exhibition* of the Royal Society of British Artists will open on Monday next.

A Paper on "The Manufacture of Non-poisonous White Lead" will be read by Mr. Perry F. Nursey, C.E., at the meeting of the Society of Arts on Wednesday.

The *Committee* elected for the Glasgow Architectural Association are as follows:—Hon. president, Mr. Campbell Douglas; president, Mr. Alexander M'Gibbon; vice-president, Mr. Alex. N. Paterson; hon. secretaries, Mr. John White and Mr. Walter Watson; hon. treasurer, Mr. Hugh Dale; hon. librarian, Mr. W. Tait Connor; general committee, Mr. Robert J. Gildard, Mr. Andrew Robertson, Mr. John Arthur, Mr. Wm. Fraser.

The *Government of Bengal* have sanctioned an estimate of 1,49,884 rs. for the construction of a new building for the local School of Art.

Mr. *Henry Morris*, who served his apprenticeship with Messrs. Ross & Macbeth, architects, has been presented with a purse of sovereigns and a handsomely-fitted travelling-bag on the occasion of his leaving Inverness.

Mr. *T. Mellard Reade* has been appointed architect for the Board school which is to be erected in Kensington Fields, Liverpool.

A Paper, entitled "A few Notes on Hot-water Supply," will be read by Mr. R. J. Angel at the meeting of the Liverpool Architectural Society on Monday next.

The Architect.

THE WEEK.

Two of the foremost of the jurors in the section of painting of the forthcoming Salon have resigned their office. M. BOUGUEREAU says he does not approve of the regulation by which the number of works exhibited is limited to 1,800, and he therefore feels it would not be right to accept functions and assume responsibility for carrying out the proposal. M. BENJAMIN CONSTANT states that he will shortly be on his way to Chicago, and therefore cannot serve as a jurymen. It is not unlikely that some other jurymen will follow their example. Both artists were members of the First Group, with MM. MAIGNAN, CORMON and HENNER.

A PAPER was read by Dr. PHENÉ, architect, on "Golden Apples," at the last meeting of the British Archæological Association. Nearly twenty years ago Dr. PHENÉ visited various localities in which legends of a python were associated with golden apples, to elucidate, if possible, these myths. He succeeded in finding curious varieties of original forms of pomaceous fruits, not indigenous to the localities, but of Oriental origin. These he made known, and as the botanical evidence pointed to Persia and the traditions to India, he determined to prosecute his inquiries in the East. As result he obtained information in which the pear-shaped fruit of Rama was found to be the same in form and indentation with the objects held by the priests of Asshur, and on the apple-like espalier formed trees of Nineveh. He produced examples by photographs of this shaped fruit being offered to the Hindu deities, of their eating it, of its form on the thyrsus, on altars at Pompeii, &c. The tree was also traced, through geological and historical writers, to western Europe and into the districts of the well-known classical myths. These myths, legends and apples in every case led into the orchard and cider districts of Gaul and Britain, and there were found with them in the West the names of places and peoples identical with those named by HERODOTUS and others as the possessors of trees in Thrace and India. A direct line of route bearing the same names in considerable number was shown from India to Britain of several different tribes or peoples, who in almost every case were found to be located side by side with each other and to have the same customs, worship and habits. Many points indicated their association with dolmens, and it was pointed out that the dolmen districts in particular abounded with these traditions, and were almost always in apple and cider localities. Hence it was inferred that these immigrants were the builders of the dolmens and the introducers of the apple and pythonic traditions in Western Europe.

In last November the Works Committee of the London School Board asked for sanction of a further expenditure, not to exceed 3,000*l.*, for the provision of a tower (containing five additional rooms) in connection with the enlargement of the head offices of the Board now in course of erection, this amount being inclusive of the cost of providing a striking clock. The proposal was sent back for further consideration. The Works Committee now say they have since considered this matter more carefully and have obtained further information from Mr. EDIS, the architect for the enlargement, who states that he roughly estimates the additional cost of making the proposed addition to the centre of the building as enlarged (which will contain four additional rooms), together with a clock, at 1,500*l.*, and that the outside limit of the cost would be 2,000*l.* The additional accommodation which would thus be provided could only be obtained, if hired, at a rental of about 90*l.* per annum, and the committee are strongly of opinion that it would be desirable to make this provision while the other contemplated alterations to the offices are being mistaken. As it will be necessary to take immediate action if the proposed alterations are to be carried out they ask that the alterations to the offices of the Board, in accordance with the plans submitted, including the proposed central feature of the tower, be

carried out by Messrs. HIGGS & HILL, the contractors, for the enlargement of the offices, the work to be measured up on completion, and the cost calculated on their contract schedule of prices.

A MEETING of the Birmingham Association was held on Tuesday last, when a report was presented by the Council on the building by-laws of the city and their administration. The secretary was instructed to communicate with the public works committee, with a view to obtaining some modifications therein, and in the methods of administering them, which, it is thought, would lead to much improvement in working. Mr. HERBERT R. LLOYD brought under the notice of the meeting the clause in the conditions of competition issued by the committee of the new Municipal Technical School, referring to the award of premiums, and reserving to the committee the right to employ an architect other than one of the competitors to carry out the works, and the secretary was instructed to communicate with the committee, pointing out that the clause is derogatory to the profession, and likely to prevent some of the invited architects from competing.

It will be an advantage for many architects, builders and contractors to know that DORMAN, LONG & Co., Limited, of Middlesbrough and Westminster, have opened a yard at Nine Elms Lane, Vauxhall, where a large stock of all the girders rolled by the company and several other sections of steel will be kept, to supply orders without delay. Machinery has been also laid down capable of dealing with the manufacture of compound girders, the cutting, fitting and drilling of holes in joists, &c., and by its aid DORMAN, LONG & Co. are prepared to guarantee delivery of orders at a few hours' notice. All their girders are made at their own works from "Siemens-Martin" steel, having a tensile strain of from 28 to 32 tons per square inch, with an elongation of 20 per cent. in 8 inches, and are made to pass the tests specified by the leading engineers and architects. The sections of rolled steel joists kept in stock range from 3 inches by 1½ inches, weighing 4 lbs. per foot, to 18 inches by 7 inches, weighing 75 lbs. per foot. The latter can be obtained up to 45 feet in length, and lengths of 16-inch girders up to 50 feet are kept in stock. Delays in the supply of joists often cause much inconvenience to architects and builders, and they will be able to appreciate the enterprise by which all the sections and lengths that are required in the majority of cases are placed at their disposal in London.

FROM Latin grammars and other school books the notion is derived at an early age that the ancient Romans were a sort of people who, like soldiers in general, treated most things as if they were part of drill, and therefore mechanically. Their roads are supposed to have been as much alike in character as if they had been constructed according to one specification. There is, however, a difference between the Roman roads in England and in Scotland. Some sections of a road near Moffat, in Upper Annandale, have been lately closely examined by Mr. J. T. JOHNSTONE. The road was found to be 21 feet wide, with a whinstone kerb along each side. From foundation to crown it was 23 inches, exclusive of the turf covering it. As a foundation there was a layer of clay, with stones bedded on its surface, 6 inches deep in the centre, and tapering to each side, the stones being undressed and pressed from an inch to an inch and a half into the clay. Then came a layer of stones, 11 inches deep, with vacancies filled up with "till," the stones being on the average the size of a boy's head. On the top was a layer of smaller stones some 4 inches deep, forming the surface of the roadway. A mile further south the depth was about the same, but there were only two layers of stones, with evidently about an inch of peat moss on the bottom. At a spot three miles north the bottom layer was 11 inches deep, the clay and the stones had the appearance of having been mixed together and laid in like concrete, and the stones were small and similar to those first described; while the next and surface layer was 6 inches thick, formed of stones, with the vacancies filled up with "till."

THE SPITZER COLLECTION.

DURING the two months between April 17 and June 17 of the present year, collectors, amateurs and dealers from many parts of the world are likely to visit Paris, attracted by the dispersion of the renowned Spitzer Collection. Some of them will no doubt become purchasers at the auction, but the majority of the visitors may only be desirous to behold the collection, or part of it, *in situ*, adorning the rooms of the house in the Rue de Villejuste, which was planned and erected by SPITZER in order that his treasures might be most advantageously seen. In him the qualities of the dealer and the enthusiastic amateur were combined in the strangest way, and many people who were acquainted with him believe that the collection which is about to be sold was accumulated for his own delight. It was his practice to spend all his available time in the rooms, and who knows how often, like MAZARIN among the pictures he had acquired, SPITZER was troubled with the thought that one day he was destined to part from objects that to him at least were not inanimate?

As one of the keenest dealers of his time, SPITZER must have felt that it would be impossible to convince the world of the existence of any other motive in his breast except buying in the cheapest and selling in the dearest market. But the collection in his house is unlike anything to be found in the largest warehouses of "curios" and "antiques." In the first place, it mainly represents two periods—Gothic and Renaissance. Classic art is only scantily represented, and probably was allowed admission in the house because it was supposed to have a relation to Renaissance work. Byzantine art was also a necessity, for without examples the section devoted to ivories would not be so fully appreciated. But the variety of Renaissance objects is so marked we might suppose that SPITZER contemplated the exemplification of some comprehensive book upon those periods. Let anyone compare the descriptive catalogue and photographs with DE LABORDE'S "Glossaire et Répertoire," or any other standard treatise, and it will be found that the collection goes a long way towards the illustration of the terms. But SPITZER would not be satisfied with securing every object which was described in an archæological dictionary relating to his period. With him it was not enough for an object to be produced in the thirteenth century or the sixteenth century. No doubt he was ready to satisfy his clients, but when catering for himself beauty of form was of more importance than age. Judging from the character of his collection, SPITZER was entitled to be considered as possessing the most refined taste. There is hardly one of the pieces in his house that does not deserve to be taken as an example of artistic power. We may, or may not, approve of the principles that were adopted in their production, but we are forced to acknowledge that we have before us works which will bear comparison with any of the most prized efforts of contemporary artists. On that account GAMBETTA was giving prudent advice when he recommended that the Spitzer Collection should be acquired by the city of Paris, or the French Government, and preserved as it was left by the owner. It is not only valuable for containing many rarities among the three and four thousand choice examples, and for being so strictly preserved from everything that would not gain the admiration of experts. It has, moreover, the unity which is secured when artists observe rational rules of decoration. Your connoisseur might not be satisfied with the collection, because SPITZER was indifferent to the personal associations which are believed to impart interest to the meanest things. If the workmanship of a cup was beautiful he was willing to pay a large price for it, although it might not have belonged to a king's mistress nor was used to poison a rival. He proudly left his purchases to speak for themselves. They might not be successful in appealing to the fribbles who are bringing archæology into contempt, but among the most vigorous class of designers and workmen in Birmingham, Manchester, Sheffield, Glasgow, Belfast, or in one of the American cities (for we need not count France and Germany) they would be eloquent and inspire emulation. If the money that is expended every year in England on useless pictures or books which nobody will be allowed to read (like those lately presented to Manchester) could be

devoted to the purchase of the Spitzer Collection, an act would be accomplished which hereafter must be still more appreciated than in our time. For long years will elapse before there are chances presented for securing such a variety of treasures, and in the next place it is improbable that a man like SPITZER will be found who will set his heart on securing and preserving unbroken a multitude of objects in spite of continual efforts by his millionaire clients. At present there is no sign of preserving the collection. It is not easy to discover a philanthropist who is willing to expend half a million sterling in order to encourage industrial art: more *éclat* is to be gained by donations on behalf of fine art, that is to say, on paintings. The utmost that may be expected is that some of the European Governments will endeavour to fill up gaps in museums out of the hoard. The French Government have already agreed to an expenditure of 20,000*l.* with that intention. The precious series representative of sculpture in boxwood will no doubt be secured for Berlin, and will hardly go unattended by other work. But the greater part of the *chefs d'œuvre* of the Mediæval and Renaissance craftsmen are sure to find their way to the cabinets of the treasure seekers who have so long coveted them; although, with all their gold, they could not tempt SPITZER to disturb the completeness of his collection by sacrificing the smallest of the jewels, ivories, medals or embroideries. SHYLOCK declared he would not part with the turquoise that LEAH gave him, when he was a bachelor, for a wilderness of monkeys, and who can tell how many mysterious associations bound the Wandering Jew of the bric-à-brac world to the beautiful things for which princes became suitors? He could feel the satisfaction of being able to resist all that wealth, diplomacy, enthusiasm and power were able to do in trying to prevail with him, and as he wandered from room to room would enjoy the luxury of security, thankful that his race was no longer compelled to yield to brute force, to cower before rank and to submit to spoliation. HEINE knew Paris as well as SPITZER, and was a better judge of the influence of modern ideas, yet it was surely an apprehension of the probability of a return of the old animosities which made the poet write the warning epigraph to his Hebrew Melodies, in which he counselled his brethren to prefer the safety which comes from obscurity:—

Fliegt dir das Glück vorbei einmal,
So fass' es am Zipfel.
Auch rath' ich dir, baue dein Hüttchen im Thal
Und nicht auf dem Gipfel.

SPITZER did not act on that advice, for he not only set up his house in a prominent quarter of Paris, but he allowed all the world to come and see the treasures he had been garnering during many years and from many lands—treasures which were enough to make a capuchin become covetous.

He was too skilful a trader to forget in his own house the advantages of arrangements for enhancing the appearance of *bibelots*. The tapestry that lines the staircase walls and the sculptured figures that seem to be guides raise the expectation of the visitor. The first room entered is SPITZER'S own, which appears to be a sanctum for some luxurious amateur rather than a place for business. Paris is no longer around. The light enters through stained-glass windows. The eye at once rests on the great chimney-piece, which came from Arnay-le-Duc. Wherever the visitor looks he sees many things to attract his notice; and, as it were, the contents of the remaining rooms are suggested to him by the examples of statuettes, faïence, metal-work, &c. In one place is a famous "dressoir" from Annecy; in another the cabinet of gilt leather which was made for PHILIP III.; old "armoires" from Lyons are contrasted with others of Burgundian types. The panels of the door are filled with Spanish grotesques, and on one is inscribed a sentence that might with advantage be written over the doors of all museums and galleries of art, "*carpere facilius est quam imitari*"—"It is easier to criticise than to imitate."

The adjoining room is lighted from above, and in it French Renaissance is paramount. There are many examples of sculpture, seventy-five pieces by PALISSY, embroideries from Tours, aiguères or water-flasks and drinking-cups from Dinant (then a French town), illuminated manuscripts,

leather-work, coffers, pottery, &c. Of French enamels there are seventy examples, coming from various schools. Then come the ivories, ranging from the severe Byzantine productions to late Renaissance figures, which suggest that some sculptors preferred the material to marble or bronze. Rivaling them in delicacy are the boxwood carvings which were produced in Germany, and were not without influence on the sculpture in stone and bronze.

The collection of Mediæval goldsmiths' work is a testimony to the fascination which the Church exercised over artists. It is no wonder that so many examples, not only in the Spitzer, but in all large collections, are supposed to be the work of monks. Laymen who were subjected to the rigorous laws of trade are considered to have been incapable to spend the time that was necessary in elaborating designs and models and in giving the utmost perfection to all the details of so many remarkable pieces. They are as much opposed to principles of political economy as the interlaced ornament of Celtic manuscripts. There is another difficulty, which also supports the theory of the prevalence of monastic goldsmiths. This is the absence in numerous cases of peculiarities by which the pieces can be identified as produced in particular cities or districts. If such exquisite chalices, ciboriums, reliquaries, shrines, crosses, thuribles, figures, &c., were obtainable in many places, why is it that we have not examples of secular work displaying similar skill?

The Spitzer Collection affords additional evidence of the all-but inexhaustible wealth of Italy in works of art. On one of the reliefs which came from Sassuolo the Duke ALPHONSE D'ESTE had inscribed "Hic nunquam minus solus quam cum solus," "Never am I less solitary than when I am here alone," or, as PROSPERO expressed it, "My library was dukedom large enough." The words reveal to us one of the causes for which art was promoted in Italy. Pictures and sculpture were not employed merely for ostentation, or as means to impress visitors; they afforded so much genuine delight to the owners that they became a necessity. It was the same with the minor arts. If elsewhere in SPITZER'S house we have survivals of a devotion to art, the Italian room, with its sculpture, goldsmiths' work, enamels, glass-paintings, coffers, jewellery, tapestry, furniture, faience, &c., in which not merely form but colour is expressed, seems to recall a time when admiration became idolatry, and a land where "art and miracle drew equal breath." The few examples of Greek and Greco-Roman art which SPITZER introduced are not over-severe, and not without relationship to Italian work.

One important class of Italian art which some critics believe to be the most interesting among all SPITZER'S gatherings will not be sold at the auction which begins next month. We refer to the collection of arms, and in which about six hundred weapons and pieces of armour are to be seen. They show that men in steel were not repulsive, and if the old Italians used ironclad ships they would impart some beauty to them.

Ordinary people must be content without any sample out of SPITZER'S cases. Fortunately they need not be without a record that will afford some compensation. On account of the extraordinary character of the sale—for it will require about forty days to dispose of the three thousand and sixty-nine "lots"—a catalogue of commensurate importance has been issued. It consists of two large volumes of letterpress and a portfolio of seventy folio plates filled with photographic reproductions of the most interesting objects. There are some men who can find attractiveness in any sort of auctioneer's catalogue, but in this case it is no exaggeration to say that for artists, amateurs, students of art, craftsmen and manufacturers the catalogue of the Spitzer sale will become a substitute for a museum of Renaissance and Mediæval art. It is to be obtained from Mr. CHARLES DAVIS, of New Bond Street, the London agent. If it is remembered that the retrospective exhibitions of Paris in 1878 and 1889 owed much of their interest to the contributions from the late M. SPITZER, the value of a record of the collection will be evident. Every school of art in the country should possess a copy of the catalogue, which will be found to be an invaluable supplement to all treatises on the work of the periods to which it relates.

THE RELATION BETWEEN THE ENGINEER AND THE ARCHITECT IN AMERICA.*

IN a proper sense the term "architect" should designate a man of certain attainments, but in deference to a popular prejudice it is applied in the following to an artist who designs and superintends the erection of buildings, although it will be admitted after due consideration that our best architects are quite often as good engineers as they are artists, and that sometimes they are pre-eminently good business men.

The first and most evident of their relations is the jealousy between them which should not exist, considering how intimately the work of the two professions is interwoven. Yet we find, on the one hand, an engineer of considerable experience complaining of the architect's treatment of "the man who does the practical work," while, on the other hand, a great many architects do not employ a man of proper training and experience to do their engineering work, claiming that there is not enough of such work to require it, or else that they find the engineer impracticable or intractable.

There is no doubt that if the engineers were perfect, they could find fault with good grace with the artistic architect for the impracticable way in which he sometimes plays with the interests of his clients, promising drawings and results for dates weeks in advance of what is possible, and the architect could with as much reason criticise the way in which the engineer serenely erects the most hideous structures, simply because he fancies that he can in this way save to the owner a few pounds of metal or a few dollars of cost. These are extreme cases, and they are each day becoming rarer, but they serve to explain why the feeling of jealousy exists, since each feels that the other is guilty of a sin that is unpardonable, while his own is not so very bad, all things considered.

The ideal requirement is that all of the various qualities of good artist, good engineer and good business man should be combined in one man, who would be qualified to give each branch its proper weight in the solution of any problem. In practice this is generally impossible of attainment because of the widely-varying temperament and training needed for the best results, and we must therefore look to a combination of these three elements in at least two individuals, working together in each architectural combination that is to meet the implied obligation assumed by every professional man when he solicits the patronage of his fellows, to render a service at least as good as the average, and, in some particular, better. We should then have the various problems that each commission contains carefully studied by specialists, and the final result would represent that happy mean that is the best for the case.

The writer has had considerable experience in this line, and feels that the cause of much of the friction is due to the lack of proper training of the engineers for this particular work, due largely to the newness of the demand.

Instead of the feeling that once existed that the architect should know at least all that the "Encyclopædia Britannica" contained, people nowadays are differentiating and do not expect so much of practical things from the artist, but in many cases transfer to the business or practical man a part of this requirement of mechanical or engineering knowledge, and welcome the services of the expert whenever they are rightly needed.

The requirements of the "domestic" or architect's engineer are certainly great, since he must have on tap at all times information of the best usual practice in regard to character and resistance of materials, including earths, stones, bricks, clays, woods, metals, cements, plasters, glass, paints, papers, wools and other textile fabrics, and methods of manufacturing and working these materials; heating by hot air, hot water or steam; ventilation, steam cooking, gas and electric power and lighting, steam-power plants, plumbing, water-supply and sewage disposal and the laws relating to contracts. He must also be sufficiently trained in mechanical engineering to be able to appreciate the requirements of almost any manufacture or business, so as to be able to make plans for the case in question at least as good as the average or a little better. His experience in these branches must be such that, while the first studies are being made, he can formulate the requirements in such a way as to determine the approximate limits of the space required for each of the mechanical features, so that space can be allowed for them at the beginning which will be sufficient for his needs when the time comes to take them up, perhaps months after the plans are drawn and the work begun. He must know enough of art to appreciate its limitations, so that his suggestions of what must be done to accomplish economical buildable results may be permissible from the artistic point of view. He must also know that a given lay-out of the framing will be within a small percentage of the most economical that can be made for the given case, so that his assistants can be kept at work on the detailed computations, thus keeping pace with the balance of the work. In the actual execution of work he should be able to do anything that is needed on a building,

* A paper by Mr. George Hill in the *Engineering Magazine*.

although perhaps not in the expeditious way that can be gained only by long practice. Finally, he should know that in each of these varied branches his knowledge must be in a measure superficial, and that there are men in each branch who know more than himself, who should be called to his aid when the interests of his client demand expert advice.

To obtain such knowledge as is here outlined it is necessary that a man be thoroughly trained in some good technical school, preferably mechanical, and that his mathematical training be of the most thorough kind—not that he will ever need anything higher than trigonometry, but that the analytical habit that comes from a thorough mathematical training may be acquired. He should be able to converse readily in both French and German, and should attend a few lectures in architecture, or read a few good architectural works to get an idea of first principles. Finally, he should be a careful reader of the technical journals.

On graduation he should begin the acquisition of experience, going from one job to another, staying in one place only long enough to get the more evident of the fine points involved, and then on to another until he has done work in each branch. He should join the technical societies in the junior grades for the further carrying out of this purpose. During this period he will have rubbed against many men and should have learned to make himself agreeable to all; he will have formed many acquaintances and heard many practical talks. Finally, he should trace for a time in an architect's office, and when he thinks he has become sufficiently posted to be able to write a good specification, evolve one from his inner consciousness and compare it with one written by a competent man, to see how many things he has left out, and how much he still has to learn. Then he should finish off as the assistant of some good domestic engineer for six months or a year. If the material is in him, he will then be able to stand alone in responsible charge of work. He should have learned to control his temper at all times and under all conditions and never to announce a decision until it has been carefully studied, and then not to change it until at least twice as much time has been given to it as was given originally.

It might be well if he could try his hand at architecture in a small way so as to learn practically how great are the annoyances and how many the details that have to be looked after. This would make him appreciate better the trials of the artist.

The architect, on the other hand, requires a thorough training to fit him for the proper discharge of his duties. These are not only the drawing of a pretty picture, but the building of a substantial, handsome, and economical building that will meet all the requirements of its use, and that will be erected at a reasonable cost and in a reasonable time. He must also be sufficiently posted in construction, so that during the period of small things he will be able to do fairly good construction and know when his knowledge is at an end and an expert's knowledge is desirable or necessary. He must not lose sight of the art in his work, as this is of prime importance, and he must therefore spend his time principally in improvement in this line. Habits of exact thought, logical reasoning, and concentrated effort should be acquired, and he should be especially drilled to a realisation of the necessity of regarding all commissions in their true relative importance. This ground has been well covered in a paper by Professor Ware, of Columbia College, which affords an excellent basis on which to start a discussion of what the architect should be taught. So instructed, the architect would be prepared to regard the engineer more as a co-labourer than as a necessary evil, thus making their relations of a pleasanter nature.

Having now determined the knowledge that the architect and the engineer should each have, it remains to so apply it that the result of their joint labours shall be the best possible under any given conditions, for it must be borne in mind that there was never yet a problem in architecture capable of a solution that was, in every particular, the very best possible. There must always be something that could be better were it not for something else that must be considered.

We are accustomed to think that, when the architect is the principal in a building in which the constructive features compose at least 75 per cent. of the work, it is a case of "the tail wagging the dog." But if we should examine the work of some man who so believes, being accompanied by a good critic, we will find in every part of the work evidences of that neglect of proportion that makes all the difference between a good job and a botch. The writer knows of instances where many thousands of dollars were spent after the building of a house, to get it into better proportion.

There is also the other extreme, in which the architect sacrifices everything else for a certain effect that could have been obtained in a different way at a saving of many thousands of dollars to the client. Each of these cases really only illustrates our human weaknesses and shows how necessary it is that there should be two minds of differing characteristics, examining each problem to insure against such blunders. Then we should have each one doing that share of the work that he was best

fitted for, which in practice might reduce itself to this procedure:—

When a client entrusted a commission to an architect, he would first confer with the business man—practical man or engineer or whatever else he may be called—discussing the entire problem. Then the business man would discuss it with the artist, thus acting as the interpreter or intermediary between the very practical client and the artist. When the preliminary studies were completed, they would see the client together to discuss them, thus saving a lot of unnecessary study, work and talk, effecting a considerable saving of time and minimising the likelihood of blunders. If the client were more artistic than businesslike, then the procedure might be reversed, the artist being consulted before the business man.

This method is advised because all good architecture must be the result of a course of reasoning—the requirements of the work and the limitations of the site giving the plan, the plan speaking or outlining the elevations, and the character of the elevations fixing the detail. It is true that a building for a given purpose may be designed in a dozen different ways, but that difference will be like the difference between the individuals of a family rather than that between individuals of different families. It is necessary, therefore, that the requirements should be determined as exactly as possible to enable the artist to study his plan intelligently, and for this purpose the engineer's training should better fit him. The writer's experience makes him sanguine that the harmonious working of the two interests in some such way as is here outlined will soon become quite general, to the great advantage of the artist, the engineer and the general public.

The general public is also deeply interested in this question, since the buildings that such a combination would design and erect would be a decided advance on the usual thing. This is self-evident when it is stated, but it is rarely permitted to influence the choice of an architect, who is oftener selected because he is a good fellow, or a good artist, or is fashionable, or has the vogue, but not because his office force embraces a specialist for the solution of each of the problems, or because it is organised so as to handle everything in a strictly business way. Of course, we do reap a benefit from all of this in the friends that it is bound to make for us, but this is only because the results are satisfactory, and if the client should be of such a peculiar nature as to be constantly obstructing, then the results would not be so good, and the friction that would result in getting anything like a satisfactory result would make the client complain of a particularly good piece of work as much as if it were badly done.

If clients would recognise that the architect's best work is always done when in competition with himself, that the best man or firm for them to employ is that one whose work in its general character is most pleasing to them, and whose methods are such as to give the most satisfactory results, there would be far less trouble in the end, and the results would be buildings better adapted for their requirements. This would especially be productive of better results than the method for the choice of an architect outlined by Mr. Bernard McEvoy in the January number of the *Engineers' Magazine*. While this subject could better be treated in a separate article, still it seems appropriate to call attention to some of the more evident of the objections to Mr. McEvoy's plan of competition for selecting an architect.

First, the demand for detail in the study of the plans for the purpose of making the heating, sanitary and ventilation arrangements of any value, is such as to result in its exclusion from any terms of competition that a well-equipped architect would enter into unless he were well paid. With the terms thus modified the work could be competed for by any office boy who could handle a pencil, and this would result in the exclusion of the good men. Their demand for details to a $\frac{1}{8}$ -inch scale means nothing, since the scale is too small to be of any value for any purpose, and would only add work that would have to be done over again when the work was actually begun. Finally, such complete plans, assuming that they were drawn in good faith, without the expectation of any further study—a condition that would be impossible of fulfilment in any good office—would be still of no use, since there would be surely some detail that would be susceptible of improvement after Mr. McEvoy's committee and the architect had conferred together. It is the writer's belief that competitions are absolutely wrong in principle, that they are as much out of place in architecture as they would be in medicine, and that every architect should do his best to discourage them unless they could be so managed as to occupy a position analogous to that of a consultation of physicians.

After all, the results that we hope for must be the fruition of a growth of public sentiment having its birth among the professional men, then spreading through the medium of the technical press and technical societies until the end is attained. That our ideal is possible of accomplishment is certain, since we ask for no more than is accorded freely to the other professions, except in matters that we are remedying of our own

volution. When this is done, when artist and engineer labour harmoniously for the one end, forgetting everything but the result aimed at, and are intelligently seconded by the client, we will repeat in every city in the land, in a small scale, the splendid achievement of the White City on the shores of Lake Michigan.

THE LONDON SCHOOL BOARD COMPETITION.

THE following instructions to architects in reference to the approaching competition, prepared by Mr. Macvicar Anderson, have been approved by the Works Committee:—

The School Board for London propose to erect a school on a site in the parish of Plumstead known as the Speranza Road site, and they have resolved to invite architects to submit competitive designs for the same on the following conditions, viz.:—

1. A block plan of the site is supplied herewith to each competitor. The area available for school buildings, outbuildings, playgrounds and boundary walls is indicated by the light red tint and the figured dimensions. The levels are also indicated, and both the area as figured and the levels are to be taken as officially correct. The position and depth of available sewers are also indicated. The approaches are from Speranza Road and Saunders Road, and it is believed that there are no limitations in respect of ancient lights.

2. The buildings are to be designed so as to be thoroughly adapted to the work of school-teaching. Great importance will be attached to the excellence of the plan, the arrangements of which should completely satisfy the latest and most approved requirements of Board schools in London, and must be subject to and in strict conformity with the rules of the Education Department for planning and fitting up public elementary schools.

3. The school is to be designed to accommodate 1,200 children with all necessary classrooms, teachers' rooms, staircases, entrances, cloak-rooms, as well as lavatories and conveniences for both sexes. The usual proportion of 360 boys, 360 girls and 480 infants in such a school is regulated by the plan frequently adopted of placing one department over another in a three-storey building. Competitors are to understand, however, that they are not in any way bound to adopt this or any other plan, as it is desired that they should be left perfectly unrestricted in the treatment of the problem so long as they conform to the rules of the Education Department. In the event of the plan of a three-storey building being adopted, a separate hall must be provided for each of the three departments, but in the case of a one-storey building one hall only need be provided for the use of the whole school. The plan is to embrace a drawing classroom so arranged as to be accessible both for boys and girls, and with this exception no special or technical classrooms are required. A teacher's residence is not to be provided, but a schoolkeeper's house must be shown, also playgrounds and boundary walls. The conveniences for the two sexes must be apart from each other.

4. The following particulars are required in illustration of each design, and neither more nor less will be allowed, viz.:—

A block plan of the site, indicating the position of the school buildings, outbuildings, playgrounds, boundary walls, entrances and the arrangement, position, sizes and fall of the drains. A plan of each floor, both of the school buildings (the ground floor embracing the conveniences for both sexes) and schoolkeeper's house. On these plans the means of possible enlargement, so as to accommodate 1,600 children in all, are to be indicated by blue lines, such enlargement being shown on the plans only, and not on the elevations and sections. The plans are not to have any dimensions figured on them.

A plan of the roofs.

Elevations of the principal fronts of the buildings.

Sections—four in number.

The proposed methods of warming and ventilation are to be indicated on the drawings so far as may be practicable.

All the drawings are to be to the scale of 8 feet to 1 inch, except the block plan, which is to be to the scale of 20 feet to 1 inch.

No perspective views will be allowed.

No alternative design or alternative treatment of part of a design will be allowed, each competitor being restricted to one design only. The drawings are to be in ink, the walls on plans and sections are to be coloured red, the floor area on plans is to be tinted with a light wash of yellow, the woodwork on sections is to be tinted yellow, and the elevations are to be in pen and ink without colour of any kind. The drawings are to be on white paper of uniform size, each 30 inches by 22 inches, mounted on plain stretchers without frames or borders, the front of the stretchers being covered by the drawings.

5. The character of the architecture and the nature of the materials are left to the discretion of competitors, provided that in regard to the latter there is nothing that conflicts with the rules of the Education Department.

6. Each design is to be accompanied by a report giving a general description of the scheme and of the materials proposed to be employed, as well as of the suggested methods of warming, ventilation and sanitation. For the general guidance of competitors the standard specification of the School Board is appended hereto as schedule No. 3.

7. Each competitor is to submit an estimate of the probable cost of his design, including school buildings, outbuildings, boundary walls, playgrounds, desks, forms, fittings and furniture, and every branch and description of work required to complete the school ready for occupation. The cost must not in any case exceed the amount which the Education Department would grant as a loan, the basis of which is set forth in the Schedule No. 2 attached hereto. In pursuance therewith the estimate is to be stated thus:—

Cost of works, including the percentages (i) to (k) allowed by the Education Department, but exclusive of the items (a) to (h) in Schedule No. 2	£
Separate cost of items (a) to (h)	£

Total amount of estimate	£
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8. The names and identity of competitors shall in no way appear. Each design is to be accompanied by a sealed envelope, containing the name and address of the author. Neither the drawings nor the envelopes are to bear any motto, device or distinguishing mark, but they will be numbered on delivery in the order in which they are received.

9. The School Board have appointed Mr. J. Macvicar Anderson, 6 Stratton Street, W., president of the Royal Institute of British Architects, to be their professional assessor and adviser in the competition.

10. The competitor whose design is placed first in point of merit by the assessor shall be paid a premium of 150*l.*; the competitor whose design is placed second shall be paid a premium of 100*l.*; and the competitor whose design is placed third shall be paid a premium of 50*l.* The first premiated design shall be the property of the Board, and all other designs shall be returned to their respective authors immediately after the public exhibition of the competitive designs, which the Board reserve the right to hold during a period not exceeding two months from the date of the award. The competitor to whom the first premium is awarded shall, in the event of the Board erecting the school shown on his plans, be employed as architect, and shall be paid in accordance with the schedule of professional charges published by the Royal Institute of British Architects, such payment being additional to the premium of 150*l.*

11. A deposit of one guinea will be required for supplying the instructions and particulars, which will be returned after the award has been made (should the applicant submit a design), or should he decline to compete and return the instructions and particulars within one month from the date of receiving them.

12. The following will be deemed by the assessor to be grounds for disqualification, viz.:—

(a) Any attempt on the part of a competitor to make known his identity, or to influence the decision of the assessor, personally, or through any member of the Board, or otherwise.

(b) The delivery of a design after the specified time, unless arising from accident in transmission, explained to the satisfaction of the Board.

(c) Any encroachment, however slight, beyond the limitations of the site as laid down and figured on the accompanying plan referred to in Clause 1.

(d) Non-compliance with the conditions respecting the drawings required, whether as to number, scale or style of execution.

(e) Material excess of cost in the opinion of the assessor beyond the outlay that would be sanctioned by the Education Department, referred to in Clause 7.

(f) Departure from, or non-compliance with, any of the conditions embodied in the foregoing instructions, the whole of which will be rigidly adhered to and enforced.

13. The parcel containing the drawings, report and estimate of each competitor, and the sealed envelope which is to accompany it, are to be addressed to

The Clerk of the Board,
School Board for London,
Victoria Embankment, W.C.,

and are to be delivered not earlier than May 29, and not later than June 5, 1893, between the hours of 11 A.M. and 4 P.M.

SCHEDULE NO. 1.

Rules of the Education Department for planning and fitting up public elementary schools, as set out in Schedule 7 of the code of regulations issued by the Education Department.

(Separate document.)

SCHEDULE NO. 2.

Statement of the conditions on which the Education Department authorise the Board to borrow money for the erection of schools.

* The Education Department grant a loan for each school not exceeding 10*l.* per head for each child accommodated, the accommodation being the number of places for which the plans, arranged in accordance with the rules of the Department, are approved. In the infants' department this accommodation is reckoned by dividing the superficial floor area of the rooms by eight, thus allowing 8 square feet for each child. In the boys' and girls' departments the arrangement of the desks, which is approved by the Education Department, usually works out to an area of between 10 and 11 square feet for each child.

The following expenditure need not be included in the limit of 10*l.* per head, viz. :—

(a) Foundations exceeding 4 or 5 feet in depth.
(b) Teachers' rooms, for which an allowance of 100*l.* per room is made.

(c) Drawing classrooms, for which an allowance of 1*l.* per foot super. of floor space is allowed.

(d) Schoolkeeper's house, for which an allowance of 400*l.* is made.

(e) Boundary walls, gates and tar-pavement of playground, the whole cost of which is specially allowed.

(f) Halls provided in connection with the school, for which an allowance of 1*l.* per foot super. of floor space is made.

(g) Glazed bricks, the entire cost of which is allowed.

(h) Playgrounds provided on the roof or underneath the school, where the site is of a very restricted area, the extra cost of which is allowed.

The limit of 10*l.* per head is, however, inclusive of the following percentages, viz. :—

(i) 5 per cent. on the contract amount for possible extras.

(j) 3½ per cent. on the contract amount for the expenses of the architect's department and the cost of the clerk of works, &c.

(k) 12*s.* 6*d.* per head (equivalent to about 7½ per cent. of the contract amount) for the provision of the furniture.

The net cost of the school buildings, therefore, exclusive of the items (a) to (h), should not exceed 8*l.* 12*s.* 6*d.* per head, so that with the above percentages (i) to (k) added, the limit of 10*l.* per head will not be exceeded.

SCHEDULE NO. 3.

Standard Specification (*Separate document*).

THE W. H. SMITH MEMORIAL WINDOW.

THE memorial window to the late Right Hon. W. H. Smith, in St. Margaret's Church, Westminster, subscribed for by members of the House of Commons, was unveiled on Saturday afternoon by Mr. Balfour. The subjects of the window, as suggested by Archdeacon Farrar, represent, in the central light, the figure of our Lord as the Light of the World, with right hand raised to bless, and with emblems of the powers of darkness under His feet, after the conception of the statue of Le Beau Dieu in Amiens Cathedral. In the light on the left hand is the figure of the centurion Cornelius kneeling in prayer, and in that to the right, Nathaniel is seated in contemplation beneath the fig-tree. In smaller panels below are predella pictures, on the left of King David playing the harp, in the centre Moses bearing the Tables of Commandments, and on the right Nehemiah superintending the building of the walls of Jerusalem. The cartoons were prepared by Mr. H. G. Murray, from sketches and studies of the principal figures by Miss Maud Seddon, after the design by Mr. J. P. Seddon.

Mr. Balfour, in a short speech, referred in appreciative terms to the character and career of Mr. Smith.

TESSERÆ.

The Early Abbey of Westminster.

ALL we know of the earliest history of the fabric is that there existed a church in the days of King Offa, and that this (or a successor of it) was rebuilt, and the abbey refounded by Edward the Confessor. One of the first thoughts which occur to us in considering the history of the Abbey is then the question as to what kind of church was that which preceded the present structure, and which we know to have been erected by this sainted monarch. As, for example, what was its size and form? Was it on the small scale which appears to have been common among Saxon buildings, or of the gigantic dimensions adopted by the Normans? And, again, was its architecture more on the Saxon or on the Norman type? William of Malmesbury, writing in the following century, speaks of it as "that church which he the first in England had erected in that mode of composition which now nearly all emulate in its costly expenditure," or, in other words, it was the earliest Norman church. Matthew Paris, in the thirteenth century, merely adapts the same statement to his own times, saying that the Confessor "was buried in the church which he had constructed in that mode of composition from which many of those after-

wards constructing churches, taking example, had emulated in its costly expenditure," evidently considering its style the same as that of the Norman churches with which he was surrounded. Sir Christopher Wren gives us, as he says, from an ancient manuscript, the following particulars :—"The principal area or nave of the church, being raised high and vaulted with square and uniform ribs, is turned circular to the east. This on each side is strongly fortified with a double vaulting of the aisles in two storeys, with their pillars and arches. The cross building, contrived to contain the choir in the middle, and the better to support the lofty tower, rose with a plainer and lower vaulting, which tower, then spreading with artificial winding stairs, was continued with plain walls to its timber roof, which was well covered with lead." From the above one would by no means infer that the church was of small dimensions, and it may have been nearly, or quite, as large in its elementary scale as the present structure. Edward the Confessor having spent so much of his early life in Normandy, it is unlikely that he should be content with the dimensions of a Saxon church. Indeed, had he been so, he had one to his hand without building a new one; and, as he was greatly enlarging the monastic establishment, it seems probable that in rebuilding the abbey church he would adopt the scale which was becoming common in England.

Dry Rot in Timber.

Seasoned or unseasoned timber alike are exposed to the cause of decay specially known by the name of dry rot, which is considered to arise from the development of several species of fungoid growth in the wood; or, according to Dr. Birkbeck, of the *Boletus*, *Agaricus*, *Lycoperdon*, *Mucor*, &c. It would seem as though some of the organic tissues of the wood (not the sap) decomposed under certain conditions of the surrounding atmosphere (as in close, damp, confined air), and that they thus furnish, as it were, a soil for the growth of the fungi, which in turn disintegrated the remaining portions of the tissues by their mere mechanical expansion in growing. The wood becomes, in fact, reduced to a mere powder, and may then be rubbed away by the finger, sometimes with a rapidity quite alarming. There is also this particular danger about dry-rot, viz. that the germs of the fungi producing it are carried easily and in all directions in a building wherein it once displays itself, without necessity for actual contact between the affected or the sound wood, whereas the communication of the disease resulting from the putrefactive fermentation, or wet-rot, only takes place by actual contact. It may possibly be the case that woods grown in certain soils are more exposed to dry-rot than others are, and that the germs of the fungoids are taken up by the spongioses of the roots; for timber grown in situations where large fungi abound are said to be more exposed to this disease (dry-rot) than those which are grown on dry, well-drained soils. At any rate, wood kept for any length of time in situations where it is exposed to become covered with fungi is very likely "to take on" dry-rot at an early period. Much of the timber arriving from the north of Europe leaves the ships in a state which seems to contain the germs of decay. The method of stacking the timber and deals in some of our docks is also often very dangerous. From whatsoever source the fungoid growth producing dry-rot may proceed, if once it should be recognised to exist in a building, the affected parts, and all the woodwork around them, should at once be removed. If the various processes for preserving timber should not then be applicable, great precautions should be observed to cut off the access of moisture and to insure a free circulation of air around the newly-fixed wood.

Sir C. Barry and Birmingham.

In response to the advertisement issued at the close of 1830 calling for designs for the Birmingham Town Hall, Barry forwarded a noble scheme for a Doric temple of grandeur, and at the same time of so much simplicity that his friends confidently averred that it might well be carried out for the 18,000*l.* which formed the limit fixed by the committee. Barry's plan was so long placed in the ascendant that he confidently reckoned on being employed to execute it. From first, however, it somehow sank down to third, and a design was at last adopted which, after utterly ruining the contractors, cost the corporation nearly double the amount to which they at first limited the outlay. Barry exhibited his design, which was much admired, in 1832. Nothing daunted by his bad luck with the town hall, Barry sent in designs (for the preparation of which two months only had been allowed) on November 1, 1832, for the Free Grammar School, commonly known as King Edward's, at Birmingham, which he won easily. This popular building, with its seven regular bays and bay windows breaking through two storeys at each end, was most carefully carried out in every detail and in a good collegiate style, in that most beautiful building stone Darley Dale, and gave great satisfaction. It was completed in 1837 at a cost of 39,263*l.* The study bestowed by Barry upon the working out of this building, and consequently upon the Tudor style generally, he found of the greatest possible service to him when subsequently called upon

for the Houses of Parliament competition. It was about the period of the completion of the Birmingham Schools that Barry became acquainted with Welby Pugin, whose talents he always greatly admired.

Magnesian Limestone.

Magnesian limestone is carbonate of lime and magnesia; ordinary limestone is simply carbonate of lime. Just as the common limestone when crystallised is very durable, so magnesian limestone when crystallised (in which case it is composed of equal parts of carbonate of lime and carbonate of magnesia) is in a more compact state than when earthy, and then seems to stand exceedingly well. In the districts where these stones are obtained, the churches built of them centuries ago are quite unaltered. But when the same stones are brought into our London atmosphere, although they appear to be just as good, and are exposed to very much the same influences, they begin at once to decay. It was owing to a neglect of the consideration of this matter that the magnesian limestone of Bolsover, used in the construction of the Houses of Parliament, has suffered so much. Magnesian limestone differs from common limestone in the way in which it decays. Whenever the two minerals are not perfectly crystallised together, it becomes disintegrated and powdery; so that in one block portions are found which are perfectly hard, and other portions near them which are also hard, whilst between them may be portions which are soft, and so disintegrated that the particles might almost be blown away by the wind. This has arisen from the way in which the material was originally crystallised, and from the difficulty that there is in producing a perfect crystallisation in a mass on a large scale in nature.

Measurement of Light Space.

In the measurement and proper distribution of light, several rules have been laid down by various authors, but scarcely any of a satisfactory nature. Palladio mentions that it appears to him proper, in conformity to the doctrine of Vitruvius, to divide the height of the side of the room into $3\frac{1}{2}$ parts, and to give to the height of the window two of these parts, and to the width one of these parts, less one-sixth. In another part he states that the window space should not be wider than one fourth the width of the room nor narrower than one-fifth, and that the height of each window should be one-sixth more than double its width; but there does not appear to be any rule or suggestion for the number of windows in the side of a room or the width of window opening in proportion to length of room. Morris, who in 1734 published his "Lectures on Architecture," &c., observes:—"Let the magnitude of a room be given. Multiply the length and breadth of the room together, and that product multiply by the height, and the square root of that sum will be the superficial contents in feet of the light space required." Gwilt, in his "Encyclopædia," allows one foot of glass to 100 cubic feet of room.

Encaustic Painting.

Encaustic painting in some form dates from the most remote antiquity. Sir Gardner Wilkinson states that "encaustic painting, with wax and naphtha as vehicles, was practised among the Egyptians," but there seems some doubt about the actual processes of its employment; it is enough, however, to know that wax was one of the ingredients used, and most likely the preservation of the examples noticed has been due to this. The Greeks practised it from a very early period. Pliny says of it:—"We employ wax as a vehicle of painting, not only from the beauty it gives to the pictures painted with it, but also because it is a preservative of the walls which it adorns;" and in another place that "Lysippus, the painter, executed a work of this kind at Egina, and that he put an inscription under it, stating that he had himself subjected the work to the action of fire." This proves that the ancient encaustic was really burnt in, as its name implies. Among the Romans encaustic painting, or at any rate painting with wax in some form, was very general; and it continued to be practised during the early centuries of Christianity, almost to the exclusion of every other mode, but after that time it seems to have fallen into disuse. Wax is not mentioned by Cennini, writing in 1437, except as a material for modelling, whence we may conclude that in his day the art had been lost; and Theophilus makes no allusion to it whatever. Lanzi mentions that "many old pictures were analysed by the celebrated chemist Pietro Bianchi, and they appeared to be painted in oil; and it was found that the oldest pictures, which were usually the most brilliant, gave indications of wax, but that no wax was found in pictures painted after the year 1360." In the appendix to the third report of the Commissioners on the Fine Arts, published in 1844, there is a description of "Methods of Painting adapted to Mural Decoration," by Sir Charles Eastlake, in which he says, speaking of encaustic:—"The precise process of this art among the ancients has been the subject of much controversy; but the actual remains of antique painting at Pompeii and Herculaneum, as well as numerous allusions in the writings of the ancients, prove that it was common among the Greeks and Romans. It was also occasionally employed during the Middle Ages." And again,

as the result of his own observation, he says:—"The advantage of wax as a vehicle is its durability. A wall painted white, partly with wax and partly with oil, exhibits the same tint for some days, but by degrees the oil colour darkens, and after some months the two portions are quite distinct; that which was painted in wax retaining all its brilliancy." He also quotes a description of the nature and advantages of wax as adapted for general painting by Dr. Roux, who observes:—"Colours, mixed with wax are entirely saturated by it. Wax and colours form together a more solid, less fusible substance than wax alone. The pigments remain closely united with the wax. No skin appears on the surface of the picture, even when the wax has been mixed in abundance with the colours."

Alan de Walsingham.

It may not have occurred to everyone who has admired the beauties of Ely Cathedral to think, or rather some may not have had the opportunity of knowing, that the principal Mediæval glories of Ely, perhaps the whole, were home-grown. The names of the architects of all the great works are not known; but the architect of the most remarkable portion, the central octagon and lantern, was undoubtedly a monk of the convent, Alan de Walsingham. It may be supposed from his name that he was not born in the isle, but came from Walsingham, in Norfolk, a place in those days much more famous than now. He would probably have come from his native village as a boy to Ely, and would never have gone much beyond the bounds of the convent, except to see those farms of which he had the care as a sacrist. But he was a man of genius, and circumstances favoured the development of his genius, though in a singular way. First he showed his love of art by making himself a goldsmith, and then he indulged the same love by turning architect. Many opportunities he found for the exercise of this art; in fact, the good old monk seems to have been constantly building one thing or another. He designed the lady chapel; he built that exquisite little gem called Prior Crawden's chapel and several other buildings of less note, but the grand opportunity for exhibiting his full powers occurred when the old central Norman tower fell in 1320. "It is an ill wind that blows nobody any good," and though the fall of the tower nearly frightened the monks out of their wits and emptied their pockets, it was (as we say) the "making" of Alan de Walsingham. Never was there a better opening, and Alan perceived it. He determined that he would have no more heavy towers, threatening to come down and keeping up a reign of terror, but he would recast the whole structure of the cathedral; and so he introduced that beautiful octagon which has been ever since one of the chief features of the building, and which may be reckoned amongst the prime results of Mediæval architectural skill.

Circular Churches.

The circular form of the Holy Sepulchre built by the Empress Helena at Jerusalem, rebuilt by Charlemagne in 813, was caused by its erection round a tomb: octagonal churches, such as those of Antioch and Nazianzum, like baptisteries, were built on symbolical designs. The church erected on the Mount of Ascension powerfully affected the Eastern mind, and became a model for similar buildings, the domes of which were inscribed with the grand words of the angelic salutation to the apostles. The dome was a necessary constructional development as the fittest covering for a round building. Constantine built the first round churches in the West, those of St. Constance and SS. Peter and Marcellinus, at Rome. In the interior of the latter and of St. George, Salonica, built by him, with its seven trigonal chapels; in those of the Holy Sepulchre; and in the eight little apses of the Church of the Apostles, at Athens; and of St. Vitalis at Ravenna, built by Justinian, we observe a singular resemblance to the chevet with its radiating chapels. An octagonal church, internally circular, occurs at Hierapolis, of an early date. Circular and polygonal churches are also frequent in Armenia. That of Etchmiadsin is a square, with a central dome and apses to each arm of the internally marked cross. In the Church of the Apostles at Constantinople, Constantine adopted the form of the Latin cross, as in the church of St. John Studius, and a central dome above the sanctuary; the nave had timber roof. However, the necessary construction of four pillars to carry the dome, and of vaults to the nave and transepts, led to the abandonment of the flat ceilings and roofs of the Latins. The circle or polygon was thus combined with the Latin cross, and the gammada or Greek cross arose from the combination of four gammas, the numeral designating the Holy Trinity. Arculphus describes a church of this form at Sichem, in the seventh century. The cupola in time was extravagantly developed, and the aisles reduced to narrow passages in the time of Justinian. St. Sophia, consecrated A.D. 557—of which the Emperor Justinian said, with a burst of emotion, "I have equalled thee, O Solomon!"—forms a square with an eastern apse and a central cupola, and the form of the cross is formed internally by two square halls on either side of the dome; a portico ranges along the entire front of the building, as at St. Vitalis, Ravenna.

NOTES AND COMMENTS.

IN his last report the Director of the National Gallery states the attention of the Treasury has been often called to the urgent necessity for enlarging the Gallery with the object of providing adequate accommodation for recently-acquired pictures in this collection. Although no definite answer has been received on this subject by the Board, the trustees and director observe with satisfaction that their request has not been overlooked. During an interview with a deputation from unemployed workmen in London on November 28 last, the First Commissioner of Her Majesty's Works stated that "a portion of the site formerly occupied by Millbank Prison would be exchanged with the War Office for land immediately behind the National Gallery and now occupied by barracks, and that the land thus set free would be available for the extension of the National Gallery, which could not be delayed much longer." Should this exchange be effected, the trustees and director suggest that it would not be necessary to postpone the commencement of building operations at the National Gallery until St. George's Barracks have been removed to the Millbank site. Even after devoting part of the present barrack-yard to the purpose required, a considerable space would still remain available as a temporary drill-ground, and in view of the fact that at least two or three years must elapse before the proposed additions to the National Gallery could be erected and ready for occupation, it is hoped that the preliminary work for those additions may be undertaken at the earliest possible date. The purchases during the past year are a painting by JAN VERMEER, of Delft—*A Young Lady at a Spinet*—which cost 2,400*l.*, and *Portraits of his Servants*, by WILLIAM HOGARTH, costing 162*l.* 15*s.* The donations numbered thirty-six. The number of visitors in the past year were 505,787, being a daily average of 2,443. On students' days there were 23,991 attendances, the daily average being 193 for oil-colours and 40 for water-colours. Four hundred and sixty-seven copies were made from foreign masters and 626 from British and modern masters.

IT would have some interest if we knew how often pictures were copied in the National Gallery for vending and how often for study. The twelve copies made of GREUZE'S *Girl with an Apple* and of *Head of a Girl*, we may assume, soon found purchasers, but who are the twelve amateurs for whom the copies of the *Vision of St. Helena*, by CAGLIARI, were ordered? Portraits of unknown persons are in demand. Eleven copies were taken from VANDYKE'S *Portrait of a Gentleman*, nine of FRANZ HALS'S *A Man's Portrait*, nine of REMBRANDT'S *Man's Portrait* and nine of his *Portrait of an Old Lady*. Of MORONI'S *Portrait of a Lawyer* seven copies were taken, and although the *Admiral Pulido Pareja*, by VELASQUEZ, is only a recent arrival in the Gallery, six copies of it were produced. ROMNEY'S *Lady Hamilton* is first favourite among the English portraits, for it was copied fifteen times, and his *Parson's Daughter* comes next with thirteen. Twelve copies were taken from GAINSBOROUGH'S *Portrait of a Young Man*. As year after year there is a similar preference for portraiture among the copyists, it is difficult to resist the doubt that the National Gallery is an aid to the production of family portraits. Let a man become wealthy, he will have no difficulty in discovering figures that will serve instead of ancestors and heraldic signs that will be a substitute for armorial bearings.

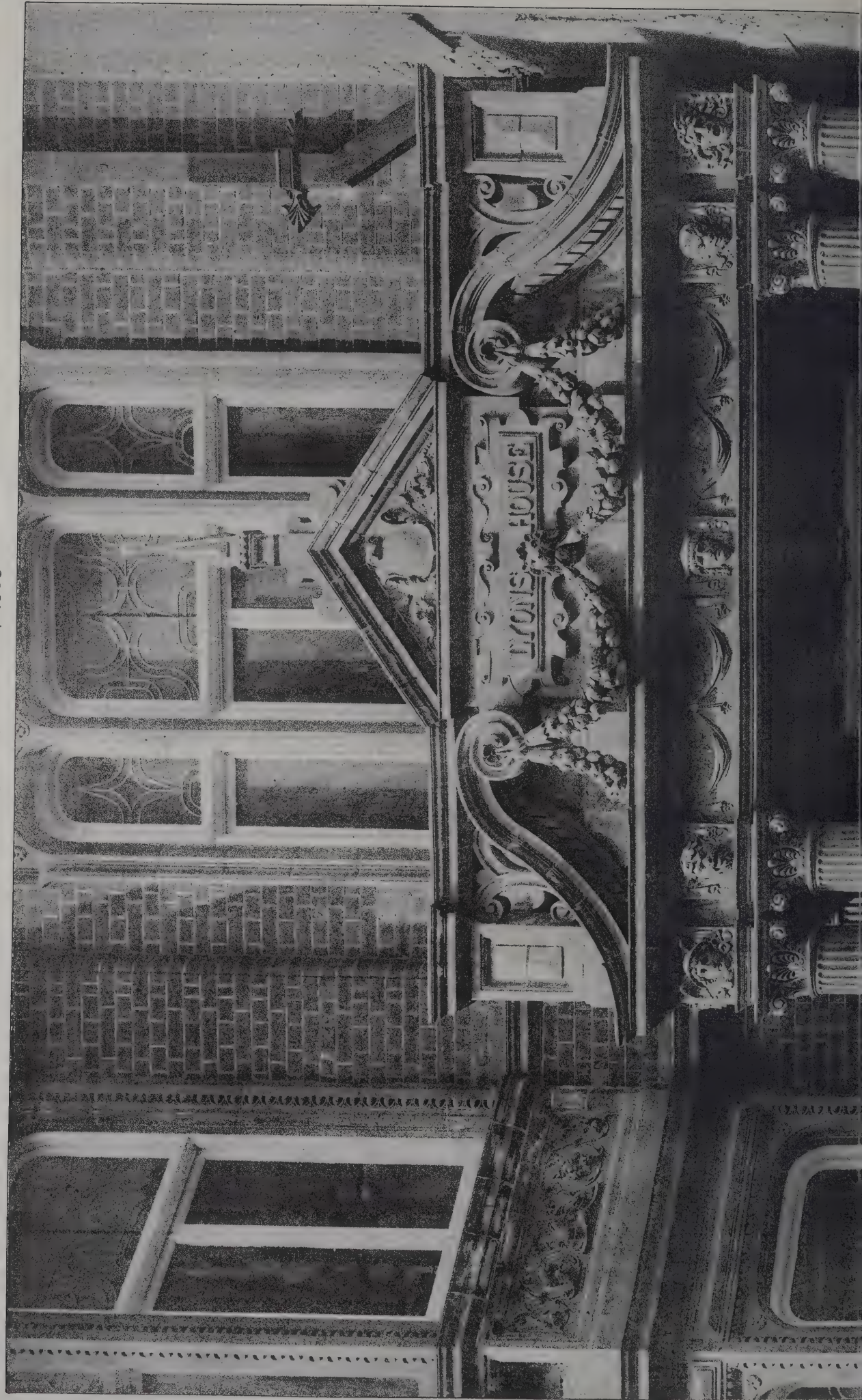
THERE are many legends associated with the fate of Troy which painters have neglected. Among them is that of HESIONE. She was the daughter of LAOMEDON, who was PRIAM'S predecessor. Like many men in all ages, LAOMEDON was ungrateful to a firm of builders who, by their works of masonry and earthworks, gave security to his city. He declined to carry out his agreement with them when the work was accomplished. But APOLLO and NEPTUNE (for they were the partners in the contract) were more powerful than he imagined. They could assess their own damages. APOLLO pleased himself by inflicting a pestilence. NEPTUNE demanded a victim for a favourite monster, and HESIONE was selected. HERCULES happened

to see her while he was on a filibustering expedition to Colchis with the Argonauts; he rescued the princess and destroyed the monster. LAOMEDON, out of gratitude, offered his racehorses to the hero. HESIONE wished to accompany the expedition, but it was decided that she was to remain in Troy, and the horses also, until the return from Colchis. A man who is dishonest in his building transactions never does much good, and when the time came for HERCULES to bring away the horses LAOMEDON would not part with them. HERCULES besieged Troy, killed the king and set PRIAM on the throne; HESIONE was given to TELAMON, the father of AJAX, and was allowed to bring her youngest brother with her. The interest in the story has been revived by the discovery last year of a wall-painting in Pompeii which represents one of the incidents. The subject was discussed at a recent meeting of the German Archaeological Institute in Rome. HESIONE, with her brother and a woman attendant, appear in the painting as if pleading with HERCULES for pity on the boy, who is clad in a dress of blue material. The hero is seated, and besides a lance carries a small crown of leaves. It is supposed that the manumission of the boy is sought, and that it will be granted in the form which was sometimes observed in Rome—that is, by touching him with a lance and placing a wreath on his head. The painting is not in a perfect state, but is sufficiently distinct to enable the subject to be made out, and there is not likely to be any opposition to the interpretation put forward.

FEW churches in Rome are better known than St. Maria in Ara Coeli, which stands on the site of a temple that was dedicated to JUNO, or, as some believe, to JOVE himself. The position on the Capitoline Hill was striking but difficult of access, and accordingly MICHEL ANGELO devised the great flight of steps, the Scala Coeli, which, as our readers are aware, is not an easy climb, for the artist, who was not strong in planning, has not allowed one landing-place to the one hundred and twenty-four steps, which, like so many of the columns within, are made up of materials derived from ancient buildings. The exterior of the church is very plain, for long ago it was despoiled of its mosaic decorations. The interior has interest for painters, for one of the chapels is adorned with frescoes by PINTURICCHIO. These have suffered through the explosion on Monte Verdi, as well as the building itself, but the works of restoration could not be undertaken until some important legal questions were settled. The church has become a national monument, and it was sought to derive the money for the work from the national treasury. When finance is at stake abroad there is an astonishing respect for old rights, and it was argued that the municipality of Rome, or the corporate and religious bodies who at one time held an interest in the church, should have the privilege of paying for the restoration. Even the canon law that is commonly held to be obsolete was appealed to. After discussions between lawyers it was discovered that whoever defrayed the expense might afterwards set up a claim to the ownership. Discretion therefore prevailed over economy with the Italian Government, and it has been decided that at least the frescoes will be restored as a public work, and that the commission will be entrusted to Signor BARTOLUCCI, under the direction of the art committee of the municipality.

THE subject assigned for the first stage in the competition for the Prix de Rome of Architecture was a hippodrome, an opportune subject, for as the building in Paris which bore that title has been removed, a substitute will probably be soon needed. Ninety sketches were submitted by the students of the Ecole des Beaux-Arts. The jury, consisting of MM. GARNIER, Comte DELABORDE, VAUDREMER, GINAIN, COQUART, NORMAND, DAUMET, PASCAL and ANCELET having made a selection, the following students were selected to take part in the second one:—MM. OLIVIER, SCHELLEKOPF, BERNARD (Camille), COLIN (Gaston), RIGAUT, BIGOT, CHARBONNIER, MARS, MAYEUX, PROY, GUESNIER, PRUDON, AUBURTIN, ARNAUD, LAVIROTTE, BERTHIER, GARNIER (Tony), CHESNAY, HULOT and HERAUD. Who can tell how many architects who will gain distinction hereafter are comprised in the list?

The Architect. March 24th 1893

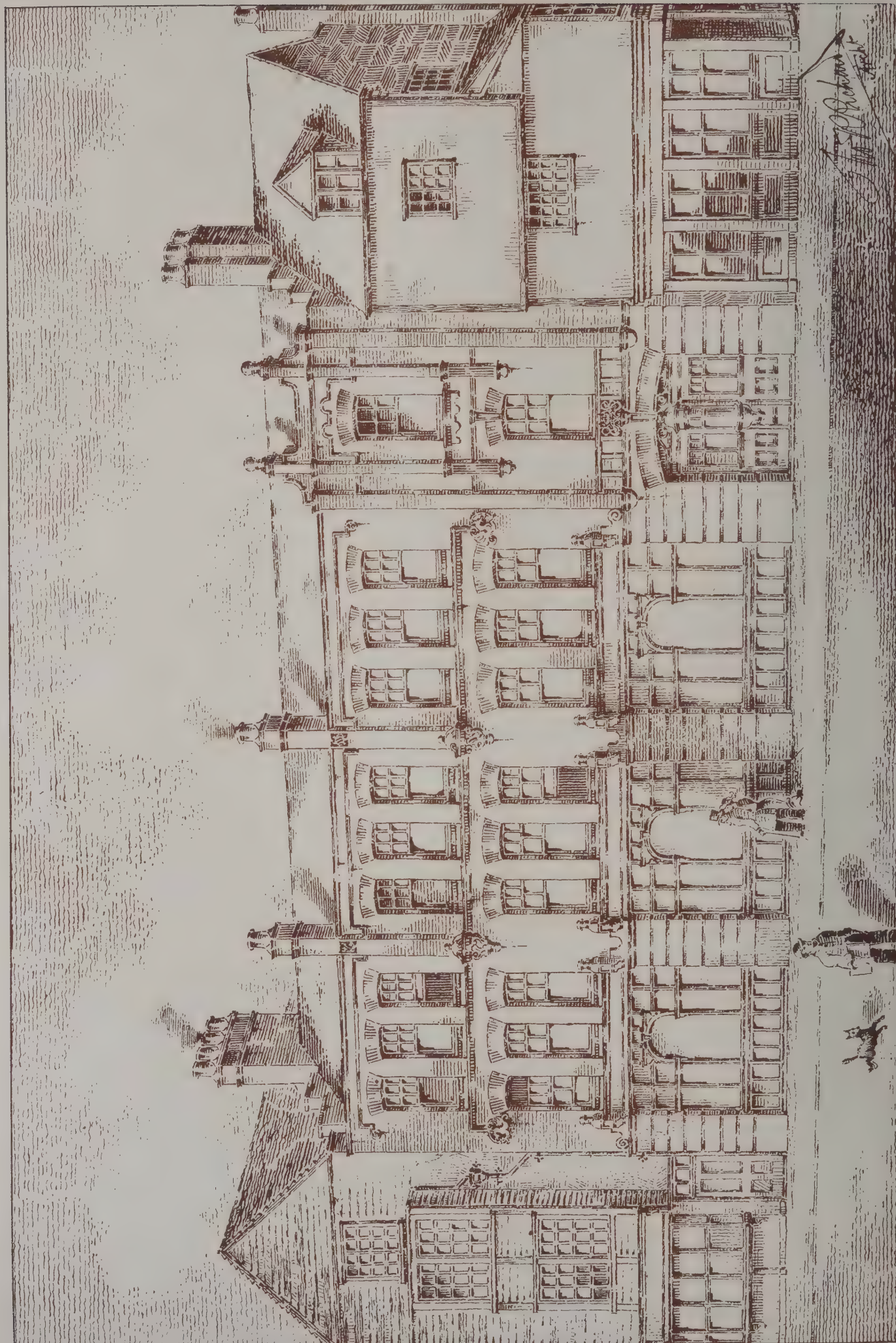




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DOORWAY: LYONS HOUSE, SURREY STREET, STRAND.

JOHN DUNN, Architect.

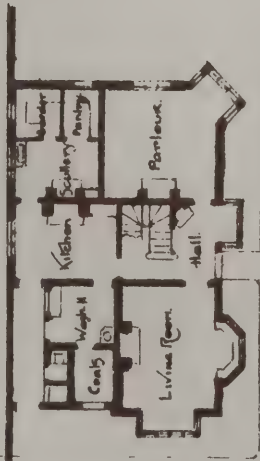


WAREHOUSE: NOS. 12-16 CLOTH FAIR, E.C.

T. R. RICHARDS, Architect.

Printed by J. H. P. & Co. 15, Abchurch Lane, London, E.C. 4.

Ground Plan



The Gardiner's House.
Longford Castle.
Salisbury.



The Amphitheat, March 24th 1893.





INK-PHOTO. SPRAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

THE ENTRANCE HALL, ALTHORP PARK, NORTHAMPTON.

The Seat of EARL SPENCER, K.G.

ILLUSTRATIONS.

DOORWAY, LYONS HOUSE, SURREY STREET.

THE region between the Embankment and the Strand, which forms part of the property of the Duke of NORFOLK, has during the last ten years undergone modifications which are remarkable. The old, commonplace houses have been succeeded by large blocks of buildings exemplifying later Gothic and Renaissance styles. Red brick and terra-cotta have been used, and the effect is enough to surprise anyone who was acquainted with the property a dozen years ago. It is to be regretted, however, that owing to the narrowness of some of the streets the buildings cannot be as much admired as they deserve. It will be seen from the illustration that the detail of the buildings will bear a vigorous scrutiny. The architect is Mr. JOHN DUNN. The illustration is from a photograph by Messrs. B. LEMERE & Co.

ENTRANCE HALL, ALTHORP.

ALTHORP has gained renown from the library enshrined in the house. But like many of the stately homes of England, it is not without architectural merit. The hall, as will be seen, is an example of a time when Italian prevailed, and is not without elegance in the detail, and the panels afford space for subjects which appealed to owners and visitors. The photograph employed was taken by Messrs. B. LEMERE & Co.

WAREHOUSE, 12-16 CLOTH FAIR, E.C.

THIS building is situate on the south side of Cloth Fair, and immediately in the rear of it is the church of St. Bartholomew-the-Great. On the right of the view next the old house shown (No. 11) is the new north transept and porch of the church opening out on this thoroughfare. The old building referred to is being taken down to improve the roadway; at present it projects beyond the new line of frontage. The other old house to the left of the view is No. 17, one of the few houses now remaining in the City having weather-boarded fronts.

The new building has four storeys, and is exceptionally well lighted; there is a good basement extending over the whole of the site. Fireproof floors are laid throughout on Mr. DAWNAY'S system, and he has carried out the constructional ironwork. The fronts are in stocks, with red brick arches, pilasters, mouldings and dressings; the carved work is in red rubbers, with some cut and moulded work; the ground storey is faced with salt-glazed bricks of a deep brown colour.

The whole of the works have been carried out by the builders, Messrs. W. BRASS & SON, of 47 Old Street, E.C., from the designs and under the superintendence of the architect, Mr. T. R. RICHARDS, of 25 Bedford Row, W.C.

GARDENER'S HOUSE, LONGFORD CASTLE, SALISBURY.

THE illustration shows a house just built in the park at Longford Castle by the Earl of RADNOR, for Mr. WARD, the well-known head of the Longford Castle gardens. It is built of local bricks, and roofed with Staffordshire tiles. The gables are of Messrs. LASCELLES' cement. The cost has been 850*l.*, and the work has been carried out by Mr. H. KITE, of Salisbury, from designs by Mr. G. HAMILTON-GORDON, A.R.I.B.A., of the firm of TAYLOR & GORDON.

BRISTOL CATHEDRAL.

THE Dean of Bristol has issued the following statement:—The condition of the fabric of Bristol Cathedral can scarcely be said to be creditable to the important metropolis of the West, in the heart of which it is situate. What meets the eye cannot but suggest unfavourable comparison with cathedrals in other cities of less note and resources. The tower, elder lady chapel and northern side of the cloisters are in a ruinous and even unsafe condition, and call imperatively for restoration. The internal arrangements of the choir are not, as must be allowed, in harmony with those of an ideal cathedral. Much has been done within recent years by the zeal and munificence of the citizens of Bristol in supplying the long-felt want of the spacious nave, the present use of which is

so fully appreciated, and by the addition of the western towers. The successful completion of these two important works affords evidence of the interest which the Christian people of the city take in the ancient and interesting mother church of Bristol.

Yet another effort, not less strenuous and united, is called for to make our cathedral worthy of its position as one of the great historical churches of our land. As the result of a public meeting, held in June, 1892, in the Merchant Venturers' hall, presided over by the bishop of the diocese, and influentially attended, it was resolved that the cathedral should be without delay restored. A committee, composed of prominent clergy and laity, was formed. The plans proposed by the eminent architect, Mr. Pearson, were adopted. Tenders were invited, and the committee have accepted that of Messrs. Cowlin & Son, of Bristol, for the restoration of the tower and lady chapel, the portion of the work requiring to be immediately taken in hand. It is a source of satisfaction to the committee to be able to entrust this to a local firm. They are anxious that the restoration of the cathedral should not be partial, but, as far as possible complete, and that the present opportunity should be used for securing so desirable an end. On the eve, therefore, of the commencement of the work, the committee are of opinion that the time has arrived when a more general and urgent appeal should be made to the citizens of Bristol for subscriptions towards a local object which, on every ground, religious and civic, cannot but commend itself to their active and generous sympathy. The sum required to cover the restoration of the tower, lady chapel, portion of cloisters, the internal rearrangement and fittings of the choir, a new organ and possibly a peal of bells, is approximately estimated at 20,000*l.*, of which about 6,900*l.* has been promised.

The committee are confident that, once begun in earnest, the citizens of Bristol will not allow a work which has for its object the glory of God, the jealous honour of His sanctuary and the enrichment of a city already abounding in proofs of Christian zeal and in specimens of great historic value and architectural beauty, to be impeded for lack of interest or liberal support.

It is obviously impossible in a city of such magnitude as Bristol to reach everyone by private solicitation. There must be many in our midst and elsewhere who, without being thus personally canvassed, will be glad and ready to contribute, either by a donation which, if desired, might be spread over two or three years, or, as has been suggested, in the form of special gifts, *e.g.* a new pulpit, fittings for the choir, stained-glass windows, choir-screen, restoration of the cloisters or some one particular portion of the work with which the name of the donor and occasion of the special gift might be identified.

The committee desire heartily to commend this good work to all who are interested in the preservation and restoration of Bristol Cathedral.

SURREY ARCHÆOLOGICAL SOCIETY.

AT the annual general meeting of the Surrey Archæological Society, Viscount Midleton presided. The annual report stated that in August last the Society received notice from the committee of the Croydon Institute to remove the museum from their buildings. The collection is now temporarily warehoused until some suitable home can be found for it. The number of members was 220 annual, 97 life and 3 honorary. During the year the Society had lost twenty members, and nineteen new members had been elected. The library still continued to increase, not only by the exchange of publications with other societies, but also by donations from members. To Mr. S. W. Kershaw, F.S.A., the Society was greatly indebted for a most valuable gift of books in memory of his brother, the late Mr. W. Kershaw, M.D. This generous gift placed the Society in possession of a complete set of the "Journal of the Royal Archæological Institute." The Council desired to tender to Mr. S. W. Kershaw the best thanks of the Society for this valuable gift. After payment of all outstanding liabilities, there remained a balance on the year's expenditure. The sum of 20*l.* received for life compositions during the year 1892 had been placed on deposit pending investment, but there still remained a sum of 95*l.* due to the reserve fund on this account. As the total reserve fund now amounted to over 400*l.*, and taking into consideration the fact that this sum of 95*l.* had been used during an emergency in the Society's affairs, the Council desired to bring the following resolution before the general meeting:—"That the debt of 95*l.* now owing to the reserved fund on account of life compositions be cancelled." The report was adopted, and the resolution recommended by the Council was agreed to.

Alderman Rymer said it appeared to him most unsatisfactory that the museum should be warehoused. As a Croydon man he should like to see the museum retained at Croydon, and he believed that if applied to, the Church Institute would place a room at the disposal of the Council for the purpose.

Mr. G. C. Williamson pointed out that there was already a

resolution on the books of the Council that the museum should be located at Guildford.

Mr. R. Nevill said that that was so, but there had been some difficulty in regard to obtaining the necessary accommodation at Guildford.

Mr. Williamson replied that the Guildford Corporation had offered a house for the purpose of the collection; and they would have the house on the decease of an old lady who was eighty-eight years of age, but whom the Corporation declined to turn out of the house. Meanwhile, the contents of the Guildford Institute, a larger collection than that of the Society, was also temporarily warehoused, waiting to be added to the Society's collection.

It was decided to adhere to the resolution to eventually place the museum at Guildford.

On the motion of Alderman Rymer a vote of thanks was accorded the President for his valuable services during the past year.

Lord Middleton said the vote was undeserved, for the work of the Society was carried on by the committee, and especially their honorary secretaries, who devoted themselves to the interest of the Society in a manner which was creditable to themselves and fraught with the greatest possible benefit to the Society. He thought they might congratulate themselves on the satisfactory position in which the Society had been placed, and he hoped that every member of the Society would use his utmost endeavours to bring in fresh recruits.

UNEARNED INCREMENT.

AN address on "Unearned Increment" was delivered by Mr. George Auldjo Jamieson to the Chartered Accountants' Society, Edinburgh. Increment, he said, was distinguished from income as the expansion of capital differentiated from its fruit. But it did not follow that increment, though passive, was spontaneous or sporadic. They might have increment due to energy employed in development, though that development might be incomplete and the enterprise as yet, therefore, unproductive. But such increment was not that in which they were concerned. Unearned increment was due to no energy, it was the fruit of no toil, that was to say, labour contributed nothing to its growth. Neither force of energy nor endurance of effort called it into being. Thus defined, the term unearned increment put itself at once into antagonism to some of the axioms of economics. Wealth did not grow spontaneously; wealth was either the wages of labour or the wages of abstinence, or as it was now better defined, the wages of waiting. If, then, wealth could be truly unearned, then all economic teaching was vain, and the foundations of morality were sapped, because they might no longer distinguish between the produce of labour and the winnings of the gambler. What might be regarded as the germ of the idea which had grown into what was called unearned increment was a passage in Adam Smith when he dealt with taxation. To some extent Ricardo followed up the idea, but it was not until after the fierce conflict of the Corn-law agitation had subsided, and when the prognostications of the fall in the value of land were disappointed, that the germ idea of Adam Smith germinated into the programme of the Land Tenure Association, to which in 1870 John Stuart Mill gave the high sanction of his approval and support. Mill's utterances were really the origin and foundation of the unearned increment. Lesser apostles of the creed repeated it, but Mr. Jamieson said it was not necessary for him to adopt the rôle of critic. The inexorable logic of fact had accomplished what no argument could effect. It was easy now to demonstrate why there could be no unearned increment when, as Thorold Rogers had said, there was no increment to call either earned or unearned, but it was rare that so swift and so complete a refutation of an economic fallacy was provided as an object lesson to teach caution and to warn economists against building systems on the fleeting foundation of political passion and prejudice. But it was not to be supposed that because the vast increase on the value of land which took place between 1855 and 1875 had passed away, there was nothing to which, if sound, the theory could apply. The value of land in the vicinity of towns and of new seats of mining or manufacturing industry rapidly rose as the demand for human accommodation increased, and the growth of such values arrested and challenged public attention, and it was from such cases that startling instances of unearned increment were now derived. The bloated landlord had passed away; it was the ground-renter and superior that remained. When a piece of ground was found which had attained a value far beyond its normal and intrinsic value for the primary purpose of agriculture, there were two reasons for, or causes of, the abnormal growth which must be recognised—first, what was called good luck or good fortune; and, second, foresight and skill. What men in usual parlance called good luck and good fortune was in economic language foresight wedded to opportunity. But the main element was that of interest. After justifying the exaction of

interest, he said that the modern bogie man of unearned increment was revealed as the ancient chimera of usury, and that the proposals so frequently made to expropriate the unearned increment were proposals to deny to foresight, skill and abstinence the wages to which they were entitled, just as of old interest was prohibited. There were two points which seized on public sentiment, and obscured the real issues, and on both there had been an unwise obstinacy which had propped up this tottering idol of the market-place. These were the rating of ground-rent and feu duties for municipal purposes, and the taxation of vacant building ground within municipalities. No one in that room would maintain that the taxation of feu duties could affect the community. A house was not more valuable because it was burdened with a feu duty than the adjoining house of the same rent whose owner had acquired the fee simple; but the question which remained was enough to offend public sentiment, although it was a duel only between two classes of owners. Why should the owner of the soil on which a human dwelling was erected be exempt from all charge for protecting that dwelling, and making it safe and fit for human habitation? Because, it was answered, the owner of the building had undertaken to defray all such charges, and to pay the feu-duty free of all deduction. But the contract made was probably made in ignorance on the part of both of the necessity of doing much to make land fit for human habitation that was now found essential. It was not easy to answer the objections, and the attempts to reply had not been very successful, being little more than the protest of those who owned feu duties that they preferred not to be taxed; and the feeling of resentment against the phantom unearned increment was kept alive by the injudicious tone of those who were supposed to enjoy the passive wealth that grew and was not made. The other leg on which the phantom stood was the refusal to assess at its true increment of value unoccupied ground in municipalities—land meant for building—and kept year by year for increased return. There was really no theoretical answer to the demand that such land should be taxed at its true value. The practical difficulty of making it amenable to taxation was very considerable. Such land could not be rated without supplying it with all that the rates provided, and there was a certain unfairness in levying rates from property which as yet required little to be spent on it. But the principle of imaginary rental had been introduced of late, and the principle of classification was reorganised, and uniting these two principles, there should be no difficulty in making unbuilt land contribute its fair share to taxation. It was not salutary in the public interest that the owners of such land should be enabled to bottle it up for future use, exempt from the burden of contributing to those rates to which was in reality attributable its growing value. If these two anomalies were removed, the unearned increment of building land would be buried alongside the late lamented unearned increment of agricultural land, and one of the most remarkable delusions of modern economics would be consigned to the grave, where usury and regulated markets and Acts against forestalling and regrating lay forgotten. For there was no increment that grew, no wealth that was not made; and it was the making of wealth that gave it its value and zest. Whatever emulated creation gratified man; and as there was no matter that was uncreated there was no increment of wealth that was unearned.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

THE PALACE OF THEODORIC AT RAVENNA.

IT was politic on the part of Roman emperors to allow the world to believe that they were surrounded by divine protection while on earth, and in due course were to have thrones among the gods. But personally they were too well convinced that any slave with a bare bodkin could put an end to all their greatness. Ravenna owes its existence to imperial apprehensions. When Alaric and his wild hordes descended on Italy, Honorius the emperor fled from town to town. He declared in the usual royal style, "Nec me timor impulit ullus," but the brave words must have sounded strangely to the guards that surrounded the imperial litter. When Alaric returned to the North, Honorius used the opportunity to provide a refuge for himself in case of another invasion. He fixed upon Ravenna, which possessed the advantage of being surrounded by marshes that in parts remain as difficult to cross as any Irish bog. With all its disadvantages, the place was so difficult to reach that it was no less appreciated by the successors of Honorius, and up to the eighth century Ravenna might be considered as the true capital of Italy. In the great contest between Odoacer

and Theodoric the city was so ably fortified that it sustained a siege of nearly three years, and was at last reduced by famine.

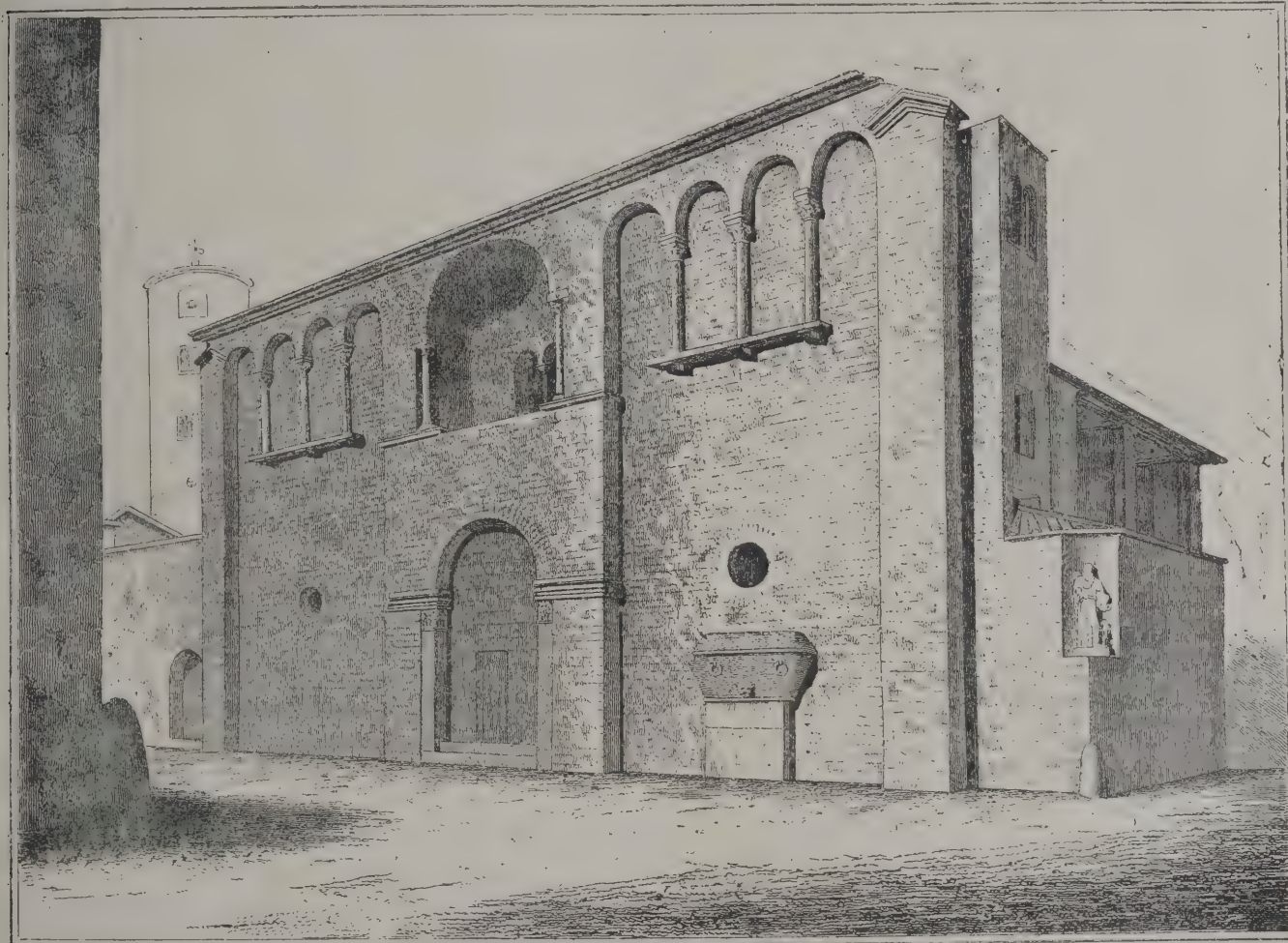
When Theodoric the Ostrogoth ruled in Ravenna it was visited by ambassadors from most countries of Europe, as well as by barbarian chiefs who were equally anxious to secure the friendship or tolerance of the king. Although he had gained his power by arms, during the thirty-three years of his reign he devoted himself to the task of bringing order into chaos by peaceful means. At a time when cultivation of the earth was despised as fitted only for slaves, he worked on his fields. All the arts of peace flourished under him. He enriched with buildings and public works not only Ravenna, which was his capital, but Verona, Pavia, Naples and other cities. On his visit to Rome Theodoric was astounded with the works which remained, and he exerted himself to preserve them. We are told by Gibbon that "edicts were framed to prevent the abuses, the neglect, or the depredations of the citizens themselves; and a professed architect, the annual sum of two hundred pounds in gold, twenty-five thousand tiles, and the receipt of customs from the Lucrine port were assigned for the ordinary repairs of the walls and public edifices. A similar care was extended to the statues of metal or marble of men or animals. The spirit of the horses which have given a modern name to the Quirinal (Monte Cavallo) was applauded by the barbarians; the brazen elephants

nothing in the character of the details which would throw a doubt upon it. In the semi-classic style of the doorway, and in the little arcades against the upper part of the walls, it bears a sufficiently strong resemblance to the tomb of the monarch, of the date of which no reasonable doubt exists.

The palace is described as having been originally of much magnificence and extent, but Charlemagne despoiled it, pulling down and removing with no sparing hand its columns, mosaics and other decorations, in order to contribute to the splendour of those edifices with which he adorned the more favoured parts of his empire. Among the embellishments so removed was an equestrian statue of Theodoric, which was conveyed to Acquisgranæ, or Aix-la-Chapelle.

The façade is built almost wholly of bricks, a material which appears never to have fallen into disuse in Italy, although in England we have little evidence of its having been manufactured for the builder's purposes during a long period of time. The two circular apertures in the lower part of the front appear to be modern; and the porphyry sarcophagus, which is let into the wall on the left of the doorway, is said to have been removed in recent times to that situation, on being found near the mausoleum of this monarch, whose body it was believed to have contained.

The large coved recess or niche over the entrance is a very



THEODORIC'S PALACE AT RAVENNA.

of the Via Sacra were diligently restored; the famous heifer of Myron deceived the cattle as they were driven through the Forum of Peace; and an officer was created to protect those works of art which Theodoric considered as the noblest monument of his kingdom." Lovers of ancient literature will, however, consider that the king's efforts to preserve works of art was a poor compensation for his murder of Boethius, the author of the "Consolation of Philosophy," and who was "the last of the Romans whom Cato or Tully could have acknowledged for their countryman."

One of the famous mosaics in the church of San Apollinare Nuovo, which are supposed to be the work of the sixth century, represents Theodoric's palace in Ravenna. There is a projecting centre of three arches, surmounted by a pediment, and with a double arcade on either side. It does not correspond with the building which is pointed out to the visitor as the only remaining portion of the palace known to have been built and inhabited by the Ostrogoth king. There is most satisfactory proof of the palace having stood on the spot, but with what degree of truth the present building is asserted to be part of the original work it would now be very difficult to ascertain, but the supposition is very generally received, and there is

peculiar feature, and may be observed in other buildings of Italy. It may also be noticed as previously occurring in some structures of the age of Constantine, and may have been perhaps originally suggested by those deep recesses that contribute so much to the effect of the interior of the Roman Pantheon, a building in all ages regarded as an object of wonder and imitation.

The small columns set in a square rebate, worked at the angles of the coved recess and supporting a plain semicircular arch, may be seen in most of the earliest Norman buildings, as well as frequently on the Continent; and it is worthy of note that this particular application of a column, for which no authority can, it is supposed, be produced in any work of Classic art, may be observed at the Zizza, a palace of the Saracen emirs at Palermo, where the small shaft, so placed, is made to support an entablature carved with a rich frieze of Cufic characters. It is interesting, says Mr. Smirke, to observe the gradations from this simple insertion of a slender circular shaft in a square rebate, to all those complicated moulded jambs with which it delighted our ancestors to enrich their doorways and windows.

Other points of resemblance which this building presents.

to those of after times will be apparent on the most cursory inspection: the projecting piers on each extremity of the front may be considered in no other light than as buttresses, whilst the series of arches in relief against the face of the wall may be at once recognised as a great advance towards those ranges of simple or interlaced arches springing from small columns, which form perhaps the strongest characteristic of the subsequent architecture of Europe. As a favourite mode of exterior decoration, especially on the apses of churches, they may also be seen on many very early buildings. The specimens of what is usually styled Lombardic art have them almost invariably, and although the Lombards are probably as little deserving the honour of having originated a style of architecture in Italy as the Goths are of having done so in England, and that generally speaking the buildings attributed to them are the works of later artists, yet there can be at least as little doubt but that a great number of the buildings in the style alluded to, which are to be found in Italy, and which present, in their general appearance, a near approximation to the churches of the Normans, were erected long before those Northmen had left their ships, or thought of any pursuits but those of war and rapine. These diminutive arcades which occur over almost the whole of Europe sometimes appear interlaced; and it was to a comparatively late instance of them so arranged in Hampshire that it has been imagined that the true origin of the Pointed arch might be traced, an idea which can alone be attributed to the limited range to which researches into the history of architecture were formerly confined.

In seeking to cultivate our knowledge of this history, no period nor country ought to be indifferent to us. The Ravenna palace, it is true, is without any architectural charms to attract our regards, nor can any of the structures of the sixth century lay claim to a great share of pictorial merit; but they do not deserve the neglect and contempt with which they are too often passed over: they are interesting as holding a middle station between the buildings designed in the ancient Roman style and those which in England are termed Norman, and may be regarded as the timid and feeble efforts of art during its period of greatest depression and debasement.

LONDON IMPROVEMENTS.

A COMMITTEE of the London Owners' Association, of which Mr. J. Whittaker Ellis is chairman, and Mr. J. G. Metcalfe secretary, have issued the following important statement concerning the proposals of the London County Council, which will involve a new taxation of all rents and annual values in London.

The London County Council are promoting, in the present session of Parliament, amongst other bills, the following for the special taxation of owners of real property in London:—

1. The London Owners' Improvement Rate Bill, which proposes to levy a rate upon all owners of lands and tenements within the administrative county of London to an amount not exceeding 4d. in the pound. The rate is to be, in effect, an addition to the property tax to be paid by the leaseholder or occupier of the house, and to be deducted by each payer of rent *pro rata* only from every receiver of rent. Thus every receiver of rent will be charged 4d. in the pound in addition to the existing income tax. The proceeds of the rate are to be devoted to expenditure upon improvements, including future repayments of capital borrowed in the past as well as repayments of capital borrowed in the future. Unoccupied houses and buildings and vacant land are to be rated. No regard is to be paid to any existing or future contracts with respect to the payment of rates. Although this bill has, as a private bill, been ruled out of order by the Speaker of the House of Commons, notice has been given that it will be introduced into Parliament as a public bill.

2. The London Improvements Bill, which involves a total outlay estimated at 5,327,765*l.* upon the following works:—

New central street and subsidiary streets	...	...	3,869,550
Approach to Tower Bridge	...	...	436,000
Widening of Wood Lane, Hammersmith	...	...	47,215
Vauxhall Bridge...	...	...	484,000
Rotherhithe and Ratcliff Ferry	...	...	443,000
Widening approach (south side) to Woolwich Ferry...	...	...	3,000
Cost of sites for rehousing displaced persons...	...	...	45,000

Total : ... 5,327,765

By this bill, dealing with the above-mentioned improvements, it is proposed to levy "betterment" charges upon owners within areas adjoining each of these improvements, except the widening of Wood Lane, Hammersmith, in addition to the general improvement rate mentioned above. Lands within the defined limits in the neighbourhood of each improvement are to be liable to the "betterment" charge to an extent representing "one-half of the amount which in the opinion of the Council will be the enhanced value or benefit derived or to

be derived by the said lands from the improvements." The Council are to have power to assess the charge by means of a provisional award within seven years after the completion of the improvements. The provisional award is to be subject to an appeal to an arbitrator appointed by the Local Government Board, but no appeal to a court of law is to be allowed. The charge may be apportioned "between the freehold and any other estate or interest in the lands."

The proposals of the London Owners' Improvement Rate Bill are entirely unprecedented, but the principle underlying the bill has been decisively condemned by the Town Holdings Committee of the House of Commons. The Committee state, in their final report, presented in 1892, after examining the whole question of expenditure upon metropolitan improvements, that "no sufficient cause has been shown for interfering with existing contracts relating to the payment of rates, and the methods proposed to the Committee for altering such contracts would be unfair, and would inflict injury without any compensating benefit."

The "betterment" theory has been twice embodied in bills by the London County Council, and twice rejected by committees of the House of Commons.

The effect of the proposals of the London County Council would be to seriously diminish the existing check upon extravagant expenditure on the part of that body. At present members of the County Council are to some extent restrained by the knowledge that the cost of any increase in expenditure comes out of the pockets of their constituents, and their object evidently is to throw the greater part of the burden upon those who have no voice in electing the Council.

The London County Council seek to force their schemes upon the Legislature by refusing to carry out the necessary public improvements unless their proposed changes in the law of rating are sanctioned, to arrogate to themselves the prerogative of the Legislature by increasing the income tax on rents, and to stifle discussion and public opposition by introducing (as already stated) a bill affecting large public interests as a private bill.

The attempt to introduce sweeping changes into the general law of taxation by means of private bills is grossly unfair to the owners and occupiers affected. On the one hand, the London County Council, having the ratepayers' money at their disposal, are not deterred by any consideration of Parliamentary costs. A great deal of the ratepayers' money is wasted upon bills seeking rash alterations in the law. On the other hand, the expense of an opposition in Parliament is so great as to deter most of the private persons who have a *locus standi* from appearing by counsel.

It appears to be sufficiently obvious that, unless owners as a body take common action in the shape of a new organisation or committee for the express purpose of opposing these bills, the schemes of the London County Council may be passed; but that, on the other hand, if the case of landowners of every class is protected by an organisation with adequate funds and duly represented before any committee to which the bills may be referred, there is reason to hope that the bills may be defeated, or, at all events, rendered practically harmless.

TRADES UNIONS AND BUILDERS.

THE action taken by Mr. Joseph Temperton, builder and merchant of Hull, against the officers of three trades unions consisting of workmen engaged in the building trade, has been tried at Leeds before Mr. Justice Collins. The following report is taken from the *Leeds Mercury*.

Mr. J. W. Lawson and Mr. Montagu Lusk appeared for the plaintiff; the former explained the grounds of the action.

Mr. Joseph Temperton, the plaintiff, bore out the opening statement of his counsel. He used, he said, to make from 40*l.* to 50*l.* a month; but since August last he had only made 15*l.* or 16*l.* a month, with people not connected with trade societies.

In cross-examination by Mr. Robson, the plaintiff said he was a master builder, but had only joined the masters' association in October last.

Have there been some complaints among the men about jerry-building?

The Corporation of Hull looks so well after builders that there is no such thing.

Were you not aware that both masters and men were agreed about a rule which should stop jerry-building?

No. He had heard, the witness said, in answer to other questions, that the president, secretary and four other members of the masters' association had signed the men's rules. He did not, however, know that the fact had been advertised in the papers. He had not heard it said that the only way to prevent "scamping" and "sweating" was to make master builders do the work themselves, and forbid sub-contracting. He did not know that in 1892 there was a rule for masters and men directed against sweating.

A discussion here took place between counsel and his

lordship, which resulted in the judge stating that he was prepared to rule that to induce persons not to deal with a particular person was actionable.

The witness, cross-examined by Mr. Tindal Atkinson, said that he did not know he was offending against a rule.

By Mr. Walton: He never heard that Myers & Temperton sweated their men. On the contrary, the men refused to come out at the invitation of the boycotting committee.

Mr. J. C. Brentano, builder, Hull, said that some time last August he gave an order to the plaintiff to supply some cement to him of the value of about 40% or 50%. Only a portion of this was supplied, as he could not take the remainder, owing to a resolution which had been passed by the Bricklayers' Society. Witness attended a meeting of the joint committee of the trade societies, and stated that he had a contract with Mr. Joseph Temperton. Mr. Russell, one of the defendants, was present, and pointed out that the trades union had a dispute with the plaintiff, and a resolution was passed not to allow the union men to fix his goods. Witness argued that it was unfair to him, as his contract was made before the resolution was passed. He consented, however, to wait for a fortnight, knowing that if he did not his own workpeople would be withdrawn. Subsequently the union told him he must get his goods from some one else, and he did so."

The resolution referred to was at this point put in. It was in the following terms:—"Resolved that this committee advise the three societies to abstain from using any lime supplied by merchants who are supplying any builders who are working contrary to the joint working rule No. 9, and further, that they refrain from handling or fixing any artificial stonework made by any man who is working contrary to rule No. 9."

Mr. James William Gibson, also a builder at Hull, said that Russell had told him they intended to take "extreme measures" with regard to Mr. Temperton's goods. He refused to give up trading with the plaintiff, and his men came out on strike. He afterwards decided to break his contract with Mr. Temperton, and his men then came back to work.

Evidence to the same effect was given by Mr. John E. Woods, Mr. Charles Scott, Mr. J. Townsley, Mr. Edward Good and Mr. W. T. Robinson, builders, and Mr. J. G. Hearfield, lime merchant.

Mr. Joseph Ward, master slater, said he was fined 5% for a breach of the rules of the Operative Builders' Society in trading with the plaintiff, and the defendant Russell gave him a receipt.

In cross-examination, the witness acknowledged that the defendants said there had been expenses incurred in connection with the calling out of his men, and it was only fair if they excused the breach of the rules that he should pay the expenses.

Mr. John Myers, of the firm of Myers & Temperton, stated that after the action of the defendants they could not get any lime direct from the Hull lime merchants. They did get a few loads by other people ordering them.

Mr. Walton: Then you were running the blockade?—Yes.

This concluded the case for the plaintiff, and Mr. Robson, on behalf of his clients, submitted that the plaintiff had shown no case on any of his grounds of complaint. There was no evidence, he said, to show that the defendants had endeavoured to get the men who were subject to their influence to break any contract or service into which they had entered. The customary notice of an hour had been given.

His lordship: I did not understand that to be put forward.

Mr. Robson said that the next ground of complaint he understood to be that the defendants had procured various persons who were masters to break contracts for goods sold into which they had entered. He held that the workmen had a right to withhold their labour from any employment, and they need allege neither a reasonable cause nor a philanthropic motive for doing so. There was no evidence to show that the defendants had done anything of an unlawful nature; and if any injury had resulted from the action they had taken they could not be held responsible for it. The question of malice, he maintained, could not possibly be considered when once the motive of the parties was made clear to be legitimate and proper. If the men could not withhold their labour under circumstances such as had been described, he failed to see of what use the Trade Union Act was.

Mr. Atkinson submitted that on his clients' behalf there was still less ground for the case going to the jury. There was not a tittle of evidence to show that they knew anything whatever about the existence of the contracts referred to. Nor was there a tittle of evidence to show that Russell was acting as the agent of his clients in going round to these persons and using threats or making statements which either induced, or were intended to induce them to break their contracts with the plaintiff. Nor was there anything to fix the responsibility for the resolution on his clients.

His lordship pointed out, however, that from Mr. Brentano's evidence there was proof that the defendants knew of the existence of the contract.

Mr. Robson: A combination to boycott a person in the absence of coercion or violence had never been held to be actionable.

His lordship: It has in Ireland, I believe, been held that boycotting is a crime.

Mr. Robson: That refers to agrarian matters. I don't think it has been laid down by law.

Mr. Montagu Lush drew his lordship's attention to a case in Ireland, decided by Chief Baron Palles, the Queen v. Heaphy, in which damages for boycotting were upheld.

Mr. Lawson Walton mentioned also the case of two men in England who had been sentenced to three months' imprisonment for boycotting a cattle dealer.

After the counsel for the defence had finished their arguments,

Mr. Lawson Walton replied, and maintained that there was ample evidence that all the defendants, with these contracts under their observation, put into effect their resolution, notwithstanding that the contracts existed. It was clear there was a conspiracy in this case to cut off the whole of Mr. Temperton's trade.

His lordship decided that there was evidence to go to the jury against all the defendants, and the Court then adjourned.

On Wednesday Mr. Robson opened the case for the defence of his clients, Russell and Stephenson, who were attacked as trades unionists for a course of conduct which was not merely for the benefit of themselves, but for the trade generally. It appeared that for some time there had been complaints in Hull about jerry-building, which was rendered easy in that town by a system of sub-contracts. In cases where the master builders did the work themselves there was some guarantee that it would be well done. The letting off of the work in sub-contracts led to the introduction of the system of sweating. The workmen passed a rule on the subject which the master builders agreed with, and decided that they would not work for any employer who contravened it. In this case the defendants had simply endeavoured to enforce a beneficial trade rule by the exercise of their undoubted right to withhold their labour, and induce others to do likewise, from men who acted in opposition to the rule. Those who were called leaders in trades union matters were often quite as much followers as any of their party, and it was so in the present case. The defendants, though the leaders of the union in question, were forced on behind by the members of their union, who were enthusiastic and had been for years in their demand for the abolition of the system of jerry-building which was fostered by sub-contracting. He argued that nothing of the nature of an illegal act had been proved, and until that was shown the defendants were entitled to a verdict. The question of fines had simply been imported into the case with a view to prejudicing it and to bolster up a bad case. If the fines were illegal and improper, it was in some other court that the persons fined had their remedy. The case, Mr. Robson said in conclusion, was one of supreme importance, involving very grave public issues. There had been no more intent to injure the plaintiff than there was in every trade dispute. In every dispute one man gained his end at another's expense, and therefore in every case there was a certain amount of injury inflicted. Competition in trade inflicted injury one on another, but that was no ground for interfering with the course of trade. Neither was there any ground for interfering when persons were seeking to carry out a legal and proper trades union purpose.

Mr. Chitty, for the rest of the defendants, intimated that he should not call any witnesses, and would not therefore address the jury at that point.

The only witness for the defence was one of the defendants, Mr. John Russell, president of the Hull Operative Bricklayers' Society, who said that for some time there had been a discussion going on in Hull about jerry-building, and he had raised the question both in the Town Council, of which he was a member, and in the society. Rule No. 9 was agreed upon for the purpose of putting down the evil, and on June 1, 1892, it was signed by the president and several representatives of the Master Builders' Society. He then detailed the negotiations which had taken place between his society and the plaintiff with regard to breaches of that rule.

Cross-examined by Mr. Lawson Walton, the witness said that those men employed by Messrs Myers & Temperton who refused to come out on strike when told were afterwards fined and expelled the society.

You used the most drastic measures you could?—It was merely a question of reciprocity.

In answer to further questions, the witness said there were about a thousand men altogether in the societies in question, but he denied that their withdrawal would be enough to stop the trade of any man engaged in the building trade. In the action they took their object was to protest, by the withdrawal of their labour, against any man breaking their rule, and to make him conform to the rules of the society.

You tried to make him conform to the rules of the society?—Yes.

Do you now say that Mr. Joseph Temperton ever broke any rule of the society?—Certainly.

Did you say to one of the masters that you intended bringing Joseph Temperton to his knees?—No.

Mr. Robson having summed up his defence to the jury,

Mr. Chitty, on behalf of the other four defendants, said there was a distinction to be drawn between the defendants for whom Mr. Robson appeared and his clients. The resolutions complained of were passed by the Operative Bricklayers' Society, and his clients were in no way responsible for or affected by trade resolutions. The jury must, he urged, find that each of the defendants individually had implicated himself in any illegal proceedings which might have taken place before they could find for the plaintiff. The proceedings had, however, been quite within the rights of the defendants, and no cause of action had been proved.

Mr. Lawson Walton addressed the jury on behalf of the plaintiff, and agreed with the counsel for the defence that the case was one of enormous importance to both sides. It was of importance to traders because, if Mr. Robson's contention was true, no trader could continue to exercise in his trade, in the face of the opposition of a labour combination, that right which was part of the birthright of every citizen in this country. If Mr. Robson's view of the law was correct, those who embarked in trade did so subject to the control of these organisations of labour, which might be formed, not only in their own trade, but in all industries connected with it. It was an important case also to the defendants, for if their contention was correct, there would be no limit to the despotism in relation to trade dealings. He asked the jury to negative the argument of the defendants, that the plaintiff was there to complain of the exercise by certain persons of their right to sell their labour in whatever market they pleased. The truth was that the workmen, led by the defendants, had not merely refused to work for the plaintiff, but had also cut off all his business and the materials necessary for his trade, and this he contended was neither legal nor fair.

His lordship, in reviewing the whole case to the jury, put to them the following questions:—(1) Did the defendants or any of them maliciously induce Brentano, Gibson and Woods, or any of them, to break their contracts? (2) Did they or any two or more of them maliciously conspire to induce the persons named and others not to enter into contracts with the plaintiff, and were such persons thereby induced not to make such contracts? With regard to the question of malice, he said that if a person induced another to break a contract, of the existence of which he was aware, in order to hurt a person in his business, to hamper him or to put undue pressure upon him, the law considered the act a malicious one. To conspire was to act together with a view to bring about something either unlawful in itself or to bring about a lawful thing by unlawful means. If they concluded that these persons, with a view to injure the plaintiff, conspired for the common purpose of inducing as many people as they could control not to deal with him, with a view to injure him, that, in his judgment, would be a wrong, and if they were of opinion that they succeeded in their object so as to damage him, then it was an actionable wrong.

The jury, after suggesting to his lordship that they should receive more remuneration than that usually allowed, retired to consider their verdict. After an absence of half an hour they returned into court with an answer in the affirmative to each of the judge's questions, and awarding the plaintiff 250*l.* damages.

Mr. Lush applied for judgment for the amount given and for an injunction to restrain the defendants from endeavouring to induce anybody to break contracts with the plaintiff or to prevent persons entering into contracts with him.

His lordship: Yes, certainly.

Both Mr. Tindal Atkinson and Mr. Robson applied for stay of execution, the latter gentleman remarking that there was no doubt there would be an appeal.

His lordship granted stay of execution on the condition that the 250*l.* was paid into court, and that it should not apply to the injunction.

THE LANGUAGE OF ARCHITECTURE.

IN the concluding lecture of the Oxford Extension series on "Architecture as the language of the English people," delivered in Bath, Mr. C. R. Ashbee said that in studying the history of architecture they found the thoughts and ideas of each race expressed in stone as the most permanent of records, hence the expression—the language of architecture. It did not apply only to their own country, but to all countries, and equally everywhere. Architecture was the language of the arts and it, above all others, was the language of the country in which it appeared. In every country architecture developed and worked up to a climax. Though at the present day the language was inarticulate and confused owing to the amount there is to tell, it was none the less expressive. One might

almost say there were two kinds of people who build buildings. There was the architect proper and the jerry-builders, and certainly a vast portion of the work of the present day was that of the jerry-builder. There was some consolation in the thought that although the latter did express the language of the time it would not be a very lasting or loud one. It would all end and finish at the end of the 99 years' lease. But the works of the architect of the present day would be for future time, and its peculiarity was its eclecticism. By that he meant the picking and choosing out of many styles, and that was expressed both personally and nationally. The lesson that the study of architecture might teach them as individuals was better taste. If they got to see the connection between things thought and work produced in the past they might try and express their nobler thoughts in better production at the present day, and the highest form of production was architecture conceived, not as a domestic convenience, but as an art—the mother art. With respect to his remark that it might teach them as individuals better taste, he said they were one-sided in their education. They were very particular about their literature, they read a great deal and professed to think a great deal; they cultivated the intellectual side, but had done very little as yet for the other side, which was the side that made for beauty. Puritanism had probably made them the great nation they were against and beside their neighbours abroad. It had also made them encourage and develop the intellectual side, and it was this, the classicism which came at the time of the Renaissance together with Puritanism as the study of the people, upon which their modern education in great part was based. On the other hand, they lost sight of their development as human beings, lost sight of the study and the feeling of what was beautiful for what was noble in beauty as beauty, and that was what they were trying, what they had been trying for the last fifty years to get back again. If they could only make their education more harmonious, not only to read the books that were good, but to look upon the things that were good, they would be doing quite as much for their children as if they only taught them to read what was good in books. There was another side of their nature which had to be developed and trained, and it seemed that this course would fitly close if it enabled them, through the architecture of their own town, to get to understand that other side of life which was neglected and of which they could understand more than they did. Architecture had been the backbone upon which other arts had clung; where architecture was great there they would almost always find the other crafts were great too; that was the reason why it had been called the mother art. They were only beginning to see again that architecture really was the language of the English people, but only when they gave to it the place it had held in the past—the highest place—and regarded it as an art and not as a domestic convenience, would they fully understand that it did express the language and thoughts of the people. In conclusion Mr. Ashbee spoke of the problem of production, observing that the workman of the past produced a better piece of work because he was happier in his work than a man of the present time. If they took a piece of work now they found it had been produced by many hands and many machines; probably there had been a strike in the shop and the workmen had not taken that happiness or interest in their work. He did not want to compare the workman of the past with the one of the present, to say that the one was better or cleverer than the other; but what he wanted to say and leave with them was that the workman of the past was a happier man than the workman of the present day, and that was proved by the work left by him. Therefore the one important thing which the English people had to consider at the present day was how they could improve and ennoble their productions.

THE ELECTRIC LIGHTING OF EDINBURGH.

THE following report on the electric lighting of Edinburgh has been prepared by Professor Kennedy:—

In accordance with the request of the electric lighting committee of the Town Council, I have made an examination of the northern half of Edinburgh with a view to the electric lighting of that district, and have made an estimate of the probable cost of the work, the probable annual expenditure, and the probable annual income from the sale of electric energy. I have pleasure in now placing on record the results at which I have arrived.

I find that the total length of roadwork in the scheduled streets is about 12,000 yards. This includes the two sides of such streets as would be likely to require current on both sides, and the whole circuits of Moray Place, Ainslie Place, Randolph Crescent and Charlotte Square. I have also included Rothesay Crescent. Of the length given, about 1,300 yards represent road crossings and other unproductive work, leaving what may be called the "productive frontage" as about 10,700 yards. The completion of the distributing mains in all the important

residential and commercial streets between Heriot Row and Princes' Street, and also the residential streets and terraces in the west to Donaldson's Hospital, in the north across the Dean Bridge, and in the east round the Calton Hill, including with these several less important streets in which connecting mains would advisably be laid, would involve about 13,960 yards of additional roadwork, of which at least 3,000 yards would be unproductive. The total roadwork for the distributing mains would therefore be 25,960 yards, and the total productive frontage about 22,660 yards. In addition there would probably be about 2,500 yards of additional roadwork for feeders, so far as they are laid unavoidably in streets where there are no distributing mains.

Keeping in view the character of the different parts of the district to be supplied—with which several years' residence in Edinburgh has made me very familiar—I have estimated that if all the shops, hotels, clubs, &c., and all the large private houses (along the streets and roads included above) were to be supplied with light, they would use from 150,000 to 200,000 lamps of 8 c.p. or their equivalent. (The difference between these figures is affected chiefly by the use of light in the premises above the shops in thoroughfares like George Street.) I need not say that it will probably be a very long time before such a large demand for current as this exists. But I estimate that in three years or thereabouts after opening the station you will probably have to supply 40,000 lamps wired. There are, of course, special reasons which make it probable that the demand for electric light will grow very quickly in Edinburgh.

I find that in London the cost of an 8 c.p. lamp per annum in an hotel or club is about 20s., in a shop about 8s. 6d., in an office about 6s. 9d., and in a private house about 5s. (these figures are reckoned on the basis of a charge of 6d. per unit). Calculating on these rates and allowing for the different classes of property in the district, I estimate your total income from 40,000 lamps of 8 c.p. at 17,100*l.*, which is practically 8s. 6d. per lamp per annum on the average. I think this is a low figure, but it is as well that you should be on the safe side.

This estimated income corresponds to a sale of 342,000 units per annum, about half as much as was sold last year from the Davies Street station of the Westminster Electric Supply Corporation, which was visited lately by some members of the Edinburgh Town Council.

Including reserve plant, there would have to be placed in the station (assuming the whole district to be served from one station) about 1,400 indicated horse-power in engines, with the corresponding boilers and electrical plant. The probable maximum demand at the lamps would be equivalent to about 6,150 amperes at 100 volts.

For your information I may say that this corresponds to a station from 15 to 20 per cent. larger than that which I am just now starting in Glasgow. The cost of it would, however, be greater in a somewhat larger population, as the mains to be laid are much longer. It is doubtful, also, if the conditions would allow so cheap a system of mains to be used as that which I have employed in Glasgow, and it is improbable that a site can be had so central as the Waterloo Street site there.

I have made a preliminary estimate of the cost of such a station as I have mentioned, and of the whole system of mains and feeders necessary for the supply of the amount of electric energy which I have given above. From this estimate I conclude that this total capital cost may be about 85,000*l.* It is probable that more careful estimates may very considerably reduce this sum; but it would be as well at this stage to assume that it is not too large. The sum I have mentioned includes buildings and chimney, plant of every description, the mains all complete, and all roadwork (in connection with this matter I have been greatly helped by a very careful detailed estimate of cost of roadwork in the scheduled streets which Mr. Cooper has been kind enough to prepare for me), and reinstatement of roads and paving. It does not include land, nor connections to customers' houses, nor meters (for these latter a rent is paid by consumers in the case of all existing electric stations).

The price I have mentioned includes a sum of 6,710*l.*, representing the additional cost of an arc lighting plant for 110 arc lamps (with duplicate machinery and an extra boiler), such as has been put up in Glasgow. This plant would be sufficient to light well the principal streets of the northern part of the city.

In my estimate I have assumed it to be essential that the system of supply should be one in which the consumers are connected directly to a low-tension network of distributing mains. The total sum I have given will be sufficient whether the network is supplied directly by low-tension feeders (220 volts) or by high-tension feeders (say 2,500 volts), with banked transformers, or on a modification of the "Oxford" system. So far as I have been able to work out the matter, there will not in your case be very much difference between the different systems in cost. But this and the other points which really determine the choice of system can only be settled after a detailed investigation.

As to cost of production, I find it possible to form an

opinion with very little difficulty. The total cost to you in salaries, wages, fuel, stores, renewals and maintenance—by the time when you are selling 300,000 units per annum (including wages and materials in maintenance of mains and all other distribution expenses)—should not be more than 2*5d.* per unit sold. Establishment charges and general office expenses should not be more than 0*5d.* per unit, making the total outgoings on works 3*d.* per unit. To this has to be added the cost of interest and sinking fund on your capital, which I do not work out, as I do not know the exact rate at which you obtain loans. If the sum borrowed were 100,000*l.*, and the total interest, &c., 3 per cent., it would amount to 2*4d.* per unit on 300,000 units per annum.

It would be possible for you to charge at the rate of 7*d.* per unit at first, and 6*d.* per unit after you had got into regular work with a paying output. So far as my opinion is concerned, however, I should certainly advise you, if you take up the work yourselves, to start boldly at 6*d.* per unit, with the object of increasing your output as rapidly as possible. You will notice that a very large part of the total cost I have given—the whole of the interest and fully half the other expenses—is really a fixed charge, and will certainly not increase until the plant has to be increased; that is, until you are selling at least 450,000 units per annum. The cost per unit therefore falls off very rapidly indeed as the total number of units becomes larger.

I may also say that the cost of doubling the capacity of your plant and feeders (the distributing mains must be made large enough to start with) will not exceed 30,000*l.*, so that the cost per unit will decrease in a geometrical ratio as the station grows.

I have left out of consideration the cost of arc lighting on both sides of the account. I assume that the current for this purpose would practically be sold at cost price. As to the time at which you can hope to make the undertaking pay, if you do the work yourselves I think you can hardly hope that you will be able to do without a loss in the first year of working. You will no doubt pay all your actual expenses apart from interest on borrowed money; but I think it would be too sanguine to hope that you would do much more. During the second year of actual working, however, if the scheme is a well-thought-out one, and thoroughly well managed, and if the financial arrangements are carefully made, I think you ought practically to clear all your expenses, including interest on capital, &c.

I need hardly point out that to attain this result—which, I feel sure, can be attained—it will be necessary, not only that the system should be well schemed and managed, but that it should be energetically pushed by the staff of the department which you put in charge of it. I feel no doubt, as I have already said personally, that electricity supply in Edinburgh should prove exceedingly profitable, owing to various local conditions (among which the price of gas cannot be forgotten), if it is thoroughly well managed.

In making these remarks I hope it will be understood that I am not expressing any opinion as to the comparative advisability of the Town Council taking up the matter for themselves or passing on their responsibilities to a company. The notes I have given are merely such as may serve, as far as they go, as part of the data on which this question will be decided. I will only urge one point very strongly, that if it be decided to hand the work over to a company it should be an absolute condition that the company should be simply a *bona fide* local supply company, entirely and altogether free from any connection whatever with any contractors, even those of the highest repute.

YORKSHIRE ARCHÆOLOGICAL SOCIETY.

A COMPANY has registered under the title of the Yorkshire Archæological Society, every member agreeing to contribute to the assets in case of liquidation a sum not exceeding 10*s.* to take over the property, effects and liabilities of the present unincorporated association known as the Yorkshire Archæological and Topographical Association, for the examination, preservation, and illustration of the history, architecture, antiquities, manners, customs, arts and traditions of the county of York, and especially the collection and preservation of books, pamphlets, manuscripts, deeds, engravings, drawings, coins, antiquities and other objects relating to or bearing upon the history, antiquities or topography of the county. The subscribers are:—G. W. Tomlinson, J.P., F.S.A., Queen's Road, Edgerton, Huddersfield, engineer; S. J. Chadwick, F.S.A., Dewsbury, solicitor; H. Lowther Clarke, M.A., The Vicarage, Dewsbury, vicar of Dewsbury and canon of Wakefield; T. L. Chadwick, M.A., Dewsbury, registrar of County Court; E. Wilson, Leeds, solicitor; H. S. Childe, Wakefield, mining engineer; J. W. Walton, Wakefield, surgeon. The affairs of the society are to be governed by a council consisting of a president, vice-president, honorary secretaries, and twenty-four ordinary members. The first president is T. Brook, F.S.A., and the first treasurer is to be H. S. Childe. Licensed by the Board of Trade.

ARCHITECTS' COMMISSIONS, BIRMINGHAM.

THE following letter from "One of the Craft" appears in the *Birmingham Daily Gazette*, and relates to distribution of commissions by the local Corporation, a subject to which we have referred before now:—

The New Technical Schools Committee are to be congratulated upon the admirable way in which they are carrying out their work in endeavouring to break down the "huge monopoly" which has existed for so long a time in the school architecture of the city. Theirs is the first building of any magnitude that has been submitted to a number of the principal architects of the city in competition.

May I whilst on the subject call your attention to the new Infectious Hospital, which, I believe, is to cost nearly 30,000*l.*? Why is this placed in the hands of the firm it is? For what reason? I was under the impression that a resolution was passed by the Council that all works exceeding 10,000*l.* should be publicly competed for, and not be given to any particular firm. Can I ask why this has not been done in this particular case?

There is also the extension to the Rubery Hill Asylum, which is estimated to cost about 25,000*l.* For what reason is this put direct into the hands of one particular firm of architects? I suppose the same analogy will apply to this as to the others, viz. that the original portion of the building was carried out by the same architects, and this matter should be placed in their hands also.

I ask where this is going to end if carried out without a limit? What opportunities will there be for the younger members of the profession to get a share of the public works of the city? I maintain, sir, it is a crying shame that there should be such a "huge monopoly" of the public works.

I would also remind the Architectural Association that they have bound themselves and formed a precedent behind which committees shield themselves. Some time back they met and passed a resolution to the effect that they thought it would be desirable to let the architect for the New Law Courts in Corporation Street carry out the new police offices at the corner of Newton Street and Corporation Street. The Association having laid down this rule, it forms a defence and a precedent for committees to act on, and will apply with equal force to other public buildings as at Rubery Hill Asylum in the new extensions. And does the same apply to the Infectious Hospital? If not, why this continued patronage to one particular firm?

If this is so, would it not be as well for the Architectural Association to rescind their resolution at once, and so clear this matter up and get justice done to the profession generally?



The Qualifications of Fellows of the Royal Institute of British Architects.

SIR,—The attention of members of the Institute is drawn to the important question to be decided at the special general meeting of the 27th inst., on the desirability of the examination of candidates for fellowship. The following *Regulation*, unanimously adopted by the Council, will be submitted to the meeting for their adoption:—

On and after November 1, 1893, every person desiring to be admitted a Fellow shall in all cases submit for examination, by and to the satisfaction of the Council, evidence of his abilities as a practising architect—such evidence to comprise working drawings and, if possible, photographs of his executed works—accompanied by a declaration signed by him that the buildings of which he has submitted drawings and photographs have been designed by himself; and such further evidence, if any, as the Council may under the circumstances of the case require.

In addition to this *Regulation* the general meeting will be asked to decide whether the time has now arrived for the Institute to make the following *Declaration*:—

Declaration of the Royal Institute under its Charter.

On and after January 1, 1896, subject to the power reserved to the Council in section 3 of the Charter, every person desiring to be admitted a Fellow shall be required to have passed such examination or examinations as may from time to time be directed by the Royal Institute.

We, the undersigned, are firmly persuaded that such a *Declaration* is undesirable in the interests of architecture and of the Institute, and is wholly unnecessary. And further, that the *Regulation* above quoted is amply sufficient to fulfil all the provisions of section 3 of the Charter, and we believe will tend

to secure a high standard of proficiency in the class of Fellows. We hope that all members who agree with these views will make it convenient to be present at the Institute on the 27th inst.—Yours faithfully,

(Signed)

JAMES BROOKS.

HENRY CURREY.

CAMPBELL DOUGLAS.

JOHN L. PEARSON, R.A.

Sir ARTHUR BLOMFIELD,
A.R.A.

JOHN BELCHER.

E. INGRESS BELL.

JOHN M. BRYDON.

WILLIAM D. CARÖE.

R. HERBERT CARPENTER.

THOMAS E. COLLCUTT.

HERBERT O. CRESSWELL.

HENRY L. FLORENCE.

ERNEST GEORGE.

J. ALFRED GOTCH.

ALEXANDER GRAHAM.

WILLIAM W. GWYTHYER.

B. INGELOW.

ROBERT KERR.

EDWARD W. MOUNTFORD.

LEONARD A. STOKES.

ASTON WEBB.

WILLIAM YOUNG.

GENERAL.

A Memorial Chapel to the late Hon. Christopher P. Bouverie is about to be erected at the St. Martin's House of Mercy, Salisbury, to which he was for many years hon. secretary. The chapel, which is to accommodate about ninety persons, will be erected from the designs of Mr. G. Hamilton-Gordon, of the firm of Taylor & Gordon.

The Plans prepared in 1885 for the improvement of Holy Trinity Church, Guildford, by Sir A. W. Blomfield, are to be carried out at an outlay of about 5,000*l.*, that is, 2,100*l.* for work in the interior and 2,800*l.* for the tower.

M. Charles Meissonnier has decided to present eleven studies by his father to the French Government out of the collection now being exhibited in Paris.

The Painters who are to take part in the second competition for the decoration of the *salle à manger* of the Hotel de Ville, Paris, are MM. Bertrand, Lalou and Prouvé.

M. Cabat, the French landscape-painter, has died in Paris in his eighty-first year. He began to exhibit in the Salon in 1833. He was appointed director of the French School in Rome in 1878. By his death a chair becomes vacant in the Institut.

Mr. John Pettie's will has been proved by the executors, Mr. James Hardie and Mr. C. E. Johnson. The gross value of the personal estate and effects of the late Academician amounts to 11,688*l.*, and the net value to 10,497*l.*

The Exhibition to be held at Antwerp next year will be classified in 58 groups, comprising fine arts, education, liberal arts, industrial art, mineralogy, engineering, electricity, the textile industry, building, chemistry, shipping, commerce, &c.

The New Hall, measuring 150 feet by 80 feet, in connection with the Glasgow Athenæum is nearly completed. The works will cost about 30,000*l.*, and have been carried out from the designs of Messrs. John Burnet, Son & Campbell.

The Paris Municipality have decided to borrow 116,000,000 francs for works in connection with the water supply and drainage of the city.

Mr. C. H. Beloe has received instructions from the Chester Corporation to report upon a source for a water supply for the city, as the existing supply is unsatisfactory.

Mr. G. F. Watts, R.A., on Tuesday laid the foundation-stone of a lecture-hall and library, which Mr. J. Passmore Edwards is adding to the South London Fine Art Gallery, Peckham Road.

The Memorial-Stones of the new infirmary at Halifax are to be laid on June 17, when the local authorities will attend.

Mr. George Williams, on Saturday, the 18th inst., laid the foundation-stone of new Sunday schools, John Street, Bedford Row, W.C., which are being erected from the designs of Mr. F. T. W. Goldsmith, A.R.I.B.A.

M. Maillard has discovered in the course of operations on his property at Courbilhac the skeletons of several warriors that were evidently buried with care. Their metal belts and lances are so well preserved it will be possible by their aid to decide on the period when the men were buried.

Ten Associates of the Scottish Academy will be elected on Wednesday next. There are forty-seven candidates.

Mr. Alfred M. Fowler has been commissioned to prepare preliminary reports and plans for the main drainage of Brighouse and Rastrick, Yorkshire, which has become necessary in consequence of the pollution of the Aire and Calder.

Professor Schmidt has prepared a design for a new Protestant church, which will be the third in Munich.

An Association of Architects has been formed in Wellington, New Zealand, which is expected to develop into a society for the whole of the islands.

The Architect.

THE WEEK.

It is hard that those who have carried out a most difficult restoration should be called on to make sacrifices, yet that is the fate of Mr. J. O. SCOTT and Mr. THOMPSON, who have had to forego part of their claims on the committee of St. Michael's, Coventry. The debts, however, are not cleared off. A sum of 38,344*l.* was obtained through subscriptions, legacies and a mortgage on the church estate, but it was insufficient. Some of the inhabitants entered into a guarantee with the London and Midland Bank, and as that institution cannot be treated like the architect and contractor, they have become anxious about their position, more especially as their number has been reduced and they are jointly and severally responsible. All the committee can do is to implore the donors to the restoration fund to subscribe 5 per cent. on their original contributions. It has been also decided to make another effort to collect the amount of the promised subscriptions which remain unpaid.

As Ireland is at present, there is not much use in appealing for funds, however urgent and remote from politics may be the object. Owing to the state of public affairs, the committee of the proposed National Hospital for Consumption are compelled to postpone the contemplated start with the building works, as there is no likelihood of obtaining the support that would be requisite before entering into a contract for so expensive an undertaking. It is also worth noting that subscriptions amounting to 9,571*l.* have been paid, and it is therefore evident that many people feel that the hospital is a necessity. Lord FITZWILLIAM has, moreover, presented a most suitable site in the county Wicklow, and which has an area of about nineteen acres. The plans which were prepared by Messrs. T. N. DEANE & SON are also approved, and all that is needed is money, which unhappily is not likely to be provided while the country is in an agitated and apprehensive condition.

An exhaustive essay on the history of sculpture in wax was read at the meeting of the Académie des Beaux-Arts, on last Friday, by M. GASTON LE BRETON, the director of the Musée de Rouen. One point which excites much interest at the present time in France was brought out clearly. M. LE BRETON was able to show, on the evidence of a record discovered by M. MASPERO, that as far back as the reign of RAMESES III. lovers of the black art used to make wax figures of the men and women they were eager to overcome, and recite incantations over them. His Majesty was not exempted from being made a subject, but whether he suffered from the powers of darkness is not revealed by any painting or sculpture. It is fortunate for us in England that we are indifferent to portrait models in all forms, for if some French connoisseurs are to be credited, it is easier now than at any previous time by the aid of a figure in wax (that need not necessarily be a work of high art) and a little gibberish to employ spells and wreak such vengeance as the witch in "Macbeth" contemplated.

ON Easter Monday the preparations for the removal of MEISSONIER'S works to London for exhibition will commence. It is to be hoped that not only the pictures and studies which the artist possessed but a large proportion of those which were lent for the exhibition in Paris will accompany them. In London there is little doubt the exhibition of MEISSONIER'S works will excite almost as much interest as in Paris. It is understood that all the money received for admission to the exhibition, which will close in a few days, will be handed over to the charities which the artist aided, for M. CHARLES MEISSONIER has decided to defray the expenses.

MASON COLLEGE, in Birmingham, it is supposed was founded to advance technical education, and especially those branches which have most interest for local manu-

facturers. Whether the scope of instruction has been widened and the expenses increased in proportion, or the funds available are insufficient, there can be no doubt that the college is not what it ought to be. The Principal says that a great deal remains to be done in some technical departments, particularly in engineering and electrical engineering, before in equipment the college can be compared with others of similar standing. A large manufacturing centre like Birmingham ought not to be so limited in respect of facilities for the higher technical and professional training. Hitherto, expenditure on equipment does not exceed a mere fraction of what has been spent in many English towns for the like purpose. The most pressing need in the engineering department is a large testing machine. The purchase of such a machine has been under the consideration of the Council many times, but they have not seen their way to expend so much money as would be required. The delay is undoubtedly hindering the growth of the department. Another technical department of great industrial importance is languishing for want of money. There are this year only two students in the electro-technical department, and of these one is merely repeating the course he took last year; so that there is only one new entry. This seems very strong evidence that the work is not on right lines, and that it ought to be placed in the charge of a specialist with adequate equipment. At present the college cannot even compete with the technical schools. The truth really is that the Birmingham Corporation have to struggle in earnest for the existence of trade which was imperilled by the worthlessness of the State system of instruction in art and science. The technical schools have therefore secured the standing which the Mason College might have held under other conditions. Students prefer the schools to the college on account of the cheapness and efficiency of the instruction. Mason College may become a useful place for training school-mistresses, or it may even be transformed into a sort of medical school; but whatever may be its fate, it appears to be drifting away from the founder's idea.

WE have recently seen a very beautiful series of platinum prints of ten of the principal historical buildings in England. They are executed by Mr. F. W. EDWARDS, the well-known architectural photographer, and are published by Messrs. MARION & Co., of 22 and 23 Soho Square, London, W. The plates are mounted on heavy plate-marked India tint mounts, forming a picture 32 inches by 26 inches, and are issued at the remarkably low price of a guinea. The process by which they are produced is absolutely unchangeable, so that the print remains permanent for all time. They are produced in a delicate sepia tone, which gives a fine effect to the ancient masonry. We have not seen an engraving or etching which, for beauty of effect or truthfulness of rendering, will surpass these platinotypes.

A SECOND edition has been brought out of the lecture on "The Theory of Storiation in Applied Art" which Mr. HUGH STANNUS delivered at the Society of Arts in January. It relates to "that section of the rules of applied art which governs the selection and representation of meaning in the decoration of objects." An immense amount of material has been subjected to examination, and the lecture will not only impart new interest to the study of decoration, but will also aid students in the acquisition of a rational system of setting out their ideas. Mr. STANNUS has not spared labour in elaborating his theory, and in the present form his lecture will, we trust, be found useful to many artists, students and amateurs.

WE have already noticed the useful, if tiny, "Pocket Glossary of Technical Terms," published by Messrs. CROSBY LOCKWOOD & SON. A second edition has appeared, which comprises additional tables and other information. A book that can be carried in a vest pocket is no slight advantage for all who have to employ French technical works or to convert French weights and measures into their English equivalents.

THE STEAM-ENGINE.*

IT is not necessary to discuss the advantages of the steam-engine at length. In 1819, when it might be said to have scarcely emerged from its cradle, FRANCIS JEFFREY was able to say, "It was our improved steam-engine that fought the battles of Europe, and exalted and sustained, through the late tremendous contest, the political greatness of our land. It is the same great power which now enables us to pay the interest of our debt, and to maintain the arduous struggle in which we are still engaged, with the skill and capital of countries less oppressed with taxation." It was natural at the time that the influence of the steam-engine as a sort of indirect but invisible sinew of war should be foremost in men's minds, but JEFFREY could also recognise some of its other advantages. So he said, "It has armed the feeble hand of man with a power to which no limits can be assigned; completed the dominion of mind over the most refractory qualities of matter, and laid a sure foundation for all those future miracles of mechanical power which are to aid and reward the labour of after generations. The blessing is not only universal but unbounded; and the fabled inventors of the plough and the loom, who were deified by the erring gratitude of their rude contemporaries, conferred less important benefits on mankind than the inventor of our present steam-engine." There is little doubt that what seemed only visionary to JEFFREY (and it may be to his friend JAMES WATT) has been more than realised. The steam-engine is now a very direct agent in war, for it brings combatants together with an expedition that has created a new system of strategy. As regards industry, every year the number of callings which can afford to dispense with the aid of steam power is diminishing in England. Building, which was believed to be as dependent on handicrafts as in the primitive days, has ceased to be peculiar. Thanks to the inventiveness of TANGYES, ROBEY, RANSOME, HICKS, MATHERS, BAILEY, CRAVEN and others, engines are obtainable which, if moderate in price and of limited dimensions, are efficient, and can be turned to a variety of uses. Steam-pumps remove many of the difficulties which surrounded work in foundations. Steam-cranes and gantries have enabled work to be executed with expedition in positions that are lofty. In the quarry the steam engine has become necessary, and it enables stone to be cut not only into blocks but into veneers. The brick-maker has his steam-power brick-press, clay-grinders, &c. Timber is sawn, planed, surfaced, moulded and adapted to a variety of uses by means of power that is derived from steam-engines; metals have also succumbed to steam, and have become as convertible as wood. If in modern buildings it became necessary to prohibit the use of materials and articles which in any way were affected by the employment of steam-power, the order could not be accomplished unless at a cost that would amaze people.

The steam-engine was sufficiently efficient in WATT's time to justify his partner when he told GEORGE III. that they sold what kings were fond of—that is, power—at the Soho Works. An engine that was "stupendous alike for its force and its flexibility, for the prodigious power which it could exert, and the ease, precision and ductility with which that power could be varied, distributed and applied," might be supposed to be as perfect as was needed. At the close of the eighteenth century General BENTHAM was able to devise wood-working machines which, with no other motive power than was given by one of WATT's primitive engines, was able to be used for planing, rebating, mortising, the production of winding and curved surfaces, and even a sash window was turned out. Since that time many hundreds of improvements have been effected in the steam-engine, yet no expert would say that it is perfect. Judging by the past we assume that a century hence patents will still continue to be taken out by engineers for "improvements in steam-engines," and there will still be opportunities remaining to tax the ingenuity of inventive men. What is of more importance is that every improvement in the engine inspires improvements in the machinery which it sets in motion.

* *The Steam-Engine: A Treatise on Steam-Engines and Boilers.* By Daniel Kinnear Clark, M.Inst.C.E., M.I.M.E. In Two Volumes. Blackie & Son, Limited.

The large work which Mr. D. K. CLARK has prepared exhibits the efforts made in our own time to increase the efficiency of that machine which WATT claimed to have improved rather than invented. It cannot be called historical, and that is one of its most satisfactory characteristics. People who are of an archaeological turn can find interest in the old engines which are in museums, but a practical man would not think of setting about the improvement of any but the very latest class. He has to start with present times and present objects, and to leave the past and its engines to take care of themselves. Unless he is up to date like the newspapers an inventor has not much chance of being useful to his generation, and men of this class do not look to posterity for compensation for the indifference of contemporaries. For inventors and all who desire to be acquainted with the most advanced types of steam-engines there is no work that is comparable with Mr. D. K. CLARK'S. That he spares no pains to be exact is known to everybody who is acquainted with his writings, which have all gained acceptance as authoritative; but we doubt if Mr. CLARK had previously undertaken so exhaustive an investigation as was necessary before his two massive volumes could be produced. It was not sufficient to describe an immense number of British and foreign inventions which in some way were connected with his subject; Mr. CLARK had to systematise them and to explain their relation to one another. To a man who was not skilled in composition and resolute in keeping a fixed object in view a similar venture would end surely in chaos.

As the object of improvements is to increase to the utmost the amount of power that is to be derived from fuel, Mr. D. K. CLARK properly begins with a consideration of heat and water, which become in their combined form the life of an engine. He gives an account of experiments on all known fuels that might be employed, and, as in treating other subjects, summarises, as far as possible, the results in tables. Petroleum oils are found to afford the largest amount of heat, 1 lb. giving a total heat of 27,531 units, while average coal gives 14,700. Coal has, of course, compensating advantages, and many pages are assigned to the experiments upon it, for it is never likely to be superseded as long as steam-engines are employed. But, with coal especially, the problem becomes how to insure, as CARLYLE expresses it, "a purifying fire, wherein all poison is burnt up, and of sour smoke itself there is made bright, blessed flame." All that has been attempted for the prevention of smoke from the domestic fireplace is insignificant if compared with the efforts to rescue furnaces of steam-boilers from it. Mr. CLARK has tried to get over the difficulty, but when he superintended the series of official tests in connection with the Smoke Abatement Exhibition he did full justice to every effort.

The trials of furnaces and boilers are next discussed. From them formulæ have been deduced for proportions of heating surface, grate area, &c., of the various sorts of boilers of stationary, locomotive and marine engines. Then an account is given of the latest inventions for mechanical stoking, and from the experiments it becomes evident that with some of them there is a larger evaporation of feed-water than with hand-firing. In his chapter on factory chimneys, Mr. CLARK is no less precise. The necessity of adequate height is suggested by the remark of an American observer, who found that "in a still atmosphere the column of hot gases may rise unbroken to a level considerably higher than the top of the chimney, and that inasmuch the force of the draught may be augmented." A couple of extracts from Mr. CLARK's chapter will suggest that if there be empiricism about the proportions of factory chimneys, it is of a kind that can be made to assume a correspondence with theoretical form:—

Factory chimneys in Lancashire are made with liberal proportions. For the service of a range of six Lancashire boilers, 7 feet in diameter and 30 feet long, having each of them 33 square feet of fire-grate, Mr. Daniel Adamson provides a round chimney 150 feet high, 11 feet in diameter at the base and 6½ feet at the top. The total area of fire-grate is (33 × 6 =) 198 square feet, and that of the chimney-top is 33.18 square feet, of which there are 24.1 square inches per square foot of grate. The quantity of coal consumed, at the rate of, say, 17 pounds per square foot of grate per hour, is (17 × 198 =) 3,366 pounds per hour; and for the consumption of this there is a provision of 1.43 square inches of top-area of chimney per pound of fuel. Assuming the temperature 600 deg. F. for the escaping gases, the upward velocity at the top of the chimney would be 100 feet per second.

The volume of gases discharged is 570 cubic feet per second, for which a chimney area of $(570 \div 100 =) 5.70$ square feet would be required, being at the rate of .24 square inch per pound of coal consumed per hour. This calculated area is only one-sixth of the area actually allowed.

According to Lancashire practice, a chimney 60 feet high and 4 feet square at the top may be built for the service of six boilers, each evaporating 50 cubic feet of water per hour. Allowing 8 pounds of coal per cubic foot of water evaporated, 400 pounds of coal would be consumed per hour for each boiler, or 2,400 pounds per hour for six boilers. The top area of the chimney is $(4 \times 4 =) 16$ square feet or 2,304 square inches, or at the rate of $(2,304 \div 2,400 \text{ lbs.} =)$ say, .96 square inch per pound of coal consumed per hour. Allowing 35 square feet of fire-grate per boiler, there is a total grate-area of $(35 \times 6 =) 210$ square feet, for which the top area of chimney is at the rate of 11.45 square inches per square foot, and the coal is burned off at the rate of 11.5 pounds per square foot of grate per hour.

For a single boiler of the same dimensions and performance, a chimney 60 feet high, 2 feet square at the top, may be built. Here there is a top area of 4 square feet or 576 square inches, at the rate of 16.5 square inches per square foot of fire-grate. Coal is consumed at the rate of 11.5 pounds per square foot of grate per hour and 1.44 square inches of top area of chimney per pound of coal per hour is provided.

For an engine of 50 nominal horse-power consuming, say, 800 pounds of coal per hour, a chimney 60 feet high and 4 feet in diameter at the top may be built. At the rate of 15 pounds of coal per square foot of grate, the area of fire-grate is $(800 \div 15 =)$, say, 54 square feet. The chimney area is at the rate of 33.5 square inches per square foot of grate and 2.01 square inches per pound of coal.

Mr. Box mentions a chimney at Dartford which works well. It is a round chimney 80 feet high and 2 feet 9 inches in diameter at the top. It burns off 10 cwt. of coal per hour, for which the area is equivalent to .76 square inch per pound of fuel per hour.

In his second section the author treats of "the principles and performance of steam-engines," that is, regarding them under general aspects. Then follow chapters on details such as boilers, slide-valves, gearing, governors, &c. The different classes of engines are described in succession, such as stationary engines for general purposes, for large mills, pumping-engines, special engines, portable engines, multiple-compound or multiple-expansion engines, railway locomotives, compound locomotives, tramway locomotives, marine engines, &c. The illustrations are numerous, exceeding a thousand altogether, and are reduced from excellent mechanical drawings.

The publishers evidently prefer to invest in works that will have enduring interest, and Mr. D. K. CLARK'S "Steam-Engine" is the most important of those which treat of practical subjects. It is creditable to the firm to bring out such costly volumes, which, however, are offered at a price that is most moderate considering the quality of the information that is found in the pages.

MR. HERKOMER'S AUTOBIOGRAPHY.

ON Tuesday Mr. Hubert Herkomer, R.A., delivered his address as president of the Birmingham Royal Society of Artists. According to the *Birmingham Daily Post*, he said that in looking back he clearly saw that his artistic development had hardly a steady basis. The want of a strong, yet judicious, hand to direct him, that could have seen the drift and the identity in the embryonic state of his work was plainly visible. He did know himself now, but it had taken him twenty years to learn to do so. Very early his heart longed for the master's hand, and thus it was that he vowed that when the time came and he succeeded he would extend his practical hand to those who needed it, and save them from the many pitfalls he had encountered. He was saved by a "craze," but it was a wholesome craze. It was the "Walker craze." Curiously enough, before this craze settled upon him his longings hung in the balance between Walker and John Pettie. This splendid painter, whose loss the art world could not deplore too deeply, was at that time quite a "force" among young painters, though at that time he did not know it. He traced Pettie's influence upon him to a picture called *The Arrest of a Witch*. It was so brilliantly and vigorously treated and the open daylight in the picture so enchanted him, that, standing in front of it in the Academy, he well remembered remarking to his father, "I wish I could paint an oil picture to look like that." But by a strange process of natural gravitation he dropped bodily on to Walker. The Walker craze became a factor, a faith, a director to him. It became the all-powerful sight and seeing. But the seeing was long held back by wrong sight, for he took the outside qualities so often for the inner drift and meaning. He did not really understand the school until he came into close contact with Mr. J. W. North, who was undoubtedly the creator of the "germ" of that particular style which we call the Walker school. They might be surprised to hear that this did not

happen to him until the spring of last year. The result had been to bring back all the fervour of his early youth for a certain direction, and that without loss of intensity. But he was steadier and more wary, as a veteran who had gone through many dangers should be. That this early love should have sprung up so strongly in him as soon as he came in contact with the spirit that first gave it life was the more remarkable as he had in the intermediate time passed through a strongly-marked phase in his oil-colour portrait-painting which had never been touched by his leaning to the Walker school. Even now, when it was a question of an oil portrait, he was a distinct person, influenced by nothing but the personality of his sitter. But for that blessed power which had been left him to divide himself, as it were, into two individualities, he could not be sufficiently thankful. It widened his life immeasurably; it broadened his sympathies. It lessened the pain of failure; it increased the joy of success. It deepened the meaning of nature to him, and it kept alive the sensitiveness to fresh impressions without any risk to the fidelity of the heart. He could not determine now whether the "form" of his first work was likely to lead him to the best art he was capable of in after years. But he did know that it was a safer school to follow than the most modern of schools, which sought to startle by mere manipulation, which threw drawing to the winds and sentiment and modesty to the dogs. The whole school, however, to which he belonged emerged from the ranks of wood-draftsmen, and one and all suffered from some of the penalties which that peculiar work inflicts upon the man whose ultimate desire it is to become a painter. Drawing remains the all-essential element at first, and colour is but nominal. Overdrawing always destroys the charm of colour. Men like Turner have loosened up in their drawing as they have approached the golden period of their colour age. Walker, when he came into close contact with North, brought his ripened colour-faculty to bear upon his drawing with singular felicity, seldom approached by any other painter except Millais in our times. But in these early works of his (Mr. Herkomer's) subject was always a first consideration—aye, and never without a touch of sentiment either—then composition and drawing. There would be found in them an earnestness which he was not a little proud of pointing out. And if that earnestness sometimes overlooked what we now termed beauty, there was never to be found an inane figure, or a galvanised figure, or the slightest tendency towards instantaneous photography. One did not go about in those days with a hand camera. The demon was not yet abroad. The flattened-out figures, all grey and silhouette, were views of nature unknown to one, because the mechanical device of showing this form of drawing had not been invented, and no living man could have seen nature in that way without it. He desired to say one thing else in gratitude. Whatever faults were to be found in those early works, they were in type, in sentiment, and manipulation thoroughly English. Yet he was not an Englishman by blood, which made it all the more singular. And although he broke from English ground afterwards, and painted so much in his native Alps, he was only thoroughly happy in an English subject—indeed, a more thoroughly English subject had probably not been painted during the century than the *Chelsea Pensioners*. Although he understood the Alpine peasant to the core—could talk with him in his own dialect—the view he painted of his life could not be found in any of the Continental pictures by German painters, born and bred. Why was that? Because he had learnt, through the "Walker craze," to believe that sentiment and pathos belong to the peasant, and he was determined to carry out this doctrine in his native mountains. But all this, continued the President, has changed. We go to Paris now. The "over-appreciativeness," as Hardy calls it, of this age causes small things to be magnified. We wonder at insignificant things just now. Anything that makes us "sit up" is magnificent. Anything that frightens us must be wonderful. Anything that makes us laugh must be full of wit. This in art, in music and in literature. But a sound core remains in this splendid nation that cannot readily be corrupted; therefore he had no fear that the newest craze will damage the permanent art of England. Dealing in greater detail with the story of his variety of styles, Mr. Herkomer was able to illustrate it by pointing to some of his pictures which adorn the walls of the gallery. In the most generous and sympathetically appreciative notice of his work which appeared in Monday's *Daily Post*, the writer had, he said, exactly named the weaknesses of the picture, *After the Toil of the Day*. They were the result of youthful fervour in certain directions. With the assistance of his dear father he had made absorbent grounds to work on that sucked the very life out of the oil-colour. Both *After the Toil of the Day* and the *Last Muster* were painted on the mere canvas, sized, without a bit of oil ground underneath. The story of how the latter came to be painted demands a verbatim reproduction. "A terrible journey from the Alps with an invalid member of my family," said the painter, "a journey that took three weeks to accomplish, left enough courage in me

to tackle a subject that one and all of my best friends and advisers said was an impossible one. The mass of red coats was unpaintable, the background uninteresting; and above all, who would care for a lot of old men? I did not argue with them, but set my teeth, knowing within my heart that I could make something of it. One year's absence from the Academy Exhibition had already troubled me, and I felt that a gigantic effort had to be made to send in a telling picture the following year if I intended to carry forward the good impression already made by my first picture in the Academy. I still retained the little glasshouse and studio in Chelsea, and I determined to do the picture there, although I was already living with my family in a cottage at Bushey. But it was not until after Christmas of the same year, 1874, that I could commence this work. Then came the trial. The strain of the work was enough, but there was more for me to suffer, for when I returned exhausted from town I was surrounded by sorrow in my home that seemed endless. Still I worked—worked as if for dear life. It was ambition, perhaps, that spurred me on, but it was ambition in a worthy cause. Suddenly, when about half-way through the work, nature refused to support the spirit and my health broke down. A week or two was lost in getting back sufficient strength to continue. On again, no time to reflect as to the possibility of a failure; only on, on, to finish it in time. At last the dawn of its completion came, and well within the time of sending it to the Academy. Now my spirit broke down, and I wept over the picture—wept because it was so unlike a Walker. I said to myself, "How could the Academy accept a picture that was so unlike anything that I had ever seen?" And oh! the bitterness of the suspense! Before the week was out, however, the post brought me two letters from two members of the Council—one from Sir Frederick (then Mr.) Leighton, and the other from Mr. George Richmond—expressing the admiration the Council felt for my picture. Mr. Richmond went so far as to say that they showed their appreciation when the picture came before them by clapping hands. Then I wept again, for indeed "my heart was full of tears." The picture caused a burst of appreciation that seldom comes to painters for a single work. Wherever it has been seen it has met with the same success. And now it has gone to Chicago, and we will see what the American nation, with its ingrained prejudice against English art, will have to say to it. After that there was considerable prospecting for new ground, partly to secure freedom, and partly to remove the chances of comparison. He evaded the danger of coming under the tyranny of the masses, so that now the public was not surprised at any new turn he might choose to take in the development of his career. That was a merciful condition, for he felt as much at the beginning of art now as he did twenty years ago, and he hoped still to develop the phase of art that first came to him in those early days. The first link in the chain which is to connect the two periods they would find, he said, in the water-colour drawing he painted last summer, called *The Modern Hagar*. He was very happy about that picture, and he had given it to his wife so that it should not be sold. That it had been done under the influence of J. W. North they would see at a glance, and on the method and beauty of this remarkable painter's work Mr. Herkomer proceeded to an intensely interesting criticism. "I hold it," he said, in approaching his conclusion, "to be the safeguard of an artistic life to follow the fancies of each period, both as to subjects and methods of treatment. Let the artist go through his realistic, his mystic, his sensational or his academical periods. Each has its pivot of action in the brain, and characteristic work will be forthcoming if free play is given to it. Thwart it, and ten to one your work is mechanical and commonplace." Finally, "I dream yet," he said, "of work to be done, great work, work worthy the name of artist; and I pray for life to accomplish my best work in the future. That success has been and is sweet to me it would be affectation to deny; but sweeter than all to me is the feeling that I am still a student."

The President was loudly applauded at the end of his address, as he had often been in the course of its delivery.

TESSERÆ.

Glass Painting in the Sixteenth Century.

AFTER the Reformation in England we may trace a new era of stained-glass, which may be said to have commenced with the seventeenth century. The prejudices of the first reformers having relaxed in certain points relative to the internal decoration of churches, the introduction of so splendid a mass of ornament and of one so congenial with the architecture still remaining, was no longer proscribed by a positive injunction. Our commercial intercourse with the Low Countries, where the arts had begun to flourish and where a school of painting had been established, facilitated the acquirement of stained-glass, which emerging from its former rudeness now exhibited a certain regularity of design. During the reigns of

Elizabeth and James I., armorial bearings and small portraits in circles were the usual decoration of the bay windows in the great manorial halls; but complete scriptural histories, in which the figures were well designed and grouped, were rarely seen excepting in the private chapels in the houses of nobility. James Nicholson was much employed as a glass-stainer in the sixteenth century, and Mark Willems, who died in 1561, is recorded in Walpole's "Anecdotes" as supplying the glass-stainers and arras-makers of that time with designs for their several works. Of that age are windows at Lullingstone in Kent, of the stories of St. Botolph and St. Amphibalus, set up by Sir Percival Hart, knight; the subject of the Crucifixion at Greenwich, in Norfolk College chapel, and portraits of the Tudor family at Battersea Church. The age of Elizabeth and James I. was by no means unfavourable to the art of staining glass. Archbishops Abbot and Laud were liberal encouragers of it. The former had embellished the parish church of Croydon, in Surrey, with many windows of stained-glass, and in the time of the Rebellion there is an account of a man's having been paid half a crown a day for breaking them. He was probably in no hurry to complete their demolition. Many windows are said to have been buried in order to preserve them, which when taken up again were replaced without judgment. About the middle of the reign of James I. Bernard Van Linge, a Fleming, is supposed to have settled in England, but was at all events the father of glass painting in its renewed and improved state in this kingdom. Walpole remarks that the popular notion that the art was totally lost to us was founded in ignorance of the fact; it was indeed dormant, but never extinct, for there is no great interruption in the chain of its chronological history to the present day. As the art was frequently practised by particular families in succession certain recipes may have been confined to them.

Opie and Reynolds.

The portraits by Opie present always a masculine severity of style, in perfect unison with his own general character as a man; not the severity of a distempered and harsh disposition, but of a mind, bold, vigorous and persevering—a contemner of the trifling and ephemeral passions. The innate quality of his mind was highly gifted with the feeling for historical and scriptural subjects, and had the taste of the country tended that way at the time and had his own life been prolonged, it is not too much to presume that an historical school would by this time have been established in England, worthy of comparison with any of the illustrious schools of the Continent. He possessed every requisite to carry such a plan farther than any preceding painter in this country. His lectures partake of the same powerful qualities as his paintings—a native boldness and vigour, finely tempered by habits of acute observation and deep reflection. Without partaking of the polish and elegance of Reynolds or of the classical erudition of Fuseli, yet in fervid eloquence of thought, in truth of observation and in fine critical acumen he is not inferior to the former, and is more practical and instructive than the latter, without also possessing one tincture of the gratuitous irony and irritability of Barry. The painting of Opie, more particularly that of his portraits, although executed in a style bold and broad, yet it does not carry the appearance of colour observable in Reynolds's productions. Opie's touch is decided, and all his paintings seem as though each piece had been painted at once. Sir Joshua's, on the contrary, although worked with great power and decision, always bear the evidence of intense labour and application. Much of this difference must be ascribed to the difference of intellectuality between those two distinguished persons. Opie is matter of fact in everything and never ideal; we never perceive poetical elevation of character, nor refined expression of sentiment, beyond what is actually before him: whereas Reynolds, at the same time that he portrayed the identical individual with every striking peculiarity of character, also infused into the portrait an elevated and ennobling expression of sentiment. This was a power which, in the language of Fuseli, "substantiated humour in Sterne, and mental and physical strength in Samuel Johnson." The mind of Reynolds was of a poetical nature; it was fanciful and imaginative, and consequently in every painting he sought to distinguish the preconceptions of all that is beautiful in colour, light and shade, from expression and drawing, by a prudent and discriminating selection from the varied excellences of his illustrious predecessors. No portrait-painter but Reynolds appears to have manifested so fixed an object to impart to his portraits the majesty and expression of Michel Angelo, the tenderness of Raphael, the elegant and graceful line of Domenichino, the nobleness of Vandyke, the colour of Rubens and the chiaroscuro of Rembrandt.

William Dobson.

Walking one day along Snow Hill, Sir Anthony Vandyke, then a successful painter making a large income, caught sight of a picture in a shop window, and stopped to look at it. It was worth a second look, nay, it was worth the trouble of going into the shop and asking the name and address of the artist.

Having found these out, Sir Anthony, with a love of adventure, determined to visit the painter. He went to the address given, mounted flight after flight of steps in an old house, in a poor neighbourhood, and in an ill-furnished room found a starving painter behind his easel. The handsome face, with long aquiline features, and the look of care in the large dark eyes made their impression on the successful Court painter. His generous heart felt for a fellow artist in distress, and he offered him the hand of fellowship. The obscure painter was William Dobson, the son of a poor gentleman of good rank at St. Albans, who, to gain his bread, had been bound apprentice to Robert Peake, a picture-seller near Holborn Bridge. Peake was a bad artist, but a good royalist, and in after years wielded his sword with better success than his pencil, fought for the king, defended and was taken prisoner at Basing House, and was knighted at Oxford in 1645. Dobson was born in Holborn in 1610, and from Peake he learned the rudiments of painting, and is said to have studied later under Francis Cleyn. But though he gained little by the instruction of the loyal picture-dealer, he learned in his shop the works, if not the words, of great masters, and the grandeur of Titian and the elegance of Vandyke taught their copyist the best parts of their art. Sir Anthony found him worthy of his generosity, took him from his wretched lodging and supplied him with the necessities to pursue his occupation in peace. He afterwards introduced him to Charles, and Dobson was made. On the death of Vandyke he was appointed serjeant-painter and in 1642 accompanied the king to Oxford, where Charles and Prince Rupert sat to him. The young artist had already achieved his reputation as a portrait-painter and was almost as great a favourite as Vandyke. But Dobson, like his friend, was extravagant, and ere long Charles was too embarrassed to help him. He fell into debt and was thrown into prison, from which he was released only to die, in 1646, at the early age of thirty-six. Had he lived longer and studied under a good master, still more, had he visited Italy, as Rubens and Vandyke had, there is little doubt that William Dobson might have taken his place by the side of those masters. As it is he is the best painter that England produced before Hogarth. He painted chiefly portraits, but his taste for historical subjects is shown in the manner in which he grouped his sitters.

Varieties of Gothic.

The differences in style in old buildings is very great, and the result of various causes. It is to be observed, first of all, that though Mediæval art is in one sense entirely harmonious in all parts of Europe, it is generally true that it is subdivided endlessly by little distinctions of district, province, or country, which serve practically to create endless varieties of style or detail, all in progress at the same time. It has been very much the custom to assume that these local varieties indicate divergences of principle, so that it is not safe for one man to study more than one of them. This is simple nonsense, for it may much more truly be said that no one does understand Gothic art who has not studied that of more than one country; and it is most undoubtedly true that there is as much difference in the style of old buildings in the various countries, districts, or provinces of one country as there is between any one of these and some variety of the work of another country.

Patronage of Art by Charles I.

It is to the honour of Charles that he took the greatest pains, and expended the largest sums, in inducing foreign masters of celebrity to visit and even settle in this country; and as a patron no less than as a collector, his name stands out pre-eminently among our sovereigns. He was not only the first, but also the last of them who valued art for its own sake, and he appears to have been the only English king who could thoroughly appreciate it. It is from this cause that the names which adorn his reign are more in number and greater in renown than those of his predecessors and successors alike. Henry VIII. had employed Mabuse and induced Holbein to settle in London; Elizabeth sat in fantastic dresses to Federigo Zuccherò; James patronised Cornelius Jansen, an imitator, if not a rival, of Vandyke, and the portrait-painter Van Somer. On the other hand, the languid mannerism and luxurious draperies of Sir Peter Lely found favour with Charles II., who paid a salary to William Vandervelde and bought the perfect sea-pieces of his yet more celebrated son; Kneller was the chief ornament of William's reign, and Jan Wyk fought the battle of the Boyne on canvas for him. When we add that under the first of the Brunswicks Watteau struggled for one year in London, Vander Myn lived sumptuously and died in poverty, while Denner brought hither one of the productions of his marvellous industry, we are ready to compare the celebrity of these names with that of the artists who were associated with Charles I. The historical and portrait-painters whom he gathered around him were Rubens, Vandyke, Gerard Honthorst, Gentileschi, Hanneman and our own Dobson. For portraits alone there were Beck, Mytens (Daniel not the better known Martin), Artemisia Gentileschi, John Hoskins and Nicholas Lanier. Poelmburg and Wouters painted landscape for him, the younger Steenwyck architecture, Gerbier

miniature, and the dissolute Torrentius drinking cups and still life. Nor were the kindred arts unrepresented. The best architect England has produced since the Reformation built for his palace one of the greatest ornaments of the metropolis to this day, little thinking that the scaffolding he then used would, in after years, be replaced by one prepared for his master's death-block. The statue of Charles at Charing Cross is very fair evidence of the talent he patronised in that branch of imitative art. Hubert le Sueur, who designed and cast it, was a Frenchman, who appears to have settled in England and produced many works, of which, however, this statue and one of William, Earl of Pembroke, at Oxford, are said to be the only two that remain.

The Church of St. Gommaire, Lier.

The town of Lier is reached by the Antwerp and Turnhout Railway. It possesses a great cross church of cathedral size, with chapels round the choir, western tower and central spire. It is for the most part transitional from Middle-Pointed to Flamboyant; and, except perhaps in Mechlin Cathedral, there is no building in Belgium to surpass it in the beauty of its details. The apse recalls that of Amiens; its five arches, stilted, and with the finest mouldings, its five two-light windows and stained-glass are altogether very noble. The choir has three bays, the transitional clerestory windows are of six lights, with grand tracery, and the balustrade in the triforium is elaborately worked. The seven eastern chapels are of later date and less remarkable. The chancel aisles are of much the same character with those in the nave. The transepts are enormously high, and have the peculiarity of a projecting nine-sided apsidal chapel at the east. The great window in the north transept of eight lights, in two divisions, is Flamboyant, but with an almost ultra-Perpendicular effect, the central mullion running up to and bisecting the apex of the arch. The three west clerestory windows of this transept are very early Flamboyant, of six lights, and of the most magnificent work. The great window of the south transept, also of eight lights, may be fairly called Middle-Pointed, except that the wheel in the head has some tendency to Flamboyant. The rood-loft is the finest in Belgium. It projects west, has three arches facing due west, and one on each side obliquely facing north-west and south-west. Above these arches is a series of panels containing scenes from the Passion, beginning at the Betrayal and ending at the Crucifixion, three over each arch; but in the centre, above the entrance, is a kind of projecting pinnacle, carrying the image of St. Gommaire, the patron saint of the church, and having in niches below two of his miracles. The piers of the arches are of black polished marble. Nothing can be more exquisite than the whole design and details of this rood-loft. The nave has six bays, besides the tower; the piers are simple, circular, with octagonal capital and double octagonal base. The clerestory is of five lights and exceedingly rich; hardly any one of the windows throughout the church has been, as is so universally the case in Belgium, gutted. The aisle-windows are a mine of transitional enrichments; the south aisle, indeed, can scarcely be said to go beyond the bounds of late Middle-Pointed. There are eight windows of five lights (except the eighth, which has only three); the tracery of almost all is different; nothing can be more varied and beautiful. The tower, which is not equal to the rest of the church, is square to the height of the nave roof, then octagonal, and capped with a most vile cupola. The western porch has three exquisitely beautiful niches over its inner door, and its sides are arcaded in late Middle-Pointed work. On the whole, this church is far better worth a visit than many of those in Bruges or Ghent, which everyone goes to see.

The Kremlin, Moscow.

All the most remarkable buildings of the Kremlin were erected during the reign of Ivan III. or that of his successor, Vassili. The walls and towers of that enclosure were constructed by two Italians, Marco and Pietro Antonio, between the years 1485 and 1492. The banquetting-chamber which subsists at present, as described by Jenkinson in 1557, "A fair great hall, in the midst whereof is a pillar, four square, very artificially made," was begun by Marco in 1487 and finished in 1491 by Pietro Antonio. The Palace of the Czars is the work of a Milanese named Alevisio, who began it in 1499 and finished it in 1508. The church of St. Michael was completed by the same architect in 1507. But the buildings of the Kremlin must not be considered in detail. Mean and insignificant as many of them are if minutely and separately examined, the effect of the whole when seen from almost any point of view is, beyond conception, stately and picturesque. The strange and brilliant summits of so large an assemblage of churches, the contrast of bright colours with which many of them are painted, the curious architecture of the mural and other towers, and above all the Palace of the Czars, with its terraces, balconies, flights of steps and remarkable roof unite to form a picture of more than ordinary richness and pomp, to which, indeed, all Europe cannot furnish a parallel, except, perhaps, on the shores of the

Bosphorus. It will not be forgotten that this striking group of buildings, after having escaped destruction by fire during the great conflagrations which ravaged Moscow in 1547, in 1571 and on the arrival of the French in 1812 was mined in two places by those insatiate marauders on the eve of their memorable retreat. Fortunately, no object of primary interest has suffered irreparable injury from the effects of this wanton explosion, for which the obsolete military character of the Kremlin may have furnished a miserable pretext, but of which the real motives are nowhere to be found but in the mischievous malignity of disappointment.

Archæology and Art.

It is curious to observe how important a place archæology occupies and must occupy in modern art. There have been times when such a thing as "keeping" was unknown, and the most incongruous anachronism shocked no one. No Mediæval architect, for example, ever dreamed of reviving or perpetuating a defunct style; and the earlier artists clothed their Holy Families or saintly groups in the habits of their own period. Garrick saw nothing absurd in acting Julius Cæsar in a full-bottomed wig; and, except for the ill-omened precedent of the revival of the costume of Brutus at Paris in the days of the Terror, it has been left for our own day to see the Westminster play acted in practicable togas, and the Shakespearean dramas revived with archæological properties and proprieties. We live in an age of criticism, and are never satisfied unless the unities of a work of art are observed religiously, and all its accessories are congruous and "in character." It is useless to lament, as some do, this "over-consciousness"—to borrow a phrase from ethics—this almost exaggerated attention to the minutiae of externals, and to long after the careless freedom of less artificial times. We must take things as we find them, and submit to a certain pedantry as a general characteristic of the age. Art and literature, at least in the old world, have a historic past which moulds the present, and which foreshadows the future. Hence it is that the healthiest and most promising artistic efforts of the day have, in one point of view, an archæological aspect; and neither the inventive painter nor the daring architect can dispense with the humbler labours of the plodding antiquary.

San Micheli as an Architect.

San Micheli was an architect of great abilities, and of a genius more bold and masculine, but less elegant than Palladio's. This is proved by his apparent preference of the Rustic and Doric styles to the Ionian or Corinthian. Of his architecture at Verona the Palazzo Pompei is perhaps the best specimen. The lower storey is Rustic, with an arched entrance and windows; above is a balustrade, over which rise eight single fluted Roman-Doric three-quarter columns, with a continued Doric frieze and a deep cornice. In each intercolumniation is a round arched window, with a head for a key-stone, the middle bust being a Bacchus and the others rather grotesque masks of satyrs, with rams' horns. There is a simplicity about this façade which is very noble and striking. The Palazzo Bevilacqua, also designed by him, is of two storeys, Rustic, with pilasters, and over them a continued projecting balustrade and Corinthian columns fluted perpendicularly and spirally, with a continued entablature and rich frieze. The contrast between the Corinthian and Rustic storeys is too strong, particularly as the former is overloaded with ornament, the ostentatious effect of which is increased by the spiral fluting. Altogether, we should say that it is neither grand nor elegant, but certainly rich and handsome, and its projecting balustrade and continued entablature have a fine effect. The Palazzo Canossa and that of the Gran Guardia, which is Rustic and Doric, are in much better taste, uniting much simplicity with sufficient richness. The Capelli Pellegrini in the church of San Bernardino, also at Verona, is a specimen by Sammiceli of a different description from those we have mentioned. It is a circular edifice of Corinthian architecture, rather deformed by the alternate pairs of columns having spiral flutings, yet upon the whole simple and elegant. The Palazzo Grimani, on the Canal Grande at Venice, is another noble specimen of his skill, and is indeed one of the most magnificent buildings in Italy. It is of three storeys, the lowest supported by fluted Corinthian pilasters and the two others by fluted three-quarter columns, also Corinthian, and is the only instance with which we are acquainted of the repetition of the same order.

Velasquez.

Velasquez was emphatically a man, and the painter of men. He was aware of his strength and weakness; his greatest works—*Las Lanzas*, *Los Bebedores*—have no women in them whatever; and in the *Hilanderas*, a group of females, he has turned aside the principal head in the background, leaving it, like Timanthes, to be supplied by the imagination of the spectator. He was, moreover, a painter only of the visible tangible beings on earth, not the mystical, glorified spirits of

heaven; he required to touch before he could believe—a fulcrum for his mighty lever. He was a man of strong genius, but no enthusiast. Nature was his guide, truth his delight, man his model. In things mortal and touching man, Velasquez was more than mortal; he is perfect throughout, whether painting high or low, rich or poor, young or old, human, animal, or natural objects. His dogs are equal to Snyders; his chargers to Rubens—they know their rider, prancing under knights and ambling under ladies fair. When he descended from heroes, his beggars and urchins rivalled Murillo; while the waggish wassail of his drunkards shows how much less repulsive such subjects, if he had ever repeated them, would have been in his hands than in those of a Dutchman. Nor, if he had devoted himself to landscape, would Spain have wanted her Poussin or Wilson, for, as Wilkie truly says, his scenes are full of the "very air we breathe"—local colour, freshness and daylight, whether verdurous court-like avenues, or wild rocky solitudes. Lastly, his historical pictures are pearls of great price; never were knights and soldiers so painted as in his *Surrender of Breda*. His style was based on Herrera, Carravaggio, Ribera and Stanzioni—an assimilation of all, not a servile imitation of any; while his conceptions were new, fresh, and entirely his own. His drawing was admirable, correct and unconstrained; his execution, technical skill and mastery over his materials complete; his colouring was clear and clean, and laid on at once with a single projection of mind; he seldom used mixed tints; he painted with long brushes, and often as coarsely as floor-cloth; but the effects when seen from the intended distance are magical, everything coming out into its proper place, form and tone. Yet no man was ever more sparing of colour. He husbanded his whites, which, like Rubens, he thought poison except in lights, and even his yellows, which tell up-sparkling like gold on his undertoned backgrounds; these, especially in his landscapes, were cool greys, skies, and misty mornings—nature seen with the intervention of air. He painted with a rapid, flowing and certain brush, as by mere volition, and with that ease, the test of perfection, that seeming absence of art and effort which made all imagine that they could do the same—until they tried and despaired. The results obtained are so true to nature that first beholders, as with Raphael at the Vatican, are sometimes disappointed that there is nothing more. He was above all tricks. There is no masking poverty of hand or mind under meretricious glitter; all is in sober, real, sterling simplicity. No painter was more objective. There is no showing off—no calling attention to the performer's dexterity. His mind was in his subject, into which he passed his whole soul. He clearly conceived his idea, and worked it rapidly out with directness of aim, unity and compression of composition; he knew what he wanted, and—which few do—when he had got it. Then he left off, and never frittered away his breadth or emphasis by torturing details or superfluous finish to mere accessories. These were dashed in *con quatro botti*—but true, for he never put brush to canvas without an intention and meaning. His was the true philosophy of art, the selection of essentials, of all that first and last attracts and addresses itself to the eye, mind and heart of spectators, whom he left to infer the secondary:—*Aquila non captat muscas*.

Principles of Architecture.

The great principles on which architectural beauty and grandeur depend appear to be these, utility, simplicity, variety, richness or ornament, and to these may be added a fifth quality, where it is applicable, magnitude. Many critics would perhaps increase the list by introducing proportion into it, but in all cases the beauty of proportion may in a very great degree be referred to one or other of the qualities before mentioned. The merit, then, of any species of architecture must consist in its possessing the four great characteristics of utility, simplicity, variety and richness, or, at any rate, the three first, which may be considered as absolutely essential. In the union of these certainly lies the difficulty of architecture and the merit of the architect, and from their extraordinary union in the Grecian columnar temple arose the great beauty of that species of building. The two qualities which are peculiarly difficult to unite are simplicity and variety, and they are so because in a considerable degree contrary to each other. Without the first a building may be considered as tawdry, and without the second as poor. These two almost opposite effects were produced by the Greek architects in those edifices which have obtained for them the never-failing admiration of every age of taste and refinement. The leading principle of Grecian architecture is straight, or rather horizontal and perpendicular lines, and from adopting these in all the great parts of the building much uniformity and simplicity are at once attained; to contrast with these and to produce variety curves are as studiously introduced into all the details—the columns are circular in their shafts; their flutings, their bases, the *cima recta*, *reversa*, &c., of the entablature are merely varieties of curves, and the most graceful curves in nature are imitated in the capitals and friezes. Again, variety was obtained in a different manner and in a much greater

degree by the alternation of strong light and deep shade produced by the colonnade of a temple. This last and most important species of variety, it may be remarked, equally exists in the Doric order, which possesses but little of the other ornaments of Grecian architecture, and its characteristic is therefore rather grandeur than beauty, though it sometimes received a magnificent degree of ornament from the insertion of the finest sculpture in its metopes and pediments. The variety produced by the alternate play of light and shade in the colonnades of the ancients would have been too great for unity and simplicity if they had not added long and continued entablatures above and frequently steps below, thus binding, as it were, the columns together and uniting them into one whole. To all these was added the pediment, a part of the building absolutely necessary for its utility and of great beauty when not too high. The Greek architects were quite aware of the necessity of this qualification, but their imitators at Rome were not, if we may judge from the comparatively acute angle of the pediment of the Pantheon, while, on the other hand, there are beautiful instances of low pediments as applied to the Corinthian order in the temple at Assisi and in the Maison Carrée at Nîmes. Why a pediment of a low pitch should please the eye more than one of an acuter angle may be difficult to ascertain; we conceive it to be because it is more consonant to the horizontal lines which prevail in the edifice, and because it suggests the ideas of a finer climate and of more skill in the architect in adapting his roof to it.

Importations of Foreign Art.

In the time of Henry VII. and Henry VIII. we had scholars of Ghirlandaio, Giorgione and Raphael, and after welcomed Holbein, Zuccaro, Rubens, Vandyke, Lely and Kneller, down to Ricci, Zuccarelli, Cipriani, Canaletti, Zoffany, Angelica Kauffman and Fuseli. Scarcely a piece of sculpture do we call our own until the days of Flaxman, Bacon and Chantrey. It is said that the statuary which encrusts many of our cathedrals is the produce of an old English school of sculpture. The fact, if so, evinces either a great lack of national pride or a great carelessness about art, since their countrymen have not deemed their names worth preserving, though we hear enough of Torregiano's bronzes, Holbein's terra-cottas, Hubert le Soeur and Fanelli's statues, under the Stuarts; Roubiliac and Rysbrack in the last century; and the matchless resemblances by the Fleming Nollekens in the present. It had even come to this, that an English surname sounded strange in a sculptor, so Mr. Turner became Signor Turnerelli. In France the same practice of adoption may be observed, tending rather to the development than the hindrance of native talent. Leonardo da Vinci, Cellini, and the whole school of Fontainebleau, stored the cabinets and châteaux of France with materials of study and improvement. Giulio Romano supplied Francis I. with his painters, and his scholar, Primaticcio, with decorators in stucco and fresco. Bernini formed a new school of sculpture in France, and the honours with which he was received bore a striking testimony to the estimation in which art and artists, of whatever country, were held by Louis XIV. In Spain, which had painters of her own, the patronage of Titian and Pellegrini by Philip II. proved both his taste and his freedom from national prejudice. On the other hand, the example of that country may serve to warn us that secondhand art is a lottery, and only good at the right season and for a well-considered purpose. When Philip II. enriched Spain with the great Italian pictures, which he imported at prodigious cost, he was nearly the only person in the country capable of appreciating them; and, by the time that a taste for the highest style of Italian art had taken root there, those Spaniards who went to study it at headquarters unfortunately arrived in Italy when the Bolognese school was triumphant and taste declining. Velasquez, who stands single, like Truth herself, may be said to have escaped this taint. A slight influence from Rubens is by some observed in him, but nothing from Italy. Then came Luca Giordano, whose success and favour at the Spanish court had a most baneful effect (may no Luca *fa presto* visit our shores); his facility in the execution of vast fresco works, with little other merit but facility, set the fashion, and called forth a tribe of insipid followers. His brilliancy and clearness of colouring they never could surpass; whilst they lost, in the pursuit of a foreign excellence, the nature and originality of their own schools. Italy has ever been freer than any country from a jealousy of foreign artists; to be sure she can afford it. One proof may suffice—the employment, namely, at the Papal Mint for nearly a century of that celebrated series of artists, all of the Bavarian family of Hainneran Hermanskerker. Under fifteen pontificates their papal medals were unrivalled for workmanship. They formed, of course, a school; and the Italians wisely profited by it. Louis XIV. in vain made them the most splendid offers. How eminently the Germans are indebted to the agency of foreign influences may be shown by tracing out their actual taste and proficiency in art. Their æsthetic of the most subtle graces of Raphael is certainly no inspiration of Albert Dürer, nor transmitted to them through his countless pupils. Their profound refinements on the theory and principles of art, which baffle

our practical understandings, are not based on native productions, but rather are metaphysically begotten through an intense appreciation of the Greek *chef-d'œuvres* at Munich and the pictorial treasures at Dresden.

The Specific in Landscape Painting.

The true ideal of landscape is precisely the same as that of the human form, it is the expression of the specific—not the individual but the specific—characters of every object in their perfection; there is an ideal form of every herb, flower and tree: it is that form to which every individual of the species has a tendency to arrive, freed from the influence of accident or disease. Every landscape painter should know the specific characters of every object he has to represent—rock, flower or cloud, and in his highest ideal works all their distinctions will be perfectly expressed, broadly or delicately, slightly or completely, according to the nature of the subject and the degree of attention which is to be drawn to the particular object by the part it plays in the composition. Where the sublime is aimed at, such distinctions will be indicated with severe simplicity, as the muscular markings in a colossal statue. Where beauty is the object, they must be expressed with the utmost refinement of which the hand is capable. This may sound like a contradiction of a principle advanced by the highest authorities, but it is only a contradiction of a particular and most mistaken application of them. Much evil has been done to art by the remarks of historical painters on landscape. Accustomed themselves to treat their backgrounds slightly and boldly, and feeling (though only in consequence of their own deficient powers) that any approach to completeness of detail therein injures their picture by interfering with its principal subject, they naturally lose sight of the peculiar and intrinsic beauties of things which to them are injurious unless subordinate. Hence the frequent advice given by Reynolds and others to neglect specific form in landscape, and treat its materials in large masses, aiming only at general truths—the flexibility of foliage but not its kind, the rigidity of rock but not its mineral character. In the passage most especially bearing on the subject (in the eleventh lecture of Sir J. Reynolds), we are told that “The landscape painter works not for the virtuoso or the naturalist, but for the common observer of life and nature.” Yet the sculptor is not for this reason permitted to be wanting either in knowledge or expression of anatomical detail, and the more refined that expression can be rendered the more perfect is his work. That which to the anatomist is the end is to the sculptor the means. The former desires details for their own sake, the latter that by means of them he may kindle his work with life and stamp it with beauty. And so in landscape, botanical or geological details are not to be given as matters of curiosity or subject of search, but as the ultimate elements of every species of expression and order of loveliness.

Palladian Innovations.

When Palladian architecture became universal through Italy its promoters seem to have considered as authority every building that was ancient, and it in consequence frequently happened that most barbarous edifices rose “like exhalations.” In these buildings, and particularly in the fronts of the churches, were seen columns placed on high pedestals supporting entablatures that projected over each column; over these, columns of a different order; above, another broken entablature, ending frequently in a high pediment, cut in the middle like a mitre as if to catch the rain instead of driving it off, these columns being only three-quarters, and very possibly the entablatures and pediments over the doors and windows also broken. Thus were produced buildings totally deficient in every principle of Grecian architecture, having neither the repose of flat surfaces, nor the simplicity of connected lines, nor the variety produced by the alternate play of light and shade, and perhaps full of ornament in every part except where the ancients bestowed the greatest richness, the frieze and the pediment, which were left entirely plain. Of all these defects the breaking the summit of the pediment is certainly the worst, and is believed to be entirely without ancient precedent in the Classic lands of Greece and Italy. It is frequently accompanied by another barbarism equally unauthorised—that is, when the upper colonnade is narrower than the lower on account of the side aisles, of placing on each side of the upper storey a sort of ugly volute or ear. The churches built by the father of modern architecture are not free from several of these defects. The palaces built in his age are perhaps generally better than the churches. Those by himself at Vicenza are not in general the best of the time, but we should recollect that the taste and science of an architect are frequently obliged to bend to the ignorant caprice of his patrons. This has been the case with respect to the Palazzo Chiericati at Vicenza, a very magnificent design in its greater parts and of very pure taste, but very much injured by ugly stucco ornaments over the windows and miserable statues and pinnacles on the roof. The latter must have been additions to the original design, as they do not appear in the engraving in Palladio's works.

NOTES AND COMMENTS.

THE instruction in building construction, metal-working, plumbing and other technical subjects given in the Walker Engineering Laboratories, University College, Liverpool, appears to be as successful as the late founder, Sir A. B. WALKER, could have anticipated. According to Professor HELE-SHAW'S report, which was read on Tuesday, the engineering students now number seventy-five. The improvement in the nature of the work kept pace with the increasing numbers. There were 18 entries in the metal-working class, and 22 in the wood-working class. The exhibition of 80 pieces of plumbing-work was an indication of the kind of work which was being done by the apprentices under the instruction of a body of working-men, who had from the beginning organised and conducted these classes under the name of the Liverpool School of Plumbing. There had been 28 entries and 777 attendances during the session. The Professor said that the time had now come when the work of technical education, being entrusted to the city council, would enable the complete organisation throughout the whole of Liverpool to be so carried out by means of centres judiciously placed in various localities that the college would be able to undertake its natural function as a general centre for the advanced classes up to which the various subsidiary centres would naturally lead, and the qualifications for which would be a certificate of attendance and proficiency attained from one of the out-lying centres. The working-men themselves, by their exhibition scholarship scheme and their resolution to appoint the scholars from the successful candidates, had shown the way in which this might be accomplished. Ten scholarships of 3*l.* each would be awarded on the results of the work of those classes. If a higher class of work were to be undertaken in the Walker Laboratories to which the out-lying centres would lead, the work must necessarily be more limited in its character; and if the working-men were to obtain access to the testing-machine and the more refined apparatus of the Walker Laboratories, they could not be accommodated in such large numbers as had applied, and would have to pass into that work as the result of a process of graduation, since higher teaching could not be done on the wholesale principle. The scheme adopted for the third session of the penny technical lectures differed slightly from that of the preceding years, inasmuch as, in addition to the regular classes in the two subjects, machine drawing and building construction and drawing, which represented the most important industries of Liverpool—the engineering and the building trades—there had been six special short courses of three lectures each. The students at the penny technical lectures and the short course of lectures numbered 428, and the total attendances were 1,688.

A JUDGMENT given by Lord Justice LOPES, on Monday, will not be considered as satisfactory to mortgagees. The Tottenham Local Board claimed 113*l.*, proportion of expense of paving, sewerage, &c., a new road, from the defendant, who was only second mortgagee, but who was for a time the receiver of the rent. The board relied on the definition in the Public Health Act, "That the owner is the person for the time being receiving the rack-rent of the lands or premises, whether on his own account or as agent or trustee for any other person." The defendant did not receive any rents after June, 1892 (the claim was made in March, 1892), and what he received previously was of no benefit to him, for the whole sum had to be handed over to the first mortgagee. Lord Justice LOPES considered that the question to be decided was whether the defendant was "owner" of the houses at the time when the expenses were "estimated" which were afterwards apportioned by the surveyor. The Act pointed, in his opinion, to the time when the expenses were estimated, not when the work was completed. The defendant had at the time been in receipt of the rent, and so up to the time of action, and his lordship was of opinion that the intention of the Legislature was that any person who has received the rents from the occupier should be deemed the "owner." Cases might

arise when it would be difficult to find the real owner, and therefore it was deemed desirable to make the actual receiver of the rents liable. Accordingly judgment was given in favour of the Local Board.

BUILDERS will do well to hesitate before they put in the phrase, "in the best possible manner," in the proposals they draw up when seeking work. In the Hereford County Court the words have caused judgment to be given against a builder, although there were doubts in the case. The plaintiff's house at Orcop was injured by a fire, and, as a result, he entered into a contract for work that might be called rebuilding. It was alleged that the rain came into the new house, the floors shrank, and generally the woodwork was unsatisfactory. But, in spite of the defects, the plaintiff paid the price agreed on, his excuse being that his neighbours were saying he was unable to pay. It was also admitted that the price paid was low. An architect was called in, and he said the work was "scamped" from beginning to end. The spaces between the floor boards were about $\frac{3}{8}$ to $\frac{1}{4}$ -inch wide. The chimneypieces were badly constructed, and unsafe. The joints in the stairs had sprung, and the wood split. The whole of the wood used for the doors was unseasoned, and the doors were of little use in keeping out the draughts and rain. Daylight could be seen through the slates, and the house was one mass of damp. Another architect, called on behalf of the builder, said he thought the work had been done according to the specification. The state of the floor could be put down to the season in which the work was executed. The specification specified a cheap job. He had seen evidences of wet having come in, but he thought it had entered during the time the snow was about. All buildings, however, would be liable to the same thing unless special provision were made. The judge said he should have thought that any defects which might have existed would have been discovered during the first winter, and action taken at latest in the following spring, but no doubt action was delayed because defendant looked to plaintiff as a friend. He thought, however, the specification was loose. No doubt builders were in the habit of putting in the words "in the best possible manner." There must be some meaning attached to them, but if not, the sooner they were left out the better. In giving judgment for the plaintiff, he said he must take into consideration that the estimate of what was required to be done was not made until about two years after the work had been completed, so he should therefore give judgment for 25*l.*, the usual costs to follow.

AMENDED building regulations were adopted in Chicago on the 13th inst. The greatest height allowed for buildings will be 130 feet instead of 160 feet. A department of city government, to be known as the department of buildings, embracing a commissioner, a deputy commissioner, a secretary, and such inspectors and other officers as the City Council may provide, is to be established. The commissioner is required to be an experienced architect, civil engineer or builder, and will hold office for two years. He is given the power of inspection over elevators, fire-escapes and all classes of buildings, and is required to establish rules and regulations for inspections and erection of structures. The inspectors are required to be skilled labourers, and before their appointment are required to pass an examination before a committee consisting of one member each from the Builders and Traders' Exchange, Building Trades Council, Underwriters' Association, and Illinois Chapter of the American Institute of Architects. The commissioner and inspectors are empowered to enter all buildings for the purpose of ascertaining whether the regulations have been complied with, and in case the department decides against the security of any work in process of construction, the persons interested are allowed an appeal to a board of arbitration. The power of the commissioner to take down and demolish dangerous walls is confirmed, and an amendment establishes a board of arbitration to act in certain cases.

Glin Architect, March 31st 1893.





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ANTOINETTE VAN ROSEMAIL AND THE EARLY FLEMISH REFORMERS.

From the painting by Monsieur A. HENNEBICQ.



PHOTOGRAPHED BY B. LEMERE & CO.

rh 31st 1893.



INK PHOTO SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

TWICH.
HOLLS, Architect.

The Archibiter, March 31st 1893.



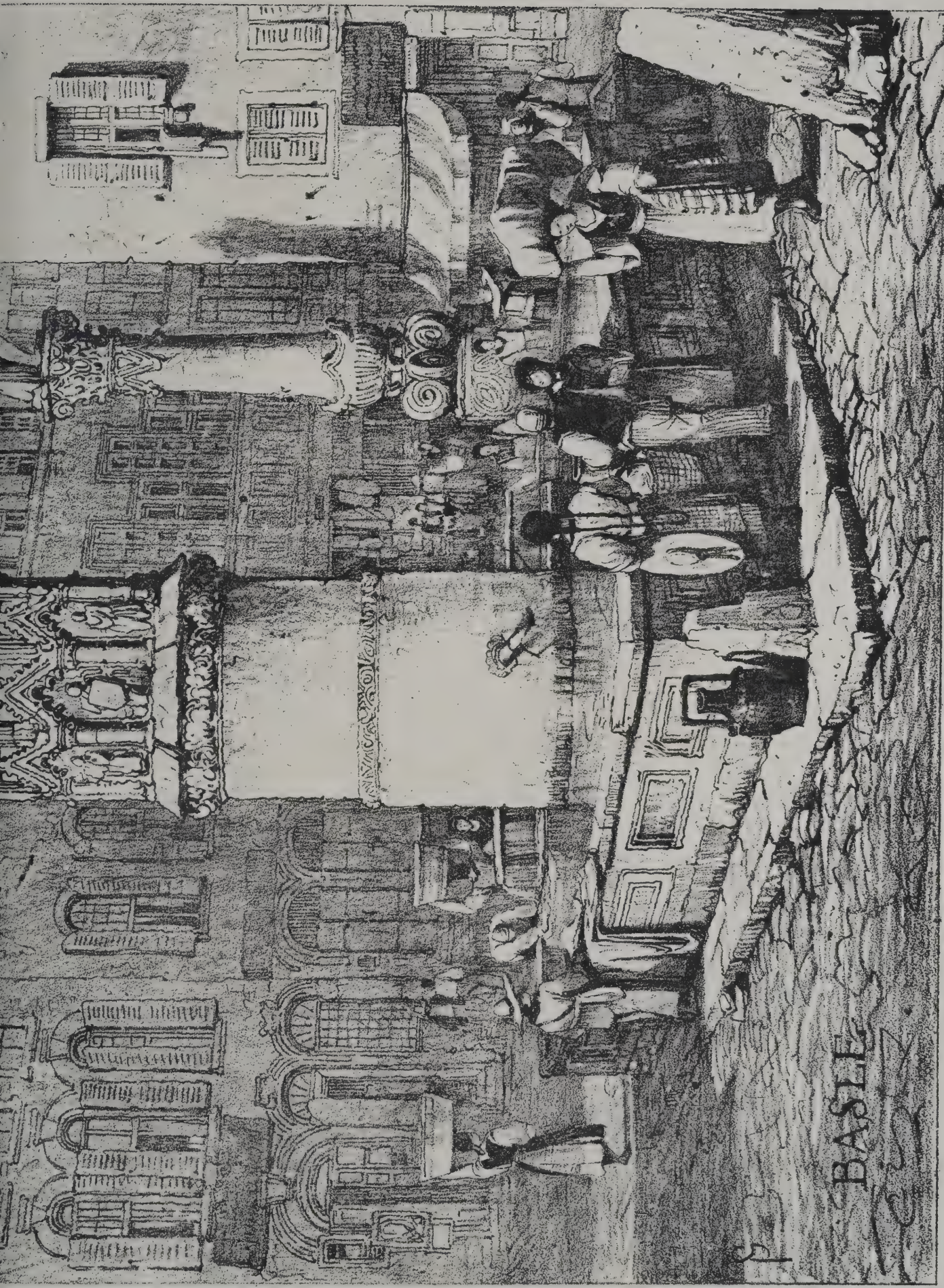


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BASLE.
Drawn by SAMUEL PROUT.

ILLUSTRATIONS.

ANTOINETTE VAN ROSEMAIL AND THE EARLY
FLEMISH REFORMERS.

OWING to the position of the Spanish Government the power of the Inquisition in the Low Countries was intolerable, and was enough to urge the people into opposition against any system of which it was an agency. As a consequence, not only burghers but women were driven to take part in an agitation for a reform of the Church. The Flemings still remember the influence of ANTOINETTE VAN ROSEMAIL, who was able to persuade not only monks, but scholars and men of science to co-operate with her, and there is no doubt her efforts had much to do with freeing the country from a foreign yoke.

IMPNEY, DROITWICH.

A VIEW IN BASLE.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary meeting of the Association was held on Friday evening, Mr. Paul Waterhouse, M.A., in the chair. A vote of thanks was passed to Mr. Dellissa Joseph in connection with the last visit.

Mr. J. A. GOTCH read a paper as follows, entitled—

In Praise of a Country Practice.

Mr. Gotch said:—If you will tear yourselves away from the delights of London, shrouded, as they often are, in smoke and fog, I should like to place you in the windows through which I look every day of my life and show you a glimpse of some characteristic Midland scenery. Large undulations terminate the view on every side. In one direction the sombre tints of the earth are divided from the pale sky by the deeper hue of a distant wood. In another a white road winds out of sight over the shoulder of a gentle declivity, which permits a glance at the dim blue distance of the next county. On a third side one or two slender spires overtop the hills as they shoot up out of their masses of foliage; while straight in front of us, just across the valley which parts us from the town, rises the grey mass of the tower and spire of the parish church, with its battlements and turrets and crockets sharply defined against the sky. It is not merely in its beautifully tapered outline—unsurpassed by any spire in the land—in its crisp and vigorous delicacy, or in its curious angle turrets, that seem to be an echo of the defensive features of a castle—it is not only in these that its charm lies, but also in its ever-changing aspect, responsive to the changes in the atmosphere. Sometimes it thrusts its summit, dark and delicate, above the morning mist which hides all the lower part, together with the earth that supports it. Sometimes the hot summer sun picks it out with sharp shadows in front of the blue sky, leaving it still—sunlit though it is—darker than its peaceful background. And then again, sometimes—not often—the evening sun will paint it white against black, storm-laden clouds, lending it an almost terrible aspect, like the white lips of an angry face.

At its base, stretching away on either side, lies the town, red with red bricks and blue with blue slates, here and there in the older parts somewhat mixed with grey stone and largely mollified with trees. But as it recedes from the church the town grows redder and redder till at one end it stops with a mass of white-brick cottages that mark a newly-developed building estate, while at the other it breaks up into detached houses that show how the moneyed men are gradually building their way into the country. The town is no less interesting to us than the church, though in a different way, for there lies our work and there live our clients.

You who live and work in this great wilderness of London have but a faint idea of what it is to live among your work and among your clients. The vast journeys that separate you from the former half remove it from the realms of tangible reality. To you it is less a living fact than a kind of simulacrum on paper. Your decisions on unexpected matters of construction are often more or less theoretical, not dictated by the lively knowledge which an inspection on the spot imparts. You cannot watch its constant growth, brick by brick and stone by stone, and see your design slowly evolve itself, till the amorphous mass of the ground floor develops into articulate shape with the roofs. To you the building grows by leaps and bounds, and to some of you, perhaps, it never grows at all except as an abstract thing in mechanical drawings.

How much more difficult it is for those who pay only a flying visit now and again to their work to introduce those little touches which spring from, and harmonise with, local circumstances not observable till the building is partly built. How

much easier it is for those who can watch the effect of their mouldings from day to day to improve upon them as occasion arises, and to modify them to meet slightly altered conditions. For instance, if a string-course is hardly as effective as it should be, three steps will inform you how much the mason has worked—and he cannot have worked much since you saw him last—and a very little adjustment will probably enable you to use the disappointing member elsewhere, while a slight recasting of the detail will give all you desire. Or if a chimney-cap has not the delicacy of profile that you expected, before another one is worked you can remedy the defect; and all without waste of stone or hindrance to the work. Then, again, how valuable it is to spend ten minutes now and then in quiet contemplation, free from the importunities of foreman or clerk of the works. What object lessons one obtains as one watches how the necessities of the plan control the masses which compose the picture for the eye; how this chimney seems a false note, or that window ruins the privacy of some garden nook, or how yonder little bay, which is a delightful feature inside, seems but a sad excrescence on the outside, and moreover brings into view things better left unseen. It is from melancholy observations like these that one departs a sadder and a wiser man, with a resolve to do better next time, and gradually one is able to store up a mass of experience and observation which instinctively guide the pencil in the future. No doubt you who live in London indulge yourselves in these object lessons, but we who live in the country can do it so much oftener; and while you are stifling in the Underground Railway or swaying in the open air on the top of an omnibus furnished with what are called by way of mockery “garden-seats,” we can call in *en route* for the office and take a quiet look round at the work.

It is true that we suffer some disadvantages. We cannot repeat ourselves too often; we have to be careful in what houses we use our last and grandest design for a chimneypiece, but then we generally know what people call upon other people, and whether they are likely to see the interior of each other's houses. We have to be careful, too, how we make mistakes. You happy persons who conduct vast practices from London in remote corners of the land can afford to make mistakes in some of the remoter corners. First of all, are you not “London architects?” and does not that term endow you with a skill and knowledge impressive to all but the immediate sufferers and their intimate friends? And, granted that the mistake is so egregious as to convince even the indifferent, and to close your prospects of further work in that particular corner, why the place is very remote, and many a day will elapse before the news spreads to any of your other centres of activity, so long as you keep out of the law courts. Not so with us in the country. Most of our eggs are in one basket, and to drop that means losing our market altogether.

Yet another difference—in the main wholesome to us “rustics,” as we have been termed by you Londoners. Not only are we in touch with our work while it is in progress, but we have to live with it for ever afterwards. You Londoners may go down into the country and deliver yourselves of an abortion and forget all about it, but for us—Day after day we see our work; and day after day, as we turn the corner, we writhe afresh at our failures, or buoy ourselves up with the hope that the world will endorse our own secret opinion about our successes. It is no good; we cannot get away from our work; no ingenuity in the choice of routes is of any avail; there the buildings are, and to get from one place to another they have to be passed. But if rightly regarded this is a wholesome discipline; and the casual remarks of a stranger, or the criticisms of a reliable architectural friend, may be profitably stored up, like the sunshine and the rain which go to make the fruit in due season.

Living with one's work is indeed a wholesome discipline, and one is often tempted to wish in the interests of art (though not perhaps of the artificers) that some of our painters and sculptors had to live with the works which they send to the Academy. If this be the case with regard to our brother artists, whose productions can, as a last resource, be removed from sight, how much more so is it with us architects, whose designs are part of the structure itself?

If we architects were more accustomed to live with our own conceptions, I imagine there would be fewer of those picturesque features which we are so ready to bestow upon our clients. There is no better corrective of the wayward fancy than to live in a house of one's own design, and to bring to the sharp practical test of daily use all one's little fads of plan and decoration—the ingle-nooks and serving-hatches, and pretty grates and lead-light windows and stone mullions and panelled walls, and the hundred-and-one things that involve responsibility. I would not be thought to condemn the matters mentioned by any means, but I say that to live with the creations of our own fancy sobers the judgment and steadies the hand. And, therefore, we dwellers in the country find ourselves subjected to a wholesome discipline in living amid our work.

But have you any idea of what it is to live amid your clients? To meet them on the tennis-ground and the golf-links; to see them in the club, and hear them speak at public

meetings; to work with them or against them in the innumerable schemes that fill the leisure of dwellers in country towns? Do you know what it is to oppose one at a local election, to buy your hat of another, and to send back to a third the joint of meat that he has not cut to your liking? To us our clients are ordinary human beings, with a hundred objects in life, not gifts of Providence endowed with the sole desire of having a house built. We generally know something of their character in relation to other matters than building, and are able from the outset to form an opinion as to their likes and dislikes.

Another peculiarity of a country practice, which has its whimsical aspect, is the chameleon-like character of the people one has to deal with. A builder to whom you issue instructions from day to day, which he disputes at his peril, will once a fortnight sit in judgment on your plans at the local board; a foreman-bricklayer at one job will be on the building committee of another; the carpenter who makes the round of the building with you in the morning will sit at your side in the evening as your colleague in a debating society. And these contrasts of relationship are not isolated incidents, but are of constant occurrence. And far from being strange or embarrassing, they engender a mutual knowledge and respect which are of very great assistance in getting work well done.

But it is not only to the town itself that our attention has to be confined. Many a journey has to be taken into the country. Not a scramble for an express train, a tedious journey, and then a drive through country of which we know nothing, nor even the points of the compass, or what places lie on our left or our right. No, but leisurely drives through country which we get to know better month by month, and with the chance of choosing a suitable day for the work. We see the same scenes under every condition, with the early or the late sun, or under the steady blaze of midday. Sometimes we see them in a clear and brilliant atmosphere, like that of Logic and Science, when the distant and the near seem equally easy of access. And then, again, we see them veiled in a delicate mist, which, like Poetry, lends distance and proportion. The valley that at one visit ripples as the breeze touches the silvery hay, at others will ripple, perhaps, with the broad waters of a flood, or lie shrouded in the monotonous mantle of the snow. At one time the way will be cheered by the bending bunches of the lilac; at another the road will take you near the delicate and delicious odours of a field of beans. Still later in the year the bright red admiral will flutter past and sun himself on the stones, while in the winter the attention is concentrated upon the course of action to be pursued if the horse should actually fulfil his frequent threats of slipping down. And so in our constant drives we get to know the landscape in all its moods, and every view becomes more valuable as our experience of its varying aspects increases.

I am induced to dwell thus on matters which are not actually architecture for two reasons, partly because I am anxious to convey to you some idea, if only a faint one, of the pleasures that attend a country practice, and partly because a constant observation of natural scenery has a very considerable effect on the temperament and tends to develop that habit of thought which helps us not only to satisfy the necessities of those for whom we design, but also to marshal the arrangements with which we endeavour to satisfy those necessities in such a manner as to express certain ideas, such as stateliness for the rich, and quiet unpretentious comfort for the well-to-do and homely, repose for quiet surroundings or aspiring vigour for hilly regions.

There is a very great deal to be said for giving a man a house suitable to his character, for adapting the design to his habits of life rather than inviting him to change his habits to suit your design. You may give him high-art fittings, and papers, and hall-floors and all such accessories; but there comes a time when your help is no longer required, when, in the natural course of things, you relinquish control over the building, and then, left to himself, he will be sure to sin grossly in respect of carpets, and furniture, and pictures, and knick-knacks and all the trumpery ornaments which the "stores" supply. And all this flood of barbaric splendour will submerge the features which sealed the triumph of your patience and rhetoric and sarcasm.

And there is a very great deal to be said for making buildings suitable to their locality. Tile-hung walls in London are as incongruous as a prim suburban villa in the open country. A villa in the country may be required of the same capacity and at the same cost as one near a large town, but assuredly it ought not to be of the same appearance. Half the charm of the best work arises from its spontaneity, and from the entire absence of any apparent effort. As you look at it you do not admire this or that feature as a *tour de force*, but rather regard it as inevitable under the circumstances.

But it is not only from nature that we can obtain delight as we drive in pursuit of a country practice. Very few are the villages that have not some relic of ancient days, upon which we can gaze with renewed pleasure at every visit; and not only

with renewed pleasure but with increasing knowledge. There is no building that I ever knew, no matter how intimately, from which it has not been possible to gather something fresh with every visit, particularly if accompanied by a friend of congenial pursuits. Different eyes look in such different ways that, even if no new feature is discovered, there is sure to be some new aspect to reckon with. And so these old friends have an ever-abiding interest. Like Cleopatra,

Age cannot wither them, nor custom stale
Their infinite variety.

And the advantage of a country practice is that these things come in our way in the pursuit of our ordinary vocation, without any special effort, and we get to know them as incidental to the general arrangement of things, and not as sacred objects of special pilgrimages.

But while some of the pleasure of a country practice proceeds from the scenes in which it is pursued, not a little of it arises from the variety of work which it entails. The interest never flags. Now it is a church, next week a school, perhaps in the town, or perhaps in a village. Before these are digested comes an infectious hospital or an infirmary. The scene may then change to a factory or a public-hall, which in its turn may be followed by a suite of offices, a shop front or some swimming-baths. A club, an hotel and a chapel extend the list, which is interspersed here and there with houses large and small. Not the least pleasant task is to deal with farm-buildings, where sights and sounds and smells are all eloquent of country life. The mind is therefore always occupied with endeavouring to become acquainted with fresh requirements. From the courtly parson to the bluff publican, or from the far-sighted manufacturer, careful of every penny, to the well-bred master of the hounds, whose chief desire is to have his house enlarged in strict harmony with the ancient portions—these are changes which any week, almost any day, may see. No doubt in London and other large towns you get some variety, but I cannot think that you, who are more or less specialists, can have such a wide and ever-shifting range as we who live in the country, and are compelled in the nature of things to take the work that falls in our way.

That is one of the governing factors of our life, that we must take what falls in our way, and so it comes that we "rustics" look on with some amusement at the controversies which shake you Londoners to the centre. "Architecture, a profession or an art?" What in the world does it matter which view people take? Let us do the work that comes to our hand with all our might, not waste our time on disputes of nomenclature. Do you suppose we who live in the country are going to set up some fanciful standard of kind—not of excellence, mind you—and tell our clients, "This is a factory, and therefore not architecture," or "That is a shop-front, that presents no scope for art, and therefore we are much obliged, but will you kindly go elsewhere?" Do you think we can afford to earn a reputation for eccentricity like that? Or do you suppose that it is any more possible for us to decline to survey some land, or give an opinion as to the price of building sites, or lay out a building estate when called upon to do so? Who is to do it if we do not? Architects who earn their living earn it through their clients obviously, and if they gain a reputation for wanting to make puzzling selections from the work that comes in their way, they may say good-bye to clients of all kinds, and where, then, will be the architecture pure and simple upon which they are to concentrate their cultivated intelligence?

A rich man might possibly afford to be eccentric, but under the conditions which govern country life I doubt whether even he would be anything but a negligible quantity. But the man who lives by his calling must, in the very nature of the case, satisfy the conditions which govern his calling in the place where it is pursued.

We may be told, as in fact we have been told, that this is all quite right, but it is incompatible with good architecture. "The proof of the pudding is in the eating." I do not believe it is incompatible where there is previous good training and enthusiasm for the work. That is what is wanted—enthusiasm, and a fixed determination to do the best possible: to face difficulties, to master the essential conditions, to acknowledge shortcomings frankly (at any rate to yourselves), and to resolve not to commit them in future. To spare no pains, either on the drawings or on the building, but to go at it again and again till you get the thing right.

It is here in this Association that I see "the hope of English architecture." Far from saying to you "Refuse surveying!" "Refuse to take out quantities or lay out estates!" I say, "Render yourselves competent to do these things. Do not imbibe the idea that from London only is good architecture to be bestowed upon England, but go out if you can into the fine free life of the country; carry into innumerable centres of activity the enthusiasm which you gain here by contact with other young and eager minds, so that the whole country may be leavened with the nobler aims, the greater culture, the more

refined taste which you acquire here." To do this effectually you must be ready to be a surveyor as well as an architect; but you have great names in the past to keep you company—John Thorpe and Inigo Jones and Christopher Wren. But if your names, like theirs, are to live, remember this, that though surveying is an essential part of your life duties, it is, after all, in your architecture alone that you can achieve immortality. Yet it is not given to all to live for ever on the tongues of men. How small is the number of ancient buildings that we can trace to their actual designers. And, after all, how small is the importance of a man's name in comparison with the quality of his work. And, therefore, if we dare not aspire to immortality, let us take comfort from this—that though our brows may never bear the fadeless laurel, nor Time inscribe us on the everlasting roll of Fame, no one can deprive us against our will of the consciousness of having done our work to the very best of our ability.

A discussion ensued in which Messrs. Pratt, F. W. Marks, Brodie, Greenop, A. C. Stockdale, Max Clarke, Walter Blackwell, Yates and Bolton took part. A vote of thanks, proposed by Mr. Pratt and seconded by Mr. Marks, was passed by acclamation to Mr. Gotch.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

THE DEDICATION OF CHURCHES.

THE subject of dedication may appear to relate to ceremonies rather than to building, but an essay by the late John Gage upon it contains so much curious information about churches it deserves to be recorded. In a communication to "The Travelled Thane, Athenian Aberdeen," he wrote:—

The dedication of churches had its beginning under the old law, and was observed by the holy Fathers in the new: whence the Synods both of St. Patrick and of Calcuith enjoined that no priest should offer up sacrifice in any church to be built, unless the bishop of the diocese first came and hallowed it.

Gregory the Great, in his instructions to St. Augustine, bade him not destroy the Pagan temples, but the idols within them; directing the precinct to be purified with holy water, altars to be raised, and sacred relics deposited; and because the English were accustomed to indulge in feasts to their gods, the prudent Pontiff ordained the day of dedication, or the day of the nativity of the Saint in whose honour the church should be dedicated, a festival, when the people might have an opportunity of assembling, as before, in green bowers round their favourite edifice, and enjoy something of former festivity. This was the origin of our country wakes, rush bearings and church ales.

That it was the early practice in the West, in imitation of the Eastern custom introduced by Constantine, to invite many prelates to assist at the dedication of a church, may be collected from the canons of the first Council of Orange, held in 441, and of the second and fourth Councils of Arles, held in 452 and 524; and among the English this solemnity was celebrated with the greatest pomp.

St. Wilfrid, Archbishop of York, having built a church at Ripon, of wrought stone, with columns and porticoes or aisles, had a solemn dedication, which was attended by Egfrid, king of Northumbria, and his brother Ælwin, with the abbats and ealdormen of the kingdom. The church was dedicated in honour of the Prince of the Apostles, and the Archbishop consecrated the altar, and having covered it with purple and gold, all the people came and received communion, and everything was canonically performed. From the altar Wilfrid enumerated the lands with which the church was endowed by consent of bishops and princes, and pointed out to the assembly the sacred places in different districts from which the British clergy had been driven by his countrymen. The kings feasted the people on the occasion for three days; and St. Wilfrid, for the good of his soul, presented to the church a copy of the Gospels written in gold on purple leaves, and cased with the purest gold and precious stones.

To the dedication of the church of Winchelcumbe, Kenulf, king of Mercia, brought with him Eadbert, the captive king of Kent; and there were present Cuthred, the titular king, thirteen bishops and ten ealdormen, beside an immense concourse of people. At the conclusion of the ceremony Kenulf led his captive to the altar, and as an act of clemency, granted him his freedom. This was followed by a royal distribution of presents, consisting of vessels of gold and silver, and garments, and the fleetest horses; to such as had no lands the king gave a pound of silver; to each priest a mark of gold; to every monk a shilling; and much was given to the people.

At Ramsey a conventual church had been founded by the ealdorman, or half king, Aylwin, in 969, under the direction

of St. Oswald, then Bishop of Worcester. It is described by the Monk of Ramsey to have been raised on a solid foundation, driven in by the battering-ram, and to have had two towers above the roof; the lesser was in front, at the west end; the greater, at the intersection of the four parts of the building, rested on four columns, connected together by arches carried from one to the other. The historian, who wrote after the coming into England of the Normans, remarks that the edifice was handsome enough for that mode of construction which was in use at that early time. In consequence, however, of a settlement in the centre tower, which threatened ruin to the rest of the building, it became necessary, shortly after the church was finished, to take down the whole and rebuild it. To the dedication of this second church at Ramsey, St. Oswald, who was become Metropolitan of York, invited all the thanes of the six neighbouring counties, and they were joined by Æscwin, bishop of the diocese, Æselm, Bishop of Dorchester, and the Abbots of Ely, St. Albans, Burgh, and Thorney. Before the ceremony began, all the assembly forming a ring, Aylwin, the founder of the church, from the midst of the people, read to them the charter of privileges granted to the monastery by King Edgar, and he conjured those present to gainsay, if they could, the title of the monks to their lands. As no one came forward, "I call then on you all," continued the ealdorman, "to bear witness before God that on this day we have offered justice to every adversary, and that no one has dared to dispute our right. Will you, after this, permit any new claim to be preferred against us?" Then, placing his right hand on a copy of the Gospels, Aylwin swore to defend the rights and privileges, as well of Ramsey as of other neighbouring churches which were named; after which his sons, and others in turn according to their rank, took the same oath, and, the book being laid on the altar, the abbots present received each of their defenders into the fraternity of their respective monasteries. The ceremony of dedication, which followed, lasted until a late hour of the day, and was closed with a solemn feast.

Wulstan, the monk, has left us a poem on the dedication of the cathedral church at Winchester, restored or rebuilt by St. Æthelwold. The dedication was honoured by the presence of King Ethelred and nine prelates, including the Archbishop St. Dunstan and the Diocesan St. Æthelwold. The description which the poet gives of the church and monastery is too long to be detailed here, but deserves the attention of the ecclesiastical antiquary; and such was the splendour of the dedication of this church that Wulstan says:—

*"Nunquam tanta fuit talisque dicatio templi
In tota Anglorum gente patrata reor;
Qualis erat Venta celebrata potenter in urbe
In Sancti Petri Cœnobio veteri."*

The last act of the reign of Edward the Confessor was a solemn festival proclaimed throughout the realm on the occasion of the dedication of the church at Westminster, and the king being on his death-bed at the time, the queen officiated for him, in the presence of all the nobles and bishops of the realm.

These examples of the pomp of the English in their church dedications will abundantly suffice, and the form of the ceremonial may be seen in their rituals. It appears from the pontifical which bears the name of Egbert, Archbishop of York, and the Missale Gellonense, that there was a particular form of notice or invitation given previously to a dedication; and the Church of England in her present order of consecration of churches preserves this custom, for the canons require that an intimation of the bishop's intention to consecrate the church, with the day and hour appointed for it, should be fixed on the church door at least three days before. We have also a verification of the acts of our Anglo-Saxon ancestors at the consecration of their churches in the present ecclesiastical canons of this country, which enjoin that the endowment and the evidence of the church to be consecrated should be laid before the bishop, or his chancellor, some time before the day appointed, in order to the preparing of the act or sentence of consecration against that day; that all things should be prepared for a communion, and the church be kept shut and empty till the bishop's coming, and till its being opened for his going in.

Perhaps one of the earliest forms of dedication which the Anglo-Saxon manuscripts afford is to be met with in a pontifical, now in the public library at Rouen, formerly belonging to the Abbey of Jumièges. According to this ritual the following order was observed.

The bishop in his pontificals, with the clergy, came at break of day to the porch of the church about to be dedicated, singing the antiphon, "Zaccheus, make haste, and come down;" and twelve candles being lighted and placed round the outside of the church, the litany commenced, which was chanted by the clergy and the people in alternate choirs as they moved thrice in solemn procession round the building.

Then one of the deacons going into the church, and shutting the door after him, while the rest remained without, the bishop going up to the door began the antiphon, "Lift up your gates,

O ye princes, and be ye lifted up, O eternal gates, and the King of Glory shall enter in." Whereupon all went in procession round the church, singing the twenty-fourth psalm, until they came again to the porch, when the bishop knocking at the door of the church thrice with his crozier, repeated the same antiphon. This ceremony was observed a second and a third time, the deacon within the church each time, as the bishop gave out the antiphon, "Lift up your gates," replying, "Who is the King of Glory?" After the third response the choir sung, "The Lord of Hosts, He is the King of Glory," and immediately the deacon opened the door.

The bishop now entered the church, crying, "Peace to this house and all who dwell in it; peace to those who enter, peace to those who go out;" and singing the eighty-seventh psalm, they proceeded up the church to the foot of the high altar, and lay prostrate on mats before it, while a short litany was chanted. At its conclusion they rose, and the bishop, with the end of his crozier, wrote two Roman alphabets on the floor, in the form of a cross, extending from the eastern to the western corners of the building.

Next came the blessing of water mixed with salt, ashes, wine and chrism, and the bishop putting some of the liquid upon lime, made mortar for closing up the relics to be deposited in the altar. This was followed by the purification of the different parts of the edifice and the precinct, which were severally sprinkled in order with the holy water.

The bishop, now standing in the middle of the church, dedicated it in formal words, and then sung the preface to the consecration, and going up to the altar proceeded to consecrate the altar stone, and afterward the walls of the church, anointing the same with chrism, in the form of a cross, in various parts.

Then the altar linen, vestments, corporal, paten, chalice, eucharistic vessels, censer, and other things necessary for divine service were brought in order by the sub-deacons and acolyths to be severally blessed; after which the bishop hallowed the cross, the bells and the font, and consecrated the cemetery.

They then went to the place where the people in prayer watched the relics which had been brought the night before for the occasion, and the litany being said, the clergy raising the shrine and singing canticles, carried it in full procession with crosses, censers, candlesticks, and many lights to the church. The shrine was placed upon the new altar, and the veil being drawn between the clergy and the people, the bishop with his own hand deposited, according to the Roman custom, the relics in the confessional or stone sepulchre of the altar, anointing the confessional with chrism; three particles of the eucharist and three grains of incense were then added and the whole closed up with mortar.

The bishop and clergy, now retiring to the sacristy, put on other vestments, and in the meantime the altar was dressed and the church adorned and lighted up and a solemn mass concluded the ceremony.

It may be added that it was the ancient practice for the bishop to deliver a discourse on the occasion, and the "Sermo de Dedicatione," beginning, "Natalem templi hujus," ascribed to St. Cæsarius of Arles, is to be found in another part of the pontifical of which we are now treating.

The length of the ceremony necessarily occupied many hours; and, unless the diocesan had been assisted by other bishops, it would have been impossible for him to perform the whole of it in one day. Bishops, therefore, came not merely as witnesses, but as coadjutors; and, where a variety of things were required to be consecrated, different offices were going on at the same time in various parts of the church.

The bringing of relics to a church about to be dedicated on the evening preceding the ceremony was the occasion of a vigil or wake; that is to say, the night was spent in watching, fasting and prayer. Chaucer uses wake in this sense:—

Aaron, that had the temple in governance,
And eke the other preestes everich on,
Into the temple whan they shulden gon
To praien for the peple, and do servise,
They nolden drinken in no maner wise
No drinke, which that might hem dronken make,
But ther in abstinence pray and wake,
Lest they that deiden—

The Sompnoures Tule.

Succeeding ages used the term wake to signify the feast which was annually kept to commemorate the dedication, on which occasion the young and old were wont to meet at break of day shouting "Holy wakes, holy wakes." The ecclesiastical laws of King Edgar are particularly directed to prevent excesses at these meetings, and to maintain the religious observance of them.

St. Ambrose, writing to his sister Marcellina on the occasion of the dedication of the new basilica at Milan, tells her, "Nam cum ego basilicam dedicassem, multi tamquam uno ore interpellare cœperunt dicentes: sicut Romanam basilicam dedices? respondi: faciam si martyrum reliquias invenero." Epist. xxii.);

whence it has been inferred that the deposition of relics at the dedication of a church was at first peculiar to the Roman ritual. This deposition of relics was prescribed to the English by Gregory the Great; and the usage of it, as well as the ancient Roman custom of enclosing in the altar with the relics three particles of the eucharist, is confirmed by the canons of the Council or Synod of Calcuith, held in 816.

In some instances scrolls were added, according to the directions in the Roman pontifical, intimating what relics were deposited, and to what saint the church was dedicated, and the name of the consecrator, and the year, month and day of the consecration: sometimes these scrolls contained the Decalogue, or a capitulary of the Gospels. It may also be observed that the National Council last noticed required every bishop dedicating a church to see that on the walls or altars of the church there should be painted the saint to whom they were respectively dedicated, a strong proof, if any were required, that there was no want among the Anglo-Saxons of native painters.

Gregory the Great, beside relics, also ordered hyssop to be used in our church dedications; and Bede relates, that St. John of Beverley having been sent for by Erle Puch, whose wife was dangerously ill at the time, to consecrate a church, miraculously healed the lady by means of some of the holy water that he sent her, which the saint had hallowed in the dedication of the church.

The ancient altar stone, known by the crosses graven in the centre and at the angles, is now frequently to be found in our churches, generally applied to sepulchral purposes. The crosses upon it were intended to mark the spots anointed with chrism; and, if I do not mistake, this was the object of the crosses once inlaid with metal, cut in the external walls of some churches, as in the cathedral of Salisbury and the churches of Edindon in Wilts, Cannington in Somersetshire, and Brent Pelham in Herts. It may also be observed that on one of the Norman pillars in New Shoreham Church are two Jerusalem crosses, probably graven on the occasion of the dedication.

Those who wish to understand the meaning of any of the mystical ceremonies, such as the lighting of the twelve candles, and placing them round the church, the writing of the alphabet by the bishop with his crozier, in ashes spread on the pavement, and the like, may consult a tract, *De Dedicatione Ecclesie*, ascribed to Remigius, Monk of Auxerre.

During the time the bishop was depositing the relics in the altar, the veil, out of reverence, was drawn, *extenso velo inter eos et populum*. The veil here spoken of was the curtain that anciently hung on the cancelli or lattice of the choir, and which was drawn during the more solemn parts of the service.

The author of the apostolic constitutions, perhaps the earliest ecclesiastical writer who describes the shape of a Christian church, tells us that it resembled not only a ship but a fold, "non solum navis, sed etiam mandræ habet ecclesia similitudinem;" and he explains its resemblance to a fold by showing that the clergy were separated from the laity, and that the laity themselves, according to sex, age and rank, had separate enclosures, under the care of different persons. From Eusebius we learn that the choir of the apostles, built by Constantine at Constantinople, was enclosed by a lattice of brass and gold, and that the choir of the church at Tyre was separated from the people by a lattice of wood beautifully wrought; and it appears from passages in St. Dyonisius, St. John Chrysostom, Theodoret and others, that there were curtains to the chancels. Lattices with curtains continue to be the custom of the Greek church; and though curtains have ceased to be used in the Latin church, Durand, Bishop of Mende in the latter years of the thirteenth century, says that in his time there was commonly a veil, or a wall, between the clergy and the people.

THE TRAINING OF INDUSTRIAL DESIGNERS.

TO the late Benjamin R. Haydon the credit must be attributed for being the first who in this century pointed out the necessity of a training of a high class for all who were concerned in industrial designs. The following paper, which he wrote half a century ago, it will be seen in many respects corresponds with the latest experience on the subject:—

Schools of Design.

In the Somerset House Drawing Book, No. 1, it is laid down:—1st. That ornamental art, as an imitative art, ranks midway between fine art and mechanical art, and partakes of the nature of both. 2nd. That the fine arts, in dealing with poetry, history and moral expression, occupy a ground in which the ornamentist has no right to enter. And yet, thirdly, that on beauty the artist and ornamentist occupy the same ground.

Again, the author says the power of imitating objects artistically is not adequate to the ends the ornamentist has in view, and yet at page 3 the author says, "It is not merely with lines the ornamentist has to do, he has often to represent the colour and effect of metallic substances, the glitter of gems, in short, to make a picture of the article manufactured, which shall

show its general character and appearance rather than the exact details of its form and ornament, and there is no other way of acquiring the power of doing this than by the habit of copying, as an artist, the objects themselves or similar ones."

Again he says, the ornamentist arrives at practice through science—the artist to science through practice.

And yet he says in the same page, "A saving of time would be effected, if the chief labour at commencement were bestowed (by the ornamentist) on drawing by the hand."

In reply to these inconsistencies I beg leave to state that—

1. The ornamentist and the artist both express their thoughts and inventions by the mechanical operation of imitating natural objects by form, colour, and light and shadow. Imitation of natural objects is, therefore, the basis of both ornamental art and high art, and the easiest plan of practising the eye to see, the brain to conclude, and the hand to obey, is the best plan at the beginning, both for ornamentist and artist.

A student may puzzle his memory so long by scientific distinctions, if he begin by science, as to find when he has acquired science his hand perfectly helpless; and therefore, both in the case of the ornamentist and artist, a certain degree of purblind practice of hand, eye and brain is absolutely necessary for the highest genius in each department, as well as the humblest, so that when their minds comprehend any principle of science, or any object of nature, their hands may at once be able to illustrate them by design.

No artist of the Greek and Italian schools was considered a great artist without science, and no ornamentist was considered a great ornamentist unless he was a great artist too. Raphael was a great ornamentist; Giovanni d'Udine and Cellini were artists as well as ornamentists, and the foundation of both characters is, first, a power of imitating what you see.

There is no doubt the imitation of senseless angles and cones and octagons and pentagons may generate a dead sort of mechanical imitation, but the mind of the mechanic and artist sleeps, because there is nothing whatever to interest their sensibilities in the progress. Give them beautiful eyes their sympathies are excited, and the circle and ellipsis being portions in the shape of eyes, they acquire the same power of imitation, and exercise their powers of thinking too; follow eyes by the nose; they learn the perpendicular; let them then practice the mouth; they are obliged to make it horizontal or at right angles with the perpendicular of the nose. The shape of the head is an ellipse, the forehead and chin portions of the circle.

A human head is thus got through, combined with a human look and a human expression. The students feel as they proceed. What practice for geometrical designs is left out in the figure? Then come action, repose, intention and thought by circles, ellipses, angles and perpendiculars, but combined as a whole to convey a meaning. When the artist and mechanic are got thus far show them, if you please, where is the geometry of the head and figure, practise them in angles and circles, that they may know their meaning; make them both men of science, if you like, and let the mechanic begin to branch off; but begin with making both skilful in hand, eye and brain by imitating the same object, for, according to our author at Somerset House, "a saving of time would then be engendered, if the chief labour at first were drawing by the hand."

If the power of imitation be the first power to be acquired, as I have proved, both from what I have said and what our opponent says, why separate the education of artist and mechanic? But what will you say, or he say, when he acknowledges that in the most important of all qualities of design, viz. beauty, the artist and mechanic stand on the same ground, and yet he would separate their education? And though he admits they stand on the same ground, yet he again says they proceed to exhibit beauty by a method totally the reverse to each other.

"Beauty," says he, "with the ornamentist is a quality separable from natural objects." I reply it cannot be. Beauty with the ornamentist, from whatever form taken and applied, excites the emotion in the work of the ornamentist, not because it is separated from the object to which it naturally belongs, but because to whatever object applied it has the power of again exciting the emotion, as it did when a component part of its natural object at first.

If a sculptor, says he, makes a lily, he models a lily. "Not so the ornamentist; the lily appears in his hands with a new individuality." Of course; but it is still a lily. The ornamentist makes it a cup, a vase; but I reply it is still a lily turned into a vase and cup, and if it be not like a lily, what would a sensible master say to a mechanic who showed him a cup made of a lily? "A lily! it is not a bit like a lily. Pray did you model a lily, or draw a lily?" "No, sir, I did not, because we ornamentists treat lilies with a new individuality." Very true, my pupil, but to be able to give a new individuality to a lily you must first be able to form a lily in clay, or by drawing; to model or draw a lily you must get a lily and study it; after studying it you must imitate it by modelling or drawing. Imitation is the foundation of all arts or design, whether

for the artist or ornamentist, and though the ornamentist turns a lily into a new office, if he cannot imitate a lily or a human figure, somebody else must be employed to do them for him, and this must prove to you, my pupil, the necessity of the ornamentist and the artist beginning alike. Because what applies to the lily will apply to the figure, and the arguments are as good in one case as the other, and both prove the same truth.

The author proceeds to say "that the ornamentist and the artist are imitators of nature, but in different senses—in the one the resemblance is fictitious, in the other a reality." I reply the resemblance in both is fictitious, and in both a reality, though the application is different.

The basis of all this sophistry is simply this: the London leading artists had been so accustomed to be by their rank, their payment, their honour, and their privilege, a distinct class, that they were shocked by any attempt to revive the old connection between artist and artisan. It was a sculptor, though rising from humble but respectable parents, who first intimated the insult of giving the artisan an education which would rank him more as an artist than, for 300 years, he had hitherto been in England, and, of course, without any imputation on the honourable motives of any one now; we all know there is a degree of sensibility as to duty, in defending the views of our superiors, if to them we owe our station and our existence in life—it is right it should be so, perhaps I do not know if one is not inclined to respect gratitude, if even it lead a man into the most egregious folly.

It is a question if the education of the mechanic be not of more importance than the great artist's. See how he worms himself into all the ramifications of domestic decoration, and consider, if he had, like the German and the Frenchman, the power of conveying his thoughts by drawing the figure, how prettily at a little cost the drawing-room of the middle-classes or their parlour or their bedroom might be made vehicles of history and poetry and design. The more the power of design is diffused the greater, and not the less, will be the employment of the great painters. The wealthy and the noble will always have the best of everything, and they who love the handsomest women, drink the best wines, ride the best horses, and claim the highest stations will not be very apt to desert the best artists when they want their efforts. I am decidedly of Burke's opinion. "Whatever turns attention to art, even the purchase of old pictures," said he, "reflects again on modern painters."

Never, I assure you, was British art in greater danger than now. This London school, by separating the artist and the mechanic and promulgating the doctrine that sound art and decorative art are distinct, will in all probability do more mischief than a century will remedy: because the facility of admission is great, young artists go to it, and all the horrors of gaudiness, glare, hardness and false taste will spread like wildfire amongst the rising generation.

What reason can be given that a flower should look in decoration like botanical preparations pasted flat on lime? Distinctness is necessary, of course, but why cannot imitations of nature be distinct without being inconsistent with the eternal principles of the great masters established by the greatest geniuses the world ever saw?

Titian, Velasquez, Rubens, Rembrandt and Reynolds made their imitations of nature on the basis of the philosophy of human sensations.

Equalities of effect distract: variety is necessary, but if carried too far pains. It is the same with every quality of imitation in the great works of the great masters, no individual requisite of imitating life is ever obtruded, whereas by the separation of the education of the artist and the mechanic, the imitations of the mechanic at present are all obtrusion and totally inconsistent with sound art. If a race of this offensive description issue out as designers for glass-paintings for rooms, for halls, what will the art be like in a few years? The combination of sound art can be seen to perfection in a glass window at Liverpool, where a fine picture has been copied with all the principles of imitation; it is a fine work of art in manufacture, and that is what should be the object in all schools of design.

Not long since, returning from Windsor, I went into the coffee-room of the Royal Hotel, at Slough, and found the paper on the walls full of pretty designs, from Faust (I believe). "Is this English?" said I. "English," said the waiter, with an air quite insufferable, "French, sir, of course!" Here is another case in point. Had the same principles of educating the mechanic been acted on at Lyons as in London, would this French artisan have been able so to please us in the middle class by such a display, and is not every visitor excited and improved by such a simple way of recalling the scenes of some beautiful poems?

I apologise for this long intrusion; my engagements preclude the possibility of continuing this important question, but I promise it shall not rest whilst I live, for I know its vast national importance, and that we have only to add mastery to design to our indisputable quality of material, to take the lead in the world.

In conclusion, I deny in toto that the mechanic has no

right to mingle history, poetry and moral expression in his manufacturing design; what right has any man or any body of men to fix a limit to the exercise of human ingenuity? The Almighty sometimes gifts a Byron, and sometimes a Burns, and reflects on the principles of our own noble aristocracy. Who more tenacious of their rights, but who more useful as a check on the Crown and the people? and who is refused admission into their class, even from the humblest amongst us, if genius, guided by conduct and decorum, prove any individual worthy to be a great lawyer, soldier, sailor or statesman? If it were not for this wise decision, what would have become of the aristocracy long ago? and with such an aristocracy in government, are we to establish one in art, where no genius, no decorum and no conduct will procure elevation and reward for the humble mechanic? Ridiculous—the bare thought and promulgation will make us the laughter of Europe, if this preface has not done so long since.

The artists must become workmen and the workmen more artists, before the great revolution, beginning will begin aright; but it will not be by putting forth theories which will separate them more and more than ever, but by being convinced, as the great continental schools have long been, that as imitation is the basis of both arts, the students in each should begin alike.

At the revival of art in Tuscany artists were artificers and artificers were artists in the strictest sense of the words. "It was not in the academy but in the workshop their genius was nurtured—the *arte degli orefici*." "The goldsmith's craft was the chiefest school; hence came the best artists of all the three arts of architecture, painting, sculpture—Brunelleschi, Ghiberti, Orcagna, Luca della Robbia, Massolino, Ghirlandaio, Pollajuolo, Botticelli, Verrochio, Francia, Finiguerra, Andrea del Sarto, Baccio Bandinelli, Cellini, Salviati, Lioni, Vasari, and a host of inferior names, all were brought up to this good trade. Painters were chiefly employed as decorators of houses and furniture, &c." In all the associations of artists, trunkmakers, varnishers, saddlers, cutlers and all workmen in wood or metal whose crafts had any connection with design were admitted; and yet in England they are to be separated in education.

I think, therefore, that there is nothing "very erroneous in saying that the power of imitating natural objects artistically ought to be the first requisite in the education of the ornamentist, or that the artistic imitation ought to begin by the human figure, since the mastery of this would render every other attainment comparatively easy."

To conclude, the error of the first council of the London School of Design was this, viz. adopting the German instead of the French principle in educating the mechanic. The French begin by the figure and sound art—and the artisan thus educated carries sound art to ornament. The Germans begin by ornament and make the figure and sound art the second step—and the Germans never recover the false taste of their education.

It is not yet too late to remedy this great mistake, by passing a law in the council that every mechanic, as at Lyons, should be obliged to begin by the figure; and if this be not passed, I predict a corruption of taste in artisan and artist which will throw the art into hideous confusion for years.

ARE FINAL CERTIFICATES BINDING ON CLIENTS?

THE case *Cunliffe v. Hampton Wick Local Board* came again before the Courts on Tuesday, when judgment was given in the Queen's Bench Division by Lord Coleridge and Lord Justice Lopes. According to the *Times* report, it was an action by a contractor against the board to recover an alleged balance on a contract to construct new sewers for the district, they counter-claiming for 900*l.* for the cost of reconstruction of a part of the sewers; and the official referee having found in favour of the board on that counter-claim, he now appealed against the referee's report. The contract, on August 14, 1889, was that, in consideration of the sum of 5,523*l.*, the contractor agreed with the local board to do the works in the construction of the main sewers, branch sewers, &c., in accordance with the specification and under the superintendence and to the satisfaction of the surveyor, and subject to certain conditions—(1) he was to provide everything requisite for the due execution of the works in the specification; (2) to conform to the regulations of the local authorities; (3) to amend any errors in the works on the requisition of the surveyor and on request to provide what is necessary and to provide all materials which may be necessary for the works, all materials and workmanship to be of the best possible kind; (6) the contractor not to vary or deviate from the specification or execute any extra work unless required by regulations or unless upon the authority of the surveyor by order in writing; (7) any authority given by the surveyor for any alteration or addition in the works is not to vitiate the contract, but, unless the price should be agreed upon, to be measured and valued and certified by the surveyor; (10) should any of the works be, in the opinion of the surveyor, "executed

with improper materials or defective workmanship the contractor is, when required by the surveyor during the progress of the works, forthwith to execute the same, and in case of default the surveyor to have power to employ other persons to do it, and the cost is to be borne by the contractor; (11) any defects and other faults which may appear within three months from the completion of the works, including any additional or extra works authorised by the surveyor under (6) and arising out of defective or improper materials or workmanship, are, on the direction of the surveyor, to be made good by the contractor at his own cost; (14) the works to be completed in six months from the commencement; (16) the contractor to be entitled to receive the balance of all moneys due to him at the expiration of the period of maintenance of the works, that is, three months from the completion of the works; (17) the certificate of the surveyor showing the final balance due to be conclusive evidence of the works having been completed. Such being the nature of the contract, it appeared that, though the land is very far below the level of the river—and the soil is wet and sandy and unstable—the specification did not in terms provide that the pipes should be laid on concrete, and, in fact, the contractor did not so lay them; and though it was required that there should be concrete at the "bends" or junctions, this, it appeared, according to the findings of the referee, was not fully carried out, and in the result many of the junctions gave way and pipes were broken. When the work was completed, disputes arose between the board and the contractor, which it was proposed to refer to arbitration. On April 6, 1891, however, the surveyor gave a certificate that the works under the contract and the extra works in connection with the same had been completed to his satisfaction, and that Mr. Cunliffe "was entitled to receive the balance of 637*l.*" But the board were dissatisfied with the work, and disapproved of the certificate being given, and, indeed, discharged the surveyor and appointed another. The contractor, however, relied on the certificate; and, in addition to this, the contractor made two claims for subsequent work, bringing the amount claimed to 747*l.* But in the meantime the new surveyor had required the contractor, under clause 10 of the conditions, to re-execute portions of the work. This clause related chiefly to the part of the sewers belonging to Vicarage Road, as to which the case stood thus:—The final certificate having been given on April 6, 1891, the three months given by the contract would expire on July 6. In June some stoppage was discovered, which led the surveyor to order part of the sewer to be taken up to discover the cause, which was found to be the breakage of a pipe, and he afterwards directed the whole of the Vicarage Road sewer to be opened up to discover any defects. The Vicarage Road portion was divided into three sections. The first was opened in July 1891, the second in September 1891, the third in December 1891. The surveyor then directed the whole of the Vicarage Road sewer to be taken up and re-laid with concrete and flagstones, on account of the wet and treacherous nature of the soil. In the meantime a new surveyor was appointed, and this new surveyor declared the work in the Vicarage Road and Hampton Wick Roads was badly done, and required it to be re-executed by the contractor under the 11th condition, on the ground that the work was badly done; and, on his refusal, had it done, and made a claim of 210*l.* for work done in making a good sewer in Hampton Wick Road, and 688*l.* for work done in making a good sewer in Vicarage Road. Further they claimed damages at the rate of 50*l.* a week from February 14, 1890, to April 6, 1891. The plaintiff disputed these demands, and the parties being thus at variance this action was brought on July 6, 1891, and in this action the board counter-claimed for nearly 4,000*l.*—that is, nearly 3,000*l.* for delay and 908*l.* for the cost of re-executing the works, &c. The case went to an official referee, whose first report was in October last, and a question arose as to the time from which the period of three months was to run, and the Divisional Court and Court of Appeal held that the three months were to be calculated from the date of the certificate of completion of the works, and sent back the report to him on that point, and in February last the referee made his report—that the plaintiff was entitled to recover 622*l.* 2*s.* 9*d.* on his claim; and that the board were entitled to recover from him 909*l.* 17*s.* 3*d.* on their counter claim; and so he directed judgment to be entered for them for 287*l.* 14*s.* 6*d.*, against which the contractor now appealed. The referee, in the course of the case, observed that, with reference to the nature of the soil, probably the original design was defective in not providing that the pipes should be laid in concrete, and he did not allow the board for the flagstones, as that was an improvement; but he thought that the contractor had not properly done what he was required to do as to the concrete at the junctions, and this was a defect—the cause of the mischief—for which the contractor was responsible, and that was the basis of his report.

Mr. Lankester, who (with Mr. A. Hudson) appeared for the contractor, contended that the report was wrong, and that the referee had misunderstood the contract. The eleventh condi-

tion only applied, he said, where the contractor had badly done the work, and the defects discovered had arisen from such bad work and the surveyor had overlooked it; but the surveyor under whose orders and direction he had done the work had not been called to show this, and the work, it must be presumed, was done under his orders.

Lord Coleridge, however, pointed out that by the express terms of the contract the work and materials were to be the best possible.

Lord Justice Lopes also pointed out that, according to this contention, if the surveyor passed over bad work it could not be complained of.

No; it must be admitted that the certificate is not conclusive. But then it must be proved that the work was badly done and the onus of proof is on the employers.

Lord Coleridge: The contractor is to do the work well, with the best workmanship and materials, quite independent of the approval of the surveyor.

It is subject to this that the surveyor did not approve it, but overlooked it.

Lord Justice Lopes: That view entirely destroys the condition.

It is manifest that the first surveyor had approved the work, for he gave his certificate, and he was not called to show that he had not approved or had overlooked the defects complained of. The truth is that the sewers were originally, under the sanction of the surveyor and with the knowledge of the board, or a cheap system unsuited to the "wet and treacherous nature of the soil," and the new surveyor had the sewer in question relaid on a proper, but more expensive, system, and then sought to charge the contractor with the expense, and the referee had charged the expense to the contractor, thus making him pay 900*l.* for re-executing this work in a better way. The referee, therefore, has decided on the wrong principle and on a wrong view of the contract, and his report should be set aside.

Mr. Horace Ivory appeared for the Board, and first submitted that the question was one of fact, on which the referee was in the position of a jury, and that so, his findings could not be set aside if there was any evidence on which he could so find. [The Court, however, dissented from this, and called upon him to support the findings of the referee.] He had found, as a fact, that there had been bad work in the Vicarage Road sewer. The question is not confined to the opinion of the surveyor at the time the work is done. [Lord Justice Lopes: Suppose he has died?] Just so, or has been removed. Now, as early as June 1891 the sewer was found to be stopped, and surely that was a defect which appeared within the three times. It was true that the cause, the breakage of the pipe, was not discovered until July. But the operation of taking up the sewers to discover the cause was necessarily continuous, and they had to be taken up until the cause was discovered, as it was, and it was found that there was not only one breakage, but that there was a breakage at every junction, so that there was a series of defects in the sewer which had caused the stoppage.

Lord Justice Lopes: And made it necessary to take up the whole of the sewer?

Just so.

Lord Justice Lopes: But might it not be said that these defects arose from a fault in the design?

It was said, it was urged before the referee; it was the main point taken before him, and he found that the concrete was improperly put in, and that this had caused the breakages at the junctions. The referee had found that the concrete was so put in as not to support the pipes. It was not a question of design, but of execution. It was urged that the contractor had carried out the orders he received from the surveyor. But that was not so, and the referee had expressly found the contrary. In fact clay had been put in instead of concrete, and the work was "scamped." That was the real cause of the mischief, and it was on that the referee found. The orders given were that at each "bend" or junction three barrels of concrete should be put in, whereas at most of them only a barrel and a half was put in, and the rest filled up with clay. That was the defect. It was true, as the referee said, there might be a defect in the design. But he expressly found that the mischief had not arisen from the design, but from defective material and workmanship. He had his mind directed to that very question, and he had expressly found upon it, and he had only allowed to the board the cost of remedying the defects which caused the mischief, and so he had not allowed the expense of the flagstones, as it was an improvement on the original design. The referee, therefore, was justified in his findings and in the report founded upon them.

Mr. Lankester was heard in reply. He urged that the contractor had a right to rely on the view taken by the surveyor who acted when the work was being done. [The Court, however, as before, rejected this view distinctly. Their Lordships pointed out that the contract in this as in other cases expressly provided that the contractor was to obey the directions of the surveyor "or any other surveyor" who might

be appointed. Lord Justice Lopes asked what was to be done if the surveyor first appointed died, or became incapacitated by illness. Lord Coleridge said, Suppose the board thought their surveyor too easy, and playing into the hands of the contractor, and discharged him? Then great injustice may be done by the appointment of a new surveyor who takes too strict a view. [Lord Coleridge: That is provided for by the usual arbitration clause, which applies to any "dispute or difference."] Only one breakage was found within the three months.

Lord Coleridge: But that necessitated taking up the sewer, and then it was found that at nearly every junction there was a breakage.

Lord Justice Lopes: It was probable that these breakages had occurred before, and they were certainly faults.

At the close of the arguments, which, with a brief interruption, took up all day, their Lordships pronounced judgment in favour of the board.

Lord Coleridge said the court would have been ready to send back the case again to the referee if they thought, on the ample argument it had received, there was any ground for taking that course, quite certain that he would do justice to the parties. But they did not think that it was necessary to take that course. He had thought from the first there were defects in the execution of the works, though on the first reference, in his view of the effect of the contract, the three months had elapsed. That view having been corrected by the Court and the case having been sent back to him, he had found that to a great extent the mischief had arisen from a faulty execution of the work. It was true that he had observed that the original design was defective, but he had found that the mischief had arisen from its faulty execution. The proof of that was that there was a method by which the defects in the design might have been obviated, and in some few cases this method was directed and adopted, and in those cases no mischief had resulted. But in all other cases that method had not been adopted, and the mischief had resulted; the cause being that there was no firm and proper support for the pipes. It was urged, indeed, that a large portion of the sewer had been taken up and relaid, and that it was unfair to charge the contractor with that, as the stoppage was only at a particular place. But the leakage first discovered had led to a further examination of the sewer, and a great many junctions were found broken and were restored. Now, it was a question of fact; and there was evidence on both sides, and the question was for the surveyor to decide. It was objected that this was a new surveyor; but the contract provided expressly that the contractor should follow the directions of any surveyor appointed by the board, as otherwise, as had been pointed out, great absurdities would arise. On the whole, therefore, there was no ground for sending the report back to the referee, and the appeal against it must be rejected.

Lord Justice Lopes concurred. He quite agreed as to the construction of the contract; and there was evidence on which the referee might find, as he had done, that the mischief had arisen from defects in the execution of the work, and not from the design or from the direction of the surveyor.

Appeal accordingly dismissed.

DUNDEE INSTITUTE OF ARCHITECTURE.

AT the fourth ordinary meeting of the Dundee Institute of Architecture, Science and Art, Professor Steggall delivered a lecture on "The Influence of Town Life on National Character." He argued that the depopulation of the country districts and the increase of the number of dwellers in large cities tended to the loss of individuality, of patriotism, of independence, of reverence and of judgment, and that that fact affected the national character. The balance of opinion was averse to the theory that large towns were on the whole the best. Dealing with the health aspect of the question, he said that although the influence of health on national character was indirect its action was universal. On that point they had a serious case against large towns. In Glasgow 42,000 families out of 126,000, or one-fifth of the whole, lived in single rooms; in Dundee 1,000 families, from five to nine in number each, resided in one apartment; 7,500 other families of a less number than five also lived in a single room, the total being 8,500, or nearly one-fourth of the whole. In elaborating that point and alluding to the recreations of the citizens of large cities, Professor Steggall stated that of all the forms of exercise that had been introduced within the last twenty years the bicycle had been, and was likely to prove, the most beneficial to the health of the community. At the close the lecturer was accorded the thanks of the meeting. Lately attention was drawn to the fact that the Brechin Corporation had advertised for competitive plans for proposed municipal buildings. Remarks were made to the effect that such competitions were derogatory to the profession of architects, and it was resolved to send to the advertisers a copy of the rules of the Royal Institute on the subject, and

suggest that the Brechin Town Council should conform to these rules. At the last meeting it was stated that no action had been taken by Brechin.

EDINBURGH ARCHITECTURAL ASSOCIATION

ON Saturday, the 25th inst., members of the Edinburgh Architectural Association paid a visit to Glasgow, and were shown over the municipal buildings and the cathedral. Among the party were Messrs. W. W. Robertson, president; T. Fairbairn, hon. secretary; John M'Lachlan, Balfour Paul, Thomas Ross, James Kennedy, J. M. Gray, J. Bryce Mortimer, James Bruce, W.S.; Mitchell, W.S.; and Wallace R. E. James, S.S.C. On the arrival of the party at Queen Street Station shortly after two o'clock they were met by Mr. John Honeyman, architect, Glasgow, and at once proceeded to the new municipal chambers. The company were shown over the building by the custodian, Mr. M'Leod, and before leaving, on the motion of the President, a vote of thanks was awarded the Lord Provost and magistrates for their courtesy. The cathedral was next viewed, and Mr. John Honeyman pointed out its different styles of architecture. Subsequently some of the members of the party visited the new Barony Church, designed by Messrs. Burnetson & Campbell.

THE LATE J. S. CROWTHER.

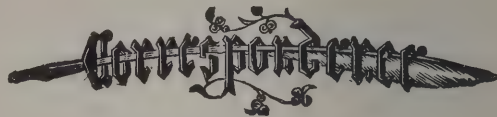
THE death is announced of Mr. Joseph Stretch Crowther. In Manchester and the neighbourhood, says the *Manchester Guardian*, Mr. Crowther was, of course, best known as an ecclesiastical architect. His first work of any importance in this department was St. Mary's Church, Moss Lane, Hulme, built by Mr. Wilbraham Egerton, of Tatton, and consecrated by Bishop Price Lee in November 1858. This church is still regarded as one of the best specimens of Gothic architecture on the south side of Manchester. In 1874 he was commissioned to design the well-known church St. Alban's, Waterloo Road, Cheetham, and, at a subsequent period, during the rectorate of Canon Knox Little, the schools of the same church. In 1875 he designed the important new church of St. Mary's, Crumpsall, the original structure of which had been struck by lightning and burnt down. His next work of moment, and that which in point of importance ranks next to the restoration of the Manchester Cathedral, was the Bury parish church, which was rebuilt from his designs in 1876. This edifice was always regarded by Bishop Fraser as "the gem of the diocese." Another work of considerable importance was St. Benedict's, Ardwick, erected by the late Alderman J. Marsland Bennett, and consecrated by Bishop Fraser in March 1880. In 1885 he restored the chancel and other parts of the parish church of Rochdale, and in 1890 he designed the chancel for Littleborough parish church at a cost of 7,000*l*. As is well known, Mr. Crowther's principal work has been in connection with the Manchester Cathedral, the restoration of which he had fortunately completed just on the eve of his death. This restoration was commenced some ten years ago, and it may be said to be the crowning act of Mr. Crowther's busy and active life, not merely because it was his last, but because it is by far the most important undertaking on which he has been occupied. Mr. Crowther was a staunch Churchman; indeed, he was a High Churchman, and with his friend Mr. Edward Herford was a strong supporter of the Free and Open Church Movement at a period when it was less powerful than now.

ST. PATRICK'S CHURCH, SOHO.

A NEW church for Roman Catholics has been opened in London. The site is at the corner of Sutton Street and Soho Square. The style is Italian Renaissance. The church is built mainly in red brick. A campanile rises to the height of about 125 feet. The portico is of white Portland, supported by Corinthian columns and pilasters. The entrance porch leads through folding doors to the antechapel, or narthex, divided from the church by iron gates. This portion of the structure will remain open on all days. On the right is an entrance to the presbytery; on the left is a flight of stone steps leading to the tribune and sodality chapel. A few steps further a door leads down another flight of steps to a large confraternity room, which may be used for meetings, &c. Entering the church by the iron gates to the left is the baptistery. The organ is on the left of the sanctuary. The choir stalls are of carved walnut wood polished. The altar and altar rails are of choice Italian marble and richly carved. The sanctuary and altar steps are of marble, and the floor of the sanctuary of polished parquetry. On the left of the sanctuary is a small working sacristy, and on the right are the priests' and choir sacristies. On the right side of the church there will be five side chapels. The church consists of one open span of roof, and the floor space for benches is unbroken by pillars, so that a clear view of the sanctuary is

obtained from all parts. The lighting is from the clerestory. A semicircular roof springs from above the cornice over the windows. This roof is panelled and decorated. The new benches are of pitch-pine varnished.

The flooring of the church is in wood blocks, and the heating apparatus is of hot water. The total external length is 157 feet. The nave is internally 92 feet long and 34 feet wide, the total width of nave and aisles being internally 47 feet. The height of nave is 57 feet. The sanctuary is 27 feet long and 25 feet wide. The architect is Mr. John Kelly, of the firm of Kelly & Birchall, of Leeds. The contractor is Mr. W. H. Gaze, of Kingston-on-Thames. The wood-block flooring is by Messrs. Duffy & Co.



The Future of Architecture.

SIR,—Your own pages and those of other leading papers show very emphatically that there is much excitement in the architectural world just now, and it is to be hoped that it will not pass away without some permanent benefit to the noble art. The memorialists have spoken. The Institute has replied; but, if we may judge by the object of its general meeting of Monday last, it is not satisfied with its position. If this be true, should not a general meeting of architects be held to discuss the situation and appoint a committee, small but strong, representing both sides, or rather all sides, to report and advise as to necessary reforms; meeting again after adjournment for renewed discussion and final vote in a general meeting? One of two things must result from this course, either (1) that it is necessary to leave things alone, or (2) that certain changes at the Institute are imperative if the interest of architecture is acknowledged to be infinitely higher than the interest of the architect.

Who will be bold enough publicly to deny this proposition? —Yours obediently,
HERMES.

GENERAL.

The Eiffel Tower has been reopened and it is now possible on four days in each week to look from the open terrace on the fourth stage.

The Commission appointed to report on the designs for the Opéra Comique will be composed of MM. Jules Comte, president; Bardoux, Monis, Mesureur, Delaunay, Poubelle, Lozé, Sauton, Caron, Roujon, Régnier, Carvalho, Charles Garnier, Pascal, Moyaux, Daumet, Vaudremer, Caux, Aublé.

Mr. Reuben Bennett, of Manchester, has been successful in the competition for the decoration of the Huddersfield Town Hall. There were twenty competitors.

Mr. Joshua Horton, of Handsworth, has offered to give 1,000*l*. towards the restoration of St. James's Church, Handsworth, a work which will cost several thousands of pounds.

The "Bolton Chronicle" says:—Mr. A. Heaton Cooper has painted a picture of Wigan, showing the appearance of this ancient town in a realistic manner, and characteristic of the coal and iron industry. The picture is intended for the Royal Academy exhibition.

The New Reredos, designed by Mr. John Honeyman and executed by Mr. James Young, has just been erected in Glasgow.

Mr. J. P. Thomasson has offered a further gift of about 5,000*l*. to the Bolton Corporation, in aid of the Thomasson Park and Museum.

An Offer has been made to purchase and present to the Presbyterian College Committee a site of land on condition that a Presbyterian theological college be at some time erected on it. A further gift of 15,000*l*. would also be devised for the building of the college.

Mr. Temple Moore has prepared plans for the renovation of Redditch Church, at an estimated cost of 4,000*l*.

The Death was announced at Blackpool, on Tuesday, of Mr. Tuke, of the firm of Maxwell & Tuke, architects, Manchester. Mr. Tuke was at the time of his death engaged on the Eiffel Tower, Blackpool. Amongst other important works with which his name is connected are the Jubilee Exhibition in Manchester, the British section of the Brussels Exhibition, the Winter Gardens, Southport, and Cambridge Hall, Southport.

Mr. Edward Fitzgerald, architect, Youghal, died on Saturday, in his seventy-eighth year. He was also an enthusiastic archaeologist, and the credit of revealing the fine oak roof of St. Mary's, Youghal, belonged to him.

The Architect.

THE WEEK.

No less than one hundred and twenty-four sets of designs were sent in to the Salford Corporation in the competition for artisans' dwellings. A sub-committee of the Health Committee selected eight of the plans for further examination. The following awards are made:—Mr. WALTER SHARP, architect, Manchester, first premium, 50*l.*; Messrs. M'MURDO, HORNBLOWER & WALTERS, architects, London and Liverpool, second premium, 40*l.*; Messrs. MANGNALL & LITTLEWOODS, architects, Manchester, third premium, 30*l.* The first block will be erected in Queen Street, on land recently occupied by "dwellings unfit for human habitation," purchased by the Health Committee under their improvement scheme. The cost of the buildings is to be about 10,000*l.*, and the tenements will contain usually a living-room, bedroom, scullery, w.c., &c., forming a complete self-contained residence, suitable for workpeople living in so crowded a district.

THE conditions of the competition for the Opéra Comique, Paris, have been arranged by the committee. There will be only one contest. For the preparation of the designs two months are allowed. The first premium will be 10,000 francs, the second 6,000 francs, the third 4,000 francs, and there will be five supplementary premiums of 2,000 francs each. It will be necessary to submit three plans—a longitudinal section, a transverse section, and elevations of the principal and lateral façades. There will be an exhibition of all the designs during five days before the awards are given, and afterwards during three days. The competitors can elect five jurymen to act with those whose names were given last week. If the jury recommend the winner of the first prize as having competence to carry out the work, and if the details, estimates, &c., are approved by the Council of Civil Buildings, he will be entrusted with the commission by the Minister. The Builders' Union have petitioned the Minister in favour of the necessity of each design being accompanied by estimates from contractors who will assume responsibility for the figures.

It would be interesting to discover the percentage of the builders and contractors in Ireland who are in favour of a disturbance of the existing relations with England. It is only necessary to glance over the tables in the reports of the Irish Commissioners of Public Works to perceive how large is the sum expended on all kinds of constructive works, and which is advanced at a very low rate of interest. In a great many cases, especially arterial drainage, not more than a third or a fourth of the cost has been charged to districts or proprietors. It is not easy to perceive where an exchequer as generous and considerate is to be discovered, although it is gravely assumed the island will have to suffer from "a chronic plethora of money." The story which Mr. BALFOUR related on Tuesday reveals that the Irish people are not so carried away by enthusiasm as to forget how much turns on money, and how difficult it always is to obtain loans of money on terms that are not ruinous. "We lend Imperial money," said Mr. BALFOUR, "to build schools and glebe-houses in Ireland, and we lend it at 4 per cent. Well, an architect had sent in to a priest an estimate for a building, a glebe-house, I think it was. The priest said that the estimate was too high. The architect said, 'Take care; if the Land Bill passes there may be no British money at 4 per cent. to build glebe-houses.' 'Let us conclude the bargain at once, never mind the estimate,' was the reply." If opportunities were afforded the Irish architects, engineers, builders and contractors, and if they related their experiences of what Government money has done throughout the island, they would present the question under aspects that must make all parties reflect.

THE Panama fiasco does not appear to have made much of an impression on Parisians. They never were

more anxious to have Paris converted into a seaport by means of a costly deepening and alterations of the Seine. There are some reasons in favour of the project. Antwerp, which the great NAPOLEON endeavoured to ruin irretrievably, is yearly attracting trade which the Frenchmen consider should belong to them. Again there is a fascination in the thought of seeing big ships at Clichy in the vicinity of the city, which is irresistible to the Parisian mind. Besides the project, although costly, is not impracticable. The plan which gains most approval is by M. BOUQUET DE LA GRYE. It is estimated to cost 6,000,000*l.*, and as the works could be carried out in three years it is plain there are few engineering difficulties. The average depth of the canal need be only 6·20 mètres, and it is proposed to have a depth of 7 mètres. Although it would be necessary to have four locks, the distance between Havre and Paris may be traversed in seventeen hours.

It is satisfactory to learn that Mr. BALDWIN LATHAM is of opinion that landslips at Sandgate are not likely to be recurring phenomena. He has assured himself that the land included in the slip has become settled and will not probably move for a very considerable time to come, as the momentum with which it settled has caused an effective barrier to be raised on the seashore against its further settlement, and as at the time the ground was at its maximum degree of wetness every day there is less liability of any further movement. Mr. BALDWIN LATHAM sees no obstacle to putting every one of the houses at once into repair, without even waiting for the land-drainage to be completed, but he recommends the introduction of tie-rods wherever possible as security in case further settlements should arise. He also considers it very desirable that at as early a date as possible all the openings in the ground should be carefully filled in in such a way as to prevent any rain soaking into the cracks—that is to say, it would be well for the surface over these crevices to be raised somewhat, but it must be done with discretion, so as not to impede or allow water flowing over the surface to lie in proximity to the filled-in crevice. In that way the risk in the future will be diminished, as the ground cannot become as saturated as formerly. While there is a general desire to see Sandgate recover itself, nothing but the experience of years will persuade the public that it is a safe resort, and we are therefore afraid it will not offer so promising a field to the speculative builder as formerly.

THE announcement that Sir JOHN GILBERT, R.A., intends to present some of his paintings to the Corporation galleries in London, Liverpool and Manchester, is satisfactory for many reasons. In the first place, the gifts will be valuable, and of extreme importance as exemplifying one province of the art of our time. Sir JOHN GILBERT was the earliest to popularise the art of illustration in this country. The plates by CRUIKSHANK were limited in range, and as much might be said of the cuts by such artists as HARVEY, BROWNE, BUSS and others. Sir JOHN GILBERT presented the dramatic aspects of modern, mediæval, classical, biblical, or romantic subjects with equal happiness. As a book illustrator he was the foremost of our time. His water-colour drawings and oil-paintings bear some resemblance to his drawings on wood-blocks, because the one principle guided his hand. He never wished to suggest, like so many Academicians and other painters, that it was immense condescension on his part to co-operate in the production of woodcuts. If his figures were intended merely for a halfpenny tract they were sure to have character. Again, by presenting his work to municipalities, he recognises the truth that those bodies take more care to preserve paintings, and are more zealous for their appreciation than Government officials. It is well known that the policemen in the South Kensington Museum know more about the collections than the superior officials. It was Sir JOHN GILBERT's intention first to build a gallery for his pictures and make over the property to the nation. Afterwards he decided to enrich Liverpool and Manchester as well as London. There are fifteen or more oil-paintings, some of considerable size, in perfect and pure conditions, and all in handsome frames, and many water-colour pictures also framed.

PHILIPPE AND J. B. CHAMPAIGNE.*

THE name of PHILIPPE DE CHAMPAIGNE is likely to be remembered by visitors to our National Gallery while greater artists are forgotten: the oddness of his three views of the visage of Cardinal RICHELIEU always attracts attention. In the Salon Carré of the Louvre, his full-length figure of the Cardinal also exerts a strange power, as if RICHELIEU was still a dominating force in France from which art was not exempted. The artist was one of those men that are not easily classified. By some Frenchmen he is declared to be a representative of the French school. M. GAZIER, the author of the biography of CHAMPAIGNE which has appeared this week in Paris, declares that in his style he displayed more affinity with *POUSSIN*, *LESUEUR* and *LEBRUN* than with *RUBENS*; but there is no doubt that PHILIPPE DE CHAMPAIGNE, as well as his nephew *JEAN BAPTISTE*, were born in Brussels, although their family may have emigrated from Rheims. If Belgium has had the distinction of his birthplace, he found his training and patrons in France. When PHILIPPE arrived in Paris in 1621 (that is, in his nineteenth year), the French school of painting was still controlled by leading strings which were held in royal or ecclesiastical hands. There is no doubt he was not welcomed; there was apprehension that he might play the rôle of *RUBENS*. The young artist had been taught by *JEAN BOUILLON*, *MICHAEL DE BOURDEAUX* and one of *RUBENS*'s assistants, *JACQUES FOUQUIERES*. All through his life PHILIPPE was of a religious turn. His first dwelling was in one of the colleges that nestled round the hill of St. Geneviève; there he found another student who took a serious view of life and art, *NICHOLAS POUSSIN*, and who was at the time co-operating in the decoration of the new palace of the Luxembourg. The director of the work was *NICHOLAS DUCHESNE*, who apparently allowed his time to be monopolised by wall decoration, for we cannot recall a single easel picture by him in any of the French galleries. It used at one time to be repeated that the director was jealous of the talent and influence of his Belgian assistant, but that is one of those legends which do not rest on a stable foundation. PHILIPPE undoubtedly returned to his native city in 1627, and was occupied there when, in the following year, he received intelligence of the death of *DUCHESNE*, and an invitation from *MARIE DE MEDICIS* to assume the direction of the works. It suggests the position of painting at the time when we find that the correspondence between the Queen-Mother and the artist was conducted by an abbé. Towards the close of the year PHILIPPE married a daughter of his predecessor.

The Dervish in the Eastern fable excused himself for settling down uninvited in the Sultan's palace because it appeared to him to be a caravanserai. During the years that have elapsed since 1620, when *DESBROSSES* completed the noblest part of the palace, the Luxembourg has sheltered a great many tenants, who vanished as mysteriously as they appeared. With them the decorative paintings of which the Queen-Mother was so proud have also passed away. The great allegorical series which *RUBENS* devoted to her glorification is happily in the Louvre, retaining its pristine brilliancy, but the paintings which were executed by *DUCHESNE*, *PHILIPPE DE CHAMPAIGNE*, and the artists who co-operated with them, can no longer be identified. Still more strange is the fact that although at the time there was a great school of engraving in Paris, there seem to be no plates after the wall-paintings. Every record of a great work has passed away, like the glory of the *MEDICIS* or the justice of *LOUIS XIII.*

PHILIPPE DE CHAMPAIGNE in some way was able to hold on by the Luxembourg as an official painter, but research cannot trace his later any more than his earlier works. It was natural also that an official painter who had nothing of the Bohemian about him should be employed painting churches and chapels. These paintings also have disappeared, but we have always been of opinion that the

dramatic painting of a dome by *FLAMAËL* of Liège, in the church of the Carmes, bore some correspondence with *CHAMPAIGNE*'s paintings on the vault of that Carmelite convent which received *LA VALLIÈRE* when she fled from her royal lover. Two of his works of a decorative class, executed in 1634, remain. In the Musée of Caen is the painting executed for Notre Dame, Paris, the *Vœu of Louis XIII.*, and in Toulouse is one of the replicas of the *Cérémonie de l'Ordre de St. Esprit*. Amateurs have no reason to be grateful to the painter, for, according to *M. GAZIER*, he inaugurated that system of repetition which permits three or four collectors to possess the originals of one and the same *chef-d'œuvre*.

In the seventeenth century *CHAMPAIGNE* probably derived most respect because the *homme rouge* condescended to sit to him for portraits. *RICHELIEU* at first was not partial to *RUBENS* or to *PHILIPPE DE CHAMPAIGNE*. He was anxious that *MARIE DE MEDICIS* should entrust the commission for the scenes from the life of *HENRY IV.* to *ARPINO*, but when the Queen-Mother lost her power the Cardinal grew indifferent to the affair. *CHAMPAIGNE* painted the walls of his residences, but fate has not been more kind to those works than other efforts of the artist. In the Palais Cardinal—it is now known as the Palais Royal—where *RICHELIEU* died, *PHILIPPE DE CHAMPAIGNE* painted the vault of the gallery of illustrious men, that is, the twenty-five notabilities that *RICHELIEU* admired, the series closing with *LOUIS XIII.* and the Cardinal himself. The portraits of the Cardinal might be taken from a mask. He appears exceedingly quiet and unemotional, and might well be one of the clerks of the minister; he was not likely to wish the painter either to reveal or to flatter him in his features.

In painting the portraits of men of a different class *PHILIPPE DE CHAMPAIGNE* was not under restrictions and he could venture to express temperaments. While his portraits exist his fame will endure; the authorities of the Louvre were wise in securing so many examples. There is, in the first place, his own portrait, in which he suggests his birthplace by introducing its cathedral of St. Gudule and the tower of its Hôtel de Ville in the landscape that forms the background. On another canvas *FRANÇOIS MANSARD* and *CLAUDE PERRAULT*, the two architects, appear. It may be said that during a period of about forty years the majority of the great men of France sat to *PHILIPPE DE CHAMPAIGNE*. Many of the most interesting portraits are reproduced in *M. GAZIER*'s memoir. Here we have *TURENNE*, who, although not a Frenchman, and in spite of his Calvinism and foreign extraction, gained a marshal's bâton in his thirty-first year. In his last campaign, when he was sixty-four, he surpassed himself in audacity, although he was fighting in opposition to the desires of the king and his minister. The artist seems to have read his character more accurately than *BOSSUET*, *FLÉCHIER* or *MADAME DE SEVIGNÉ*, for while we are surprised to reconcile his cruelty with their eulogiums, it does not seem surprising that a man who looks so callous should devastate a province without any necessity. Then we have the portrait of Cardinal *DE RETZ*, which is a puzzle. Who could believe that this kindly-looking and commonplace man was a conspirator on a colossal scale, and at one time was indebted to the extent of four millions of francs? *MICHAEL LETELIER*, the chancellor, appears honest enough to deserve all the praise that *BOSSUET* bestowed on him. *VOITURE*, the poet, the first in France of the *bel esprit* type, appears as a simpering nonentity. We have, too, *JACQUES LEMERCIER*, the king's architect, who designed the Sorbonne, the Oratory and St. Roch—a face that is full of character.

There may be still one class of people in France who will set most value on the portraits, by *PHILIPPE DE CHAMPAIGNE*, which present to us the features of some of the men and women who were associated with the Jansenist experiment of Port Royal. The Abbé de St. CYRAN, who was a friend of *JANSENIUS*, came to Paris, and was able to persuade some ardent young theologians and some women of various ages to open two houses in which religious practices were to be followed. The *ARNAULD* family furnished some of the most enthusiastic recruits. *PHILIPPE DE CHAMPAIGNE* came under the new influence, and in many ways, as well as by painting, endeavoured to help the reformers. In the necrology of Port Royal it was recorded how he had always been most affectionate to the house,

* Les Artistes Célèbres : Philippe and Jean Baptiste Champaigne. Par A. Gazier. Paris : Allison et Cie.

how he had sustained its interests on all occasions even before grantees, and how he had bequeathed several pious pictures, as well as 6,000 livres. His daughter also became one of the nuns, and he has painted a portrait of her, accompanied by a nun, which is now in the Louvre. The artist was not afraid to depend for his effect on a large mass of one colour. In the full-length *Richelieu* of the Louvre the red gown is supreme, and in the portraits of the two nuns their creamy white robes are only relieved by blank walls and straw chairs. CHAMPAIGNE also painted a portrait of the superioress of the Convent ANGÉLIQUE ARNAULD. If we could believe in the doctrine of avatar, she might be taken as an illustration. Forty or fifty years ago she seemed to be a real person to some of the French academicians. COUSINS, MICHELETS, SAINTE-BEUVEs professed to have individually a property in the ancient nun. They appeared to know all her thoughts and to be in daily conversation with her; in consequence, the old gentlemen became deadly enemies of each other, for each claimed a monopoly and denounced his rivals as swindlers. The contest must have delayed the production of the famous dictionary, but it was amusing, for all the claimants to celestial communication were not remarkable for belief in supersensual affairs. One of the aims of Port Royal was to overthrow MONTAIGNE's "Essays," but it is a pity the old Gascon could not have a chance to say something in his homely, hearty style, about the ridiculous results which St. CYRAN's reform produced in our time. There was, perhaps, some excuse for the venerable immortals, as it is hard to study CHAMPAIGNE's portrait without having a misgiving that Mère ANGÉLIQUE had a little of the demure coquette under her robe. The nebulosity of her brother ANTOINE, who wrote 150 books which nobody dare read, is also suggested, and may well be contrasted with the head of St. CYRAN, that is as combative as BLUCHER's. The men of true succinct genius who were attracted to Port Royal, PIERRE NICOLÉ and PASCAL, were probably too engrossed with their work to become sitters.

The artist was so successful in portraiture there are many critics who believe that his Scripture pieces are often only groups of portraits. The figures are undoubtedly vigorous, and if PHILIPPE DE CHAMPAIGNE could be claimed as a native of Rheims, it is likely that more value would be attached to his Biblical scenes.

When PHILIPPE was in his twenty-ninth year his nephew JEAN-BAPTISTE, and to whom he showed a father's affection, was born in Brussels. He went through a similar course, worked at the painting of walls and ceilings in churches—indeed, his uncle would not allow him to accept commissions to depict lightly-clad Olympians, but there was no restriction to his representation of French victories, in which King LOUIS appeared as more than mortal. It is curious to discover that in those days the two CHAMPAIGNES were treated rather shabbily by COLBERT. The Minister was in his heart indifferent to all the fine arts, and merely used artists as tools to produce things that would gratify the royal vanity. Cunning is the characteristic of his countenance. He delayed payment for the painter's works; he employed architects to measure grand decorations and estimate their value by the square yard. Finally, he could boast of a victory, for PHILIPPE DE CHAMPAIGNE accepted cost price, which meant a saving of 3,000 francs to France. Can anyone wonder that Government departments in France should not have forgotten the precedent set by COLBERT, or that in England our officials exaggerate his methods?

Uncle and nephew appear to have led happier lives than most artists. Their style does not appear to have fallen into disrepute, for although the manner of LE BRUN was unquestionably more suitable to the costly and murderous pageants in which the king took part, the style of the CHAMPAIGNES was better adapted for buildings where religious functions were enacted. The younger artist evidently felt he did not possess the sort of genius that should assert itself, and he meekly allowed his co-operation to become almost unrecognisable. Fate has been in some respects hard on the pair, but some compensation is afforded by the genial biography of the artists which M. GAZIER has produced.

THE CLAIMS OF ARCHÆOLOGY.

AT the annual meeting of the Hawick Archæological Society a paper was read by Mr. J. C. Goodfellow on "The Status and Claims of Archæology." He alluded at the outset to the advance of this science within the last fifty years. Before that period the study of the remains of ancient nations was styled antiquarianism, and those who devoted their energies to it were looked upon as very little removed from the condition of lunacy. The antiquarian depicted by Scott was, though somewhat exaggerated, the recognised type of those who sought to add to their store of relics or to increase their knowledge of their predecessors in the drama of life. The study of antiquities had not progressed beyond the historical age. The antiquities of Egypt, Assyria, Greece and Rome had received attention from specialists and from contemporary writers, but before antiquarianism had treated on the life of the lower classes of the people there were almost no correct ideas as to how the masses lived, history generally taking cognisance only of the wealthy and powerful classes. The British Archæological Association was founded in December 1843, and since then had held a meeting annually, at which the president delivered an address full of information regarding the results of researches into subjects connected with the aims of the Association. The Archæological Institute of Great Britain was formed in 1845, and since then similar societies have been instituted in numerous towns throughout the United Kingdom. During the last six years the Rhind Lectures delivered in Edinburgh have done a great deal to indoctrinate the public mind in archæology. From the quantity (though small) of human remains found in the more northern tumuli it has been inferred that the northern tribes of England were occasionally compelled to become cannibals. Nor were the early dwellers in Scotland entirely free from being suspected of a like method of sustaining life when other classes of food were scarce. A good deal of information has been elicited concerning our rude forefathers. The cave-men who dwelt in crannogs and the earth-men who inhabited caves of natural formation, gradually became impressed with the necessity of having proper means of shelter, and in some cases of concealment. Hence it might be inferred that the construction of what John Hill Burton called "a very abundant class of structures" by the more recent dwellers in Scotland of the semi-savage type, who lived even before the race that inhabited Scotland when the Romans first visited these shores, showed a considerable advance in the life of these tribes. These earth-houses, cave-houses or weems, appeared to be scattered all over Scotland. Mr. David Macritchie has in "Underground Life" given particulars of over fifty of this class of dwellings, two of them on the Borders—at Newstead, Roxburghshire, and at Broomhouse, Edrom, Berwickshire. The passages of these underground houses are in some parts exceedingly narrow in breadth and low in height, being sometimes not more than 18 inches high and 2 feet wide. It has therefore been almost accepted as a matter of fact that those who constructed them were a diminutive race which has now completely passed away. That the underground dwellers were the predecessors of the brave and warlike tribes who, under King Galgacus, tried to resist the legions of Rome under Julius Agricola, the writer thought there could be no doubt. It has been asserted by some authors that underground dwellings were occupied until about 200 years ago. None, however, has inferred that those who first built them for shelter or retreat had occupied them since long before the Roman invasion. Mr. Goodfellow next glanced at ancient nations whose history had in many cases been supposed to be legendary. In Egypt there are memorials of a very ancient form of civilisation. The chronicles of Manetho, who stated that the ruling kings of Egypt had been composed of twenty-six dynasties before the country was annexed by the Persians under Cambyses the son of Cyrus, were for a long time considered to be mythical; but comparatively recent investigations had established the accuracy of Manetho's chronology, and the student of history now turns to the investigation of Egyptian antiquities, finding in them the memorials of a civilisation co-existent with the dawn of the historical era. Assyrian explorers had thrown an immense amount of light on the past state of nations which existed even before the great Assyrian and Babylonian monarchies which were contemporaneous with the Egyptian kings who erected the cities of Thebes and Memphis. It has been surmised that the Accadian nation must have been extinguished by the irruptive forces of barbarians who swept down with relentless force on a settled and industrious community, even as in later times the vast and imposing civilisation of Rome was submerged beneath the resistless onslaught of northern barbarians whose vandalic forces threw the consideration of art, literature and science into disorder and desuetude. Having adverted to the labours of Professor Nilsson, of Copenhagen, and our own Professor Wilson and other archæologists, Mr. Goodfellow glanced at the position now occupied by the Hawick Archæological Society. It was nearly 37 years since it was founded. Many of the original

promoters had departed to the silent land. He had on a former occasion (March 12, 1891) referred to his recollections of some of the more prominent of those whose enthusiasm and energy in antiquarian research led to the formation of this Society. If any names deserved to be inscribed on the roll-call of those who planned and worked for this Society, they were those of Robert and Alexander Michie and William Norman Kennedy. In a lesser degree there were others; but were he to name all those worthy of being so honoured he feared the list would tire their patience. Suffice it to say that the members had been able to do some small quantity of work which had enabled their town to stand forth in archaeological status, as in many other respects, "the Queen o' a' the Border." Their labours had been labours of love. During the 36½ years of the Society's existence nearly 200 essays, papers and lectures had been read at its meetings. They could rank among those who had honoured them with lectures and papers, the late Robert Young, minister of Teviothead; the late Rev. David Aitkin, D.D., formerly of Minto; the late David Dundas Scott, the learned translator of D'Aubigne's "History of the Reformation"; the late Professor Elliot, of Goldielands; Professor James Clark, a worthy son of "Auld Hawick"; Mr. Mark N. Robson; James A. H. Murray, LL.D., now of Oxford. Among the less learned, though not less worthy of recognition, might be named Robert Michie, Alexander Michie, William Norman Kennedy, Robert Murray, now of Galt, Ontario; the late Alexander Anderson Hogg, and the late Frank Hogg. The papers embraced a wide range. In the early years of the Society's existence the flora of the district received much attention from James A. H. Murray. Mr. W. Norman Kennedy's special department seemed to be the collecting of out-of-the-way anecdotes about notable persons rather inclining to wastral description, whom he with rare ability depicted under the heading of "Local Ethnology." Mr. Robert Murray chased the fairies and the gipsies, and depicted old local manners and customs; while Mr. Robert Mickie held fast to hill-forts, Roman camps, querns and nick-nackets of like character. The proceedings of the Society were printed annually from 1863 to 1885. These reports contain a mass of very valuable information relating to the town and neighbourhood—historical, biographical, critical and legendary. Nor were the reports of merely local value, for he recently saw in the catalogue of an Edinburgh second-hand bookseller one year's reports priced at 7s. 6d. About two years ago the Society published in a well-got-up volume its transactions for 1889 and 1890. Mr. Goodfellow closed by referring to works by Mr. Macritchie and Sir John Lubbock. He regretted that in these days the newspaper was more read than the treatise on past life and history, for those who comprehended the past were able to understand the present, and in some degree forecast the future.

THE INSTITUTE OF ARCHITECTS.

THE following correspondence in connection with the case *Burr v. Ridout* has passed between Lord Chief Justice Coleridge and Mr. J. Macvicar Anderson, president of the Royal Institute of British Architects:—

The President to Lord Coleridge.

March 11, 1893.

My Lord,—The attention of the Council of the Royal Institute of British Architects has been directed to your lordship's remarks addressed to the jury in the case of *Burr v. Ridout*, in which, referring to the schedule of professional practice and charges of architects published by this Institute, your lordship is reported in the *Times* of the 22nd ult. to have said that you "would not allow the Institute to dictate to juries what sum was to be paid for work not done," and again, "it was a most unjustifiable attempt by a body of men for their own advantage and to increase their own emolument."

With great reluctance I am obliged to take exception to these statements, because, were they to pass unnoticed, it would naturally be inferred that their justice is admitted.

To dictate to juries is a grave offence, of which I need scarcely say this Institute is innocent alike in thought and deed. Far from desiring to dictate to others, we do not dictate even to our own members.

The Institute publishes a schedule of professional practice and charges, a copy of which I enclose, which is not in any sense a code of imposed rules, but simply the embodiment in a convenient form of the general practice which usage has sanctioned. The charges referred to in this schedule are not binding or, to use your lordship's expression, "settled," in the sense of being obligatory. An architect is at liberty to charge what he deems his services to be worth by agreement with his client. Clause 9 of the schedule was never intended to justify, and does not appear to me to justify, such an imaginary case as that by means of which your lordship illustrated its supposed application. It necessarily assumes that the architect has performed the work entrusted to him in reasonable compliance

with the limitations imposed upon him by his client, and mutually agreed to with regard to expenditure.

It is to be regretted that learned counsel misinterpret the schedule by constantly referring to its clauses as "the rules of the Institute of Architects." The Institute has no such rules. The aim of the Royal Charter under which it is incorporated is not to impose arbitrary restrictions, but to promote the interests of architecture.

It is no doubt attributable to such erroneous interpretation on the part of counsel that your lordship was led to make the remarks I have referred to, and I feel sure you will be glad of the opportunity of relieving an honourable body of men from reflections which, if true, could not fail—emanating from so high an authority—to be prejudicial to the high character which it should be the ambition of every architect to maintain, and which it is the leading aim and object of the Royal Institute of British Architects to promote.—I have the honour to be, my lord, your lordship's most obedient servant,

J. MACVICAR ANDERSON, President.

Lord Coleridge to the President.

1 Sussex Square, W.

Sir,—I have the honour to acknowledge the receipt of your letter of March 11 containing your observations upon some remarks of mine in the course of my summing-up to the jury who with me tried the case of *Burr v. Ridout*, and which I understand you to have copied from a report of that summing-up given in the *Times* newspaper of February 22. I have no note of what I said, but I dare say my remarks are reported with substantial accuracy. I certainly have long and strongly entertained, and do entertain, the opinions and feelings therein expressed. They were not expressed in any exercise of a supposed judicial privilege to deliver oracular opinions on matters irrelevant to the issue, but they were necessary, as I think, to be expressed for the proper legal conduct of the case, and are to be justified by such necessity. The only words which, if I ever used them, I regret are "for their own advantage and to increase their own emolument." These words seem to impute a motive, and so far as they do I regret them. I have no right to confound the consequences of a rule, though very plain, with the motives of those who passed it.

Further than this I am unable to go. With the terms of contracts, however absurd and unjust they may appear, when both parties to them are free and know what they are about, I think it unwise and improper to interfere. But to justify the addition of preposterous terms to a contract on the ground of rules made by a body to which one of the contracting parties belongs and the other does not, and of which the last-mentioned party has never heard, is a very different matter. So far as any authority and influence of mine extends it never shall be done. I am obliged occasionally to say this in public in consequence of counsel, as you yourself state, endeavouring to justify charges utterly indefensible by citing the rules of the Institute in their defence. Where there is no specific sum for payment agreed upon the law implies a contract to pay what is reasonable, and what is reasonable is for the jury, not for the Institute of Architects.

I cannot help, before I conclude, mentioning as an illustration of the use to which the "Scale of Charges" is sometimes put a matter which came to my own knowledge. Many years ago a great nobleman employed an architect of great eminence to give him designs and estimates for a great work of restoration and almost rebuilding which he desired to undertake. The architect made designs and gave estimates. These were so very large that the nobleman gave up the work as far beyond what he could afford. He purchased the drawings, paid the architect several hundred pounds for his trouble and gave the matter up. More than ten years afterwards he had recourse to another architect, and executed under his control an entirely different building for less than half the money estimated by the first architect. When the work was completed the first architect demanded 2½ per cent. upon the nobleman's outlay, and justified this demand by the "Scale of Charges" of the Institute. I was consulted by the nobleman, and I advised that the claim was an extortion and that the nobleman should decline to pay one penny. The nobleman took my advice, and the architect's demand was not further prosecuted. This is by no means a solitary, though perhaps the worst, instance within my own knowledge of the manner in which some architects, and architects of eminence, use the "Scale of Charges" of the Institute, and I must claim the right to speak of such conduct as I think it deserves when the duty appears to me to be cast upon me of speaking at all.

I should be very sorry to be supposed to reflect upon the honour of a profession to which Michel Angelo and Sir Christopher Wren belonged. I am bound to respect their honour as much as I do my own, and I hope I have never been found wanting in this part of my duty.—I am, sir, your obedient humble servant,

COLERIDGE.

P.S.—Let me add that I have hardly expressed adequately my sense of the perfect courtesy and good feeling with which

you have discharged what must have been to you an unpleasant task, and I beg of you to accept my hearty acknowledgments.

C.

The President to Lord Coleridge.

March 20, 1893.

My Lord,—I beg leave to acknowledge your lordship's letter, and to express my obligation for the courtesy with which you have so promptly and fully replied to the remarks I reluctantly felt it my duty to address to you on behalf of the Royal Institute of British Architects. I have no reason to regret having done so, inasmuch as I have thus been so fortunate as to have elicited from your lordship a frank expression of regret—which I much appreciate—for having used words which seemed to impute an unworthy motive to the Royal Institute.

If I might refer to the opinion to which your lordship has given forcible expression respecting the use that is sometimes made of the Schedule of Professional Charges published by the Royal Institute, I would say with confidence that, although the Schedule may not be perfect in point of phraseology, it was certainly never intended to be used as a lever for claiming extortionate charges, and that such use, if resorted to, is perfectly unjustifiable.

In respect to the case which your lordship has quoted by way of illustration, the only surprise I experience is how any amount of ingenuity could extract from the schedule of the Royal Institute any justification for raising a new claim more than ten years after a settlement had, as I understand, been arrived at by mutual agreement.

The remarks to which I took the liberty to direct your lordship's attention have created a great deal of soreness among members of my profession, and I feel sure that it would be the source of much satisfaction were this correspondence to be published in the *Journal* of Proceedings of the Royal Institute. I venture, therefore, to express the hope that I may be favoured with your lordship's sanction to such publication in the next number of the *Journal*.—I have the honour to be, my lord, your lordship's most obedient servant,

J. MACVICAR ANDERSON, President.

Lord Coleridge to the President.

March 22, 1893.

Sir,—In reply to your letter of March 20 I am directed by the Lord Chief Justice of England to say that his lordship has no objection to your publishing the correspondence which has recently passed between him and yourself relative to the case of *Burr v. Ridout* and his lordship's remarks thereon.—I am, your obedient servant,

EGERTON B. LAWFORD, Secretary.

THE BATEMAN HEIRLOOMS.

IT has been decided to dispose of the Bateman heirlooms, and, in accordance with the order of the Court of Chancery, the first portion will be offered by Messrs. Sotheby, Wilkinson & Hodge on the 14th inst. This collection (which was begun many years since by the late Mr. T. Bateman, and afterwards considerably augmented by his son, the late Mr. W. Bateman, the author of "Ten Years' Diggings," &c.), embraces an extensive variety of objects. Amongst the enamels are a fine triptych of early Limoges in its original oaken case, and a charming little cup of later date, with figure of Orpheus, from the Bernal collection. There is also a very remarkable relief, exquisitely carved in Oriental alabaster, heightened with gold, of the Crucifixion, from the Earl of Shrewsbury's collection. The early ivory carvings are particularly noticeable, and begin with a remarkable diptych of the sixth or seventh century; but the gem of this series is undoubtedly the diptych, or, as suggested, covers of the Gospels, formed of two panels of ivory, depicting incidents in the life of the Saviour, mounted in a border of bronze gilt plaques, with figures in high relief, *repoussé*. This valuable example of early Christian art, originally from the cathedral at Trèves, was acquired in 1856 at the sale of the collection of the poet Samuel Rogers. There are also some very interesting specimens of early ecclesiastical art in metal, &c., such as reliquaries, chalices, and the head of a pastoral staff. Also amongst the later works in metal are two remarkably fine bronze ewers in the form of lions; and an exquisitely designed gorget of bronze richly gilt and *repoussé*, with a battle scene. The silver includes, among other specimens, a fine cup with cover of Nuremberg work, and a very interesting specimen of the silver-worker's art of the seventeenth century in the form of a mace, given by Charles I. to the Corporation of Leicester. An object that will doubtless attract considerable attention is an English hornbook of the time of Charles I., one of the very few specimens of its kind known. Messrs. Sotheby, Wilkinson & Hodge have published a catalogue with illustrations by the autotype process. The library and collection of coins will also be sold by Messrs. Sotheby during the season.

ANTONIO CANOVA.

IT was at Possagno, a little village situated amidst the Asolani Hills, at the foot of the Venetian Alps, that Antonio Canova was born on November 1, 1757. Though "science frowned not on his humble birth," a mud-wall cottage was his earliest receptacle. Pietro, his father, died when the boy was no more than three years old, and his mother, Angela Zardo, married shortly afterwards, and returned to Crespano, her native town, leaving her son to the care of his paternal aunt, and of his grandfather, Pasino. Antonio was thus left an orphan in his most tender years, and possessing but a feeble constitution and weak frame he required all the indulgent attention of his sympathising guardians. Caterina Ceccato, his aunt, nursed him with all the fondness of a mother, and infused into his heart the love of poetry by singing to him the wild ballads of his native country. The effect thus produced upon the flexible mind of the artist in relation to his future character may be inferred from his own warm acknowledgments of the melody communicated to his soul by those early strains.

His grandfather was no less watchful over his education in the line of art of which he was afterwards to be the greatest ornament in modern times. Though humble in circumstances, both the father and the grandfather of Antonio were sculptors of excellence in their way, but their operations were confined to the monuments, altars and similar works consecrated to the purposes of religion in the churches of their neighbourhood. His grandfather taught him the early use of the implements of sculpture, by which means he acquired that mechanical skill which has characterised his future works, and given to them a finish superior to that of any other sculptor.

The patrician Giovanni Falier has the merit of being the first patron of the artist. He introduced him to Giuseppe Bernardi, surnamed Torretto, nephew and pupil of Torretto, a Venetian sculptor, then engaged on some works in the neighbourhood of the villa of Asolo. It was in the tenth year of his age that Canova obtained the notice of the noble family of the Falieri, and the incident by which the young artist achieved that advantage is no less creditable to his ingenuity than his fortune was propitious in obtaining so excellent an opportunity for the display of his dawning talents. The youth had acquired a taste in modelling flowers, and at a feast prepared by the Falieri at their palace in the neighbourhood of the artist's birthplace a crowning ornament was wanting to complete the beauty of the dessert. Old Pasino had tried in vain to invent something for the occasion; the dinner was set forth, the guests were assembled, and the domestics were in confusion when young Antonio, with wonderful rapidity, modelled a lion from butter. Such was the skill with which this juvenile performance was effected that it excited universal astonishment among the assembly, before whom he was called, blushing, to receive their first applause and caresses, and to obtain the earnest of the distinguished patronage of the Falieri. The encouragement afforded by this small instance no doubt operated powerfully on the mind of Canova; from this period his fortune was made, and he was soon destined to receive the support of all the great and wealthy personages of his native land.

The young artist was placed with Torretto, and accompanied him to Venice, after the completion of the works which that sculptor had then in hand. The death of Torretto happening soon afterwards, deprived Canova of many of the advantages anticipated, and he was left without restraint to pursue his own course, when he had acquired little more than the rudiments of his art. Falier, his patron, still continued to protect him, and the source of knowledge in the gallery of plaster casts of the Commendatore Farsetti, in conjunction with the emulation excited among young artists at that time in the Academy at Venice, had a tendency to improve the taste of students precursory of future excellence. Canova was now placed with Gio Ferrari for about a year, after which, feeling convinced of the necessity of a wide deviation from the then rules of art, he determined on exploring new paths of study. His proficiency even at this period, when not more than fourteen years of age, is testified by two baskets of fruit, which are deposited on the first landing-place of the Farsetti palace, now the Hotel della Gran Bretagna at Venice.

In his sixteenth year Canova completed his first effort in following the tendency of his own genius. It was the statue of *Eurydice*, and in the following year he began that of *Orpheus*. But the most elaborate of his compositions previously to his departure from Venice was the group of *Dadalus and Icarus*, in which he is stated to have evinced his daring abandonment of conventional modes, and his devotion to the dictates of nature.

The strong manifestations of genius already given and the rapid progress made by Antonio induced his noble patron to procure for him an extension of means and a loftier theatre for the exercise of his powers, and, in concert with the Chevalier Girolamo Zulian, then the Venetian ambassador to the Holy See, Falier procured for the young artist the means of visiting Rome. Accordingly in December 1780 Canova entered for the first time that seat of the arts, and in the December following

the Venetian Government granted him an allowance of 300 ducats per annum for three years for his support during his studies. He now possessed the advantage of access to the house of the Venetian ambassador, which was indeed a kind of athenæum and frequented by all the genius and talent of the city. This enlightened and accomplished nobleman, entertaining a high regard for the genius of the youthful artist, procured from Venice a plaster group of *Dædalus and Icarus* for the purpose of exhibiting it to the artists and connoisseurs at Rome. The group was shown in the presence of Canova, surrounded by Cades, Volpato, Battoni, Gavin Hamilton, Puccini and others, who viewed it with silent astonishment, not daring to express censure at the variance of style from the established rules. Canova has frequently expressed the embarrassment and anxiety he felt on this occasion.

On his arrival at Rome Canova commenced a critical study of the best models of ancient art, but not with any view of sacrificing his previous regard for nature. He still preserved his contempt for conventional modes in the arts and blended the most lofty conceptions with correct taste. It must, however, be admitted that the auspicious circumstances by which he was surrounded materially contributed to awaken those sentiments in his still youthful mind. And to give him credit for an intuitive perception of all those great principles which he introduced in his own department of the arts would be injustice to other distinguished characters. The encouragement to correct studies given by the Marquess Tanucci, at Naples; the protection afforded to literature and the arts at the Courts of Charles III., Leopold, Benedict XIV., Clement XIV., Pius VI. and by Cardinal Silvio Valenti, the Colbert of the Holy See; by the Albani, the Zelada and the Borgia; the studies of Mazzocchi, Bajardi, Galliani, of the two Venuti, of Maffei, Gesnero, Gori, Passeri, Paoli and Amaduzzi; the good taste diffused by Cochin, Bellicard, Burlington, Mariette and Sir William Hamilton; the Herculanæum discoveries; the travels of St. Non, Norden, Pocock, Wheeler, Spon, Revet and Stuart; the exact admeasurement of ancient architecture by Des Godetz; the masterly works of the Piranesi on the antiquities of Rome; the illustration and rendering public of galleries and museums by means of engraved copies; the opening of the baths; the study of the galleries of the Vatican; the excavation of old edifices; the collection and illustration of old inscriptions by Morcelli Marini, Zoega, Fea and Akerblad; the great works of Visconti and Winklemann; the enlightened taste of the Earl of Bristol and of the Ambassador d'Azara for these studies; the genius and profound erudition of Hancarville; the valuable collections of Hamilton, Jenkins and Agincourt; the perfection of the intaglios of Pickler; the fine and bold designs of Flaxman; the attractions given to these studies by the accomplished Algarotti; the triumph over prejudices of the formidable Milizia; the labours of Temanza and Lanzi—these are all spoken of as having supplied to Canova immenses sources of aid, and to point to the favourable moment for a different direction to sculpture from that which was then pursued by living masters.

It must, however, be admitted that the first works which Canova saw at Rome are now sunk into utter disregard, and that all trace of any inducement to excellence in them is lost. So wayward is the course of genius, and so peculiar is the road it prescribes to its progress, that the most trifling circumstances may furnish hints for improvement, but all stages of advancement are absorbed in the grand result. It is this peculiar quality of the human mind which confers the stamp of originality and leads us to attribute more to intuition than to a happy combination of circumstances united with a quick perception. It is the habit of perceiving things which are beautiful that creates a correct taste, and it is the application of knowledge under exciting influences that forms genius.

It is not a little extraordinary, and redounds in no small degree to the honour of Venice, that at the period when Canova was reviving a correct taste for sculpture in his first works in the papal city, Ottone Calderari was also successful in reforming architecture by introducing in Vicenza the Grecian taste; while Querenghi was also improving St. Petersburg by the erection of splendid edifices.

In order to afford a more powerful instance for the development of the powers of Canova, the Chevalier Zulian placed a block of marble at his command for the execution of any subject he might choose. From this block Canova executed *Theseus*, the conqueror of the Minotaur, which was so admirably performed that it was pronounced to be of Grecian workmanship on the cast of the head being produced before a party of artists and critics, assembled at the house of the Venetian ambassador. But the astonishment of these gentlemen when they were conducted before the original exceeded all bounds, and they at once acknowledged that by the work a new career had been commenced in the arts.

The three years for which the pension had been granted by the Venetian Government had now nearly expired, and the friendship of Giovanni Volpato had procured for Canova an

order to execute a monument for the celebrated Ganganelli. This order was highly flattering to Canova, yet he felt that he could not execute it until he obtained the permission of the Venetian Government as to the place of his permanent residence. In 1783, having visited Venice, he returned to Rome, where he remained during the remainder of his artistic career. The completion of his monument of Ganganelli excited the admiration even of Francesco Milizia, the most celebrated critic of the fine arts at that period.

During the progress of this great work he modelled a youthful *Psyche*, and many other beautiful works, and in 1790 his compositions in bas-relief began to appear. These performances were executed as a kind of recreation from severer studies, though no other artist had ever attempted anything in the same style.

The rapidity with which Canova worked ceases to be matter of surprise when it is known that he was not in the habit of delaying one work till he had completed another, but that while his chisel was employed on the monument of Ganganella, the clay model of that of the Pope Rezzonico, which was placed in the church of St. Peter in 1792, was in preparation.

One of the principal characteristics of Canova's works is the exquisite softness and delicacy of contour which he imparted. Unlike some other artists of the same period, he took great pains in finishing his own works. His mechanical skill was particularly useful to him in that respect, as by it he was enabled to improve the expression of his figures without incurring risk. His own hand completed what it had begun, and inferior workmen were never entrusted by him after reducing the block to the last stratum of the superficies. The lovers of art have had reason to regret the extreme anxiety of Canova in the completion of his works, as the labour and sedulous care which he used contributed to shorten his valuable existence. The use of the trapano and its constant pressure on the breast are supposed to have originated the complaint in the stomach which ultimately terminated his life. To relieve him for a time from the toils of his profession the Prince Rezzonico took Canova with him to Germany and Prussia. Canova visited Vienna and Berlin in company with this prince, and found the journey highly beneficial to his health.

The talents of this extraordinary man were not confined to sculpture, for during the interval between 1792 and 1799 he devoted his attention to painting, and executed twenty-two pictures. He then laid by this art until 1821. He does not appear, however, to have entertained a very high opinion of his own talents in this respect, but to have taken up the pencil more as a diversion from the more laborious exercise of the chisel than with any view of extending his fame. Probably devotion had some influence on his mind to induce his pictorial attempts, for he executed a large painting, of the height of twenty eight palms, for the church of Possagno, his native village, the subject being the appearance of the Eternal Father to the three Marys, and the disciples lamenting over the body of Christ.

In his personal habits Canova was regular. His declining health and his arduous pursuits alike contributed to promote abstinence rather than excess, though he was sensible of social pleasures. He was an early riser, and pursued his avocations with unabating ardour from the dawn of the morning till dusk, with the exception of the time necessary for refreshment. He usually slept a short time after meals to resuscitate nature. His evenings were spent with his friends at his own house, and he seldom went from home.

Canova disliked having pupils, not from motives of jealousy, but his avowed reason being that he did not wish to fetter rising genius with his own fame, as he was aware that any considerable proficiency in them might have been attributed to his instruction more than to their own merits. Probably, however, his own unwearied application and the vast extent of his engagements precluded him from undertaking the responsibility of instructing others in his art. He felt little annoyance from criticism, which, if just, he permitted its influence to produce amendment, but if contrary to a fair spirit of candour, he never allowed it to ruffle the serenity of his temper. He never harboured jealousy towards contemporary artists, but was the friend and patron of genius in every department of the arts. Flattery gained no ascendancy over his mind, and he possessed so excellent a knowledge of what was truly estimable in his works as to be enabled to detect their defects. In this respect he was the severest critic of his own performances, and the eulogy or censure of others were received by him without an appearance of satisfaction or disgust. A faint smile would seem to overcast his fine expressive countenance when the ignorance of some half-taught amateur occasionally exposed itself, and when any subtle connoisseur gave him credit for an excess of refinement, and in reference to some particular point in a work attributed to him credit for a minute perception or peculiarity of discrimination, Canova would coldly reply that verily he had thought of no such thing.

Canova never married, though he more than once felt the passion of love. It is probable that his devotion to the arts

supervened every other consideration, and that his mental faculties triumphed over all ideas of personal enjoyment. His whole soul was absorbed in his profession. He was also susceptible of friendship, and delighted in the contemplations of youthful days, when cares and anxieties had not embittered his life with melancholy reflections and labour and study had not exhausted his vital energies. The ardour of his nature remained unabated, and his lofty spirit soared above the sickness and infirmities of his body.

It was no less fortunate for Canova than for the arts that the political strife which agitated Europe did not affect his labours: as if by common consent all countries paid the tribute due to his genius by exempting him from the baneful influences of military despotism and warlike movements. He was required to record the actions of the great military chieftains of the day, and France and Austria vied with each other in their patronage towards him. In 1802 he was summoned to Paris to execute a monument for Napoleon, and in the interval of his journeys thither he made a second visit to Vienna to complete monuments for the imperial gardens and for the church of the Augustines. The delicacy and loveliness of Canova's female forms caused him to be called the sculptor of Venus and the Graces, and he was equally happy in his colossal groups and individual masculine characters, as is testified by his group of Theseus and the Centaur, Hector and Ajax, Hercules and Lichas, the equestrian monuments at Naples, his statues of Napoleon, Washington and of the three pontiffs.

The honours and distinctions conferred on Canova exceed any instance of the kind in the history of the arts, but it is said of him that "although decorated with the equestrian orders of many great sovereigns, decreed noble in several states, dignified by titles, enriched by pensions, honoured by important charges and functions, received with distinction at all courts, desired in all societies and associated with all the principal academies in Europe, he still preserved the simplicity and modesty of his character, and even in the usual acknowledgment of these honours which he was called on to make he avoided studiously all unnecessary pomp and ostentatious display."

The disposition of Canova was charitable, and his benevolent contributions on the foundation of the Roman Academy of Archaeology and in pensions for the support of young pupils were considerable. He also assisted in procuring books for the Academy of St. Luca and aided the funds of the Academy de Lincei. The nobleness, delicacy and secrecy with which he relieved the wants of decayed artists were distinguished equally with the munificent encouragement he afforded to youthful aspirants in their devious path of life. His active generosity in those respects frequently embarrassed his own finances. Thus were the rewards of sovereigns not confined to himself, but diffused by him as from the hands of a faithful steward to promote the happiness of his fellow-men. This characteristic of Canova was particularly manifested in 1811, when Rome, "deprived of its sovereign, deserted by foreigners, empty and impoverished, saw the votaries of Pallas and the Muses pining in their workshops without the means of support and even perishing for want." At this juncture Canova stepped forward, and with a munificent and noble spirit judiciously distributed the means of succour to the students and those who desired employment in every department of the arts.

Among the many other events of this extraordinary man, history will record with reverential gratitude his exertions on the last journey he made to Paris, when he mingled with the great personages there assembled to reclaim the spoils which the conqueror of Italy had taken from the Vatican. His re-entry into Rome was a signal triumph; "again the Transfiguration heard hymns in honour of the memory of Raphael and the Apollo and Laocoon recalled to Rome, now weak and fallen, the memory of those joyous days when, amidst the triumphal pomp of a Titus or an Emilius, the spoils of conquered nations entered her walls."

Canova always profited by his experience in the arts, and every new incident in his life seems to have afforded a hint for refining his taste as well as maturing his judgment. He was not above acknowledging the sources of his improvement even at an advanced period of life, when fame had ascribed to him established peculiarities of excellence in his art. He expressed the advantages he had derived from his voyage to England, which afforded to him the opportunity for the first time of contemplating the marbles of the Parthenon in the British Museum.

In 1821, after visiting Possagno, he returned to Rome and modelled the group of the *Piety*. In the winter of the same year he modelled a monument for the Marquis Berio, of Naples; also seven designs from the metopes of the church at Possagno. In the spring of 1822 he completed with most exquisite taste the group of *Mars and Venus* for His Britannic Majesty, and also finished for two English noblemen the recumbent statues of *The Magdalen* and *The Endymion*, in addition to which objects he continued his labours on other works previously in hand, and among various busts and other

minor works, *The Sleeping Nymph*; *Dirce, Nurse of Bacchus*; a repetition of *The Nymph Awakened at the Sound of a Lyre*, and a *Danzatrice*.

In the ensuing May, after visiting Naples to view the wax of his second colossal horse, he returned to Rome affected with a disorder in his stomach, and after a partial recovery he left the papal city for the last time for Possagno in quest of health from the air of his native hills. On the 17th of the same month he arrived at that village much exhausted by travelling, which on this, as on most other occasions with him, had been too rapid for his declining health. He remained there no longer than October 3, and on the 4th he arrived at Venice, where he intended to stay for no more than two or three days. But as soon as he had taken up his abode under the roof of the Casa Francesconi he took to his bed. His disorder continued to grow worse, and his stomach failed to perform its functions. Medical skill was useless, and could not relieve him from a distressing hiccough with which he was afflicted. He was conscious of his approaching dissolution, and received with composure the announcement to arrange his worldly concerns. He appointed his step-brother, the Abbate Giovanni Battisti Sartori, sole executor, making him more the distributor of his wealth for other beneficent purposes than the possessor of it for his personal advantage. The task was however undertaken with all the fidelity which had characterised his kind relative, who had glorified in his fame, had been the companion of his travels, and now felt more grief at his death than all his other friends.

The last days of Canova were marked with calmness and resignation. He received the offices of religion with devotional respect, and though aware that all human aid was unavailing, he took with kindness of manner the soothing remedies proffered by his friends. On these occasions he was used to say, "Yet give it me, that so I may remain a little longer with you." To those persons who moistened his dying lips he said, "Buono, buonissimo, ma è inutile,"* and his last words were "Anima bella e pura."† He spoke no more, but his countenance became radiant, and his eyes beamed with expression, indicating that his mind was engaged in some sublime conception. His death took place on the morning of October 13, having then nearly completed the sixty-fifth year of his age.

On a *post mortem* examination of his body it was discovered that his death had been caused by a paralysis of the stomach, by which the passage of the food into the intestines had been impeded.

The death of Canova created the deepest affliction throughout Venice. The patriarch himself performed the funeral ceremonies, and the members of the Academy supported his bier to the church and thence to the academic hall, the walls of which were hung with engraved copies of his works, which appeared so numerous that they seemed the labours of a whole race of artists, rather than of one man. The President of the Academy delivered the oration, which excited in the minds of the assembly the deepest emotions. The only torch which burnt beside his bier stood on that ancient bronze which had for so many centuries received the votes of the patricians in the hall of the great council, and was deemed a suitable candelabra for the last offices paid to the latter glories of the Venetian state.

At the conclusion of this ceremony the remains of Canova were removed to Possagno, and so large was the assemblage of the inhabitants of the district who attended the last ceremonies, that the prelate was necessitated to address them in the open air. All Italy mourned his death, and all Europe sympathised with her in the misfortune.

TESSERÆ.

Soil and Timber.

IT is found that the value and properties of wood vary very greatly, according to the soil and climate in which it grows; it is well known that the oak timber grown in neighbouring parishes often varies in goodness to a remarkable degree, and certain parts of England used formerly to be celebrated as yielding the most valuable ship-timber. Precisely the same holds good on a large scale, and the same tree which grown in one country affords a first-rate timber may, in another situation, yield a very inferior wood. Thus the wood of a teak-tree grown in Malabar will be decidedly superior in quality to the wood of one grown in Moulmein, and the mahogany grown in Cuba will be more valuable than the same tree grown in the swamps of Honduras. It is unnecessary to point out the important bearing of these facts on the formation and management of forests.

* Good, very good—but it is in vain.

† Pure and lovely spirit.

Vaulting in the Cloisters at Norwich.

The cloisters of Norwich Cathedral were begun in 1297, and not completed until 1430. Its four ambulatories represent four successive styles, the contrast in the details being rendered more conspicuous by the uniformity of the general design, which has been so much respected during the progress of the whole work, that even the isolated shafts, which form the proper mullions of the windows of the thirteenth century, have been continued throughout, contrary to the usual practice of the Middle Ages. The vaultings are similar in the general plan and dimensions on the four sides, but each is distinctly marked with the mode of treatment employed in the successive periods, and it is to the progressive variations in the form of the spandrels, exhibiting a gradual transition from a square section to a semicircular one, that we are now referring. In the oldest portion of the work, the eastern compartments, the horizontal section of the spandril, taken about halfway between the plane of the impost and the crown of the arch is perfectly square, and this form is more strongly developed—exaggerated, it may be said—by a slight setting back of the ribs between the cross springers and the diagonals, which gives greater prominence and a more marked expression to the angle of the spandril. In the south walk, the next in chronological order, the intermediate ribs, instead of being set back, are brought slightly in advance of the other ribs. The effect of this arrangement is to give a polygonal character to the spandril, which is, in fact, still square in its general form. In the west walk the polygonal character is fully developed and the square abandoned, but the angles of the polygon are far from being equal. In the western walk, the latest portion of the work, four centred arches are introduced, and the curves of the haunches being all alike, and the middle section of the spandril circular, the polygon formed by the front edges of the ribs is equiangular, as in fan vaulting. These effects may be confirmed by the comparison of contemporary examples, but it rarely happens that they can be found in a series and in a work of which the uniformity of design is for the most part preserved, so that changes of this kind are rather to be regarded in the light of embellishment, or as the modern improvements of the day added to the original design. Thus it is that in this respect the cloister of Norwich is so valuable by enabling us to discover many of those improvements which it is more difficult to pick out of examples complete in the character of their own age.

Early Telegraphy.

When Arthur Young was travelling in France in 1787-89, he met with a Monsieur Lomond, "a very ingenious and inventing mechanic," who had made a remarkable discovery in electricity. "You write two or three words on a paper," says Young; "he takes it with him into a room, and turns a machine enclosed in a cylindrical case, at the top of which is an electrometer, a small, fine pith-ball; a wire connects with a similar cylinder and electrometer in a distant apartment; and his wife, by remarking the corresponding motions of the ball, writes down the words they indicate, from which it appears that he has formed an alphabet of motions. As the length of the wire makes no difference in the effect, a correspondence might be carried on at any distance. Whatever the use may be, the invention is beautiful." This discovery, however, lay unnoticed for a great number of years, though the apparatus was designed to effect the same end as the electric telegraph by means very similar. The possibility of applying electricity to telegraphic communication was conceived by several other persons long before it was attempted upon a practical scale. The Rev. Mr. Gamble, in his description of his original shutter-telegraph, published towards the close of the last century, alludes to a project of electrical communication. Mr. Francis Ronalds, in a pamphlet on this subject, published in 1823, states that Cavallo proposed to convey intelligence by passing given numbers of sparks through an insulated wire; and that, in 1816, he himself made experiments upon this principle, which he deemed more promising than the application of galvanic or voltaic electricity, which had been projected by some Germans and Americans. He succeeded perfectly in transmitting signals through a length of eight miles of insulated wire; and he describes minutely the contrivances necessary for adapting the principle to telegraphic communication.

The Planning of Stonehenge.

The periphery of Stonehenge is a perfect circle: the adytum is a segment of an oval. Now the first time that a savage threw a stone into a pool of water, he would be attracted by the beauty and symmetry of those concentric outlines which would be thrown off from the point of impulse. No less would he be struck with the optical effect produced by the rotation of his sling. This would soon be followed by an operation easily effected, the tracing of a similar figure from a centre upon the sand. The process is so obvious that we have little doubt of the art of drawing circles having been attained before that of numbering to ten. No great geometrical skill, therefore, was required to draw the outline of Stonehenge. To construct an oval certainly requires some geometrical skill; more, indeed,

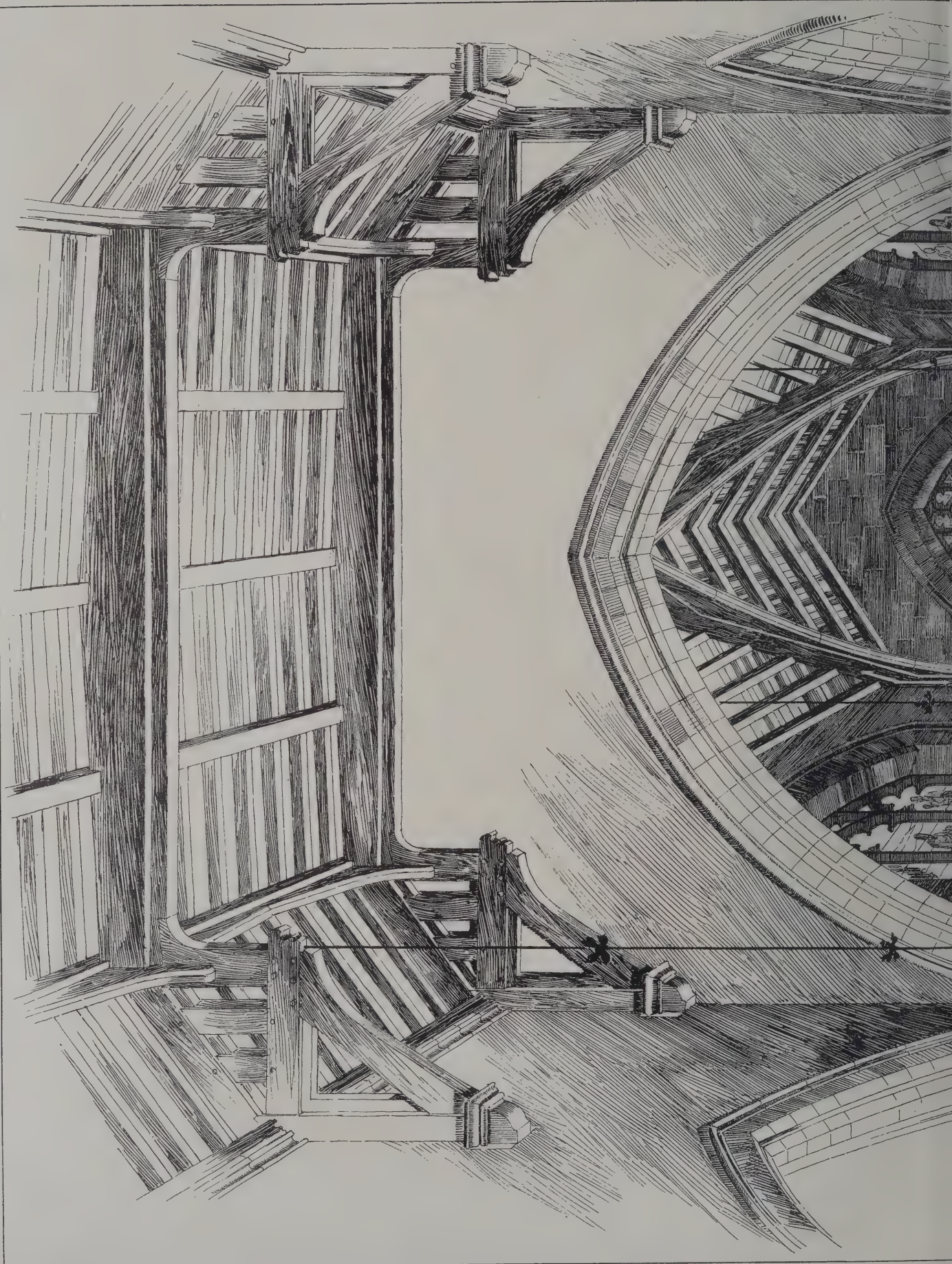
we fear, than the Druids possessed; but here is a considerable fallacy. For if the position of the stones in the adytum of Stonehenge be really such that Inigo Jones could mistake it for an hexagon, the result of more accurate measurements could only be that an oval might be so drawn as to come into contact with some portion or other of their vast masses. In short, it is such an oval as a gardener would tread out; a fortuitous and inartificial approach to the geometrical form.

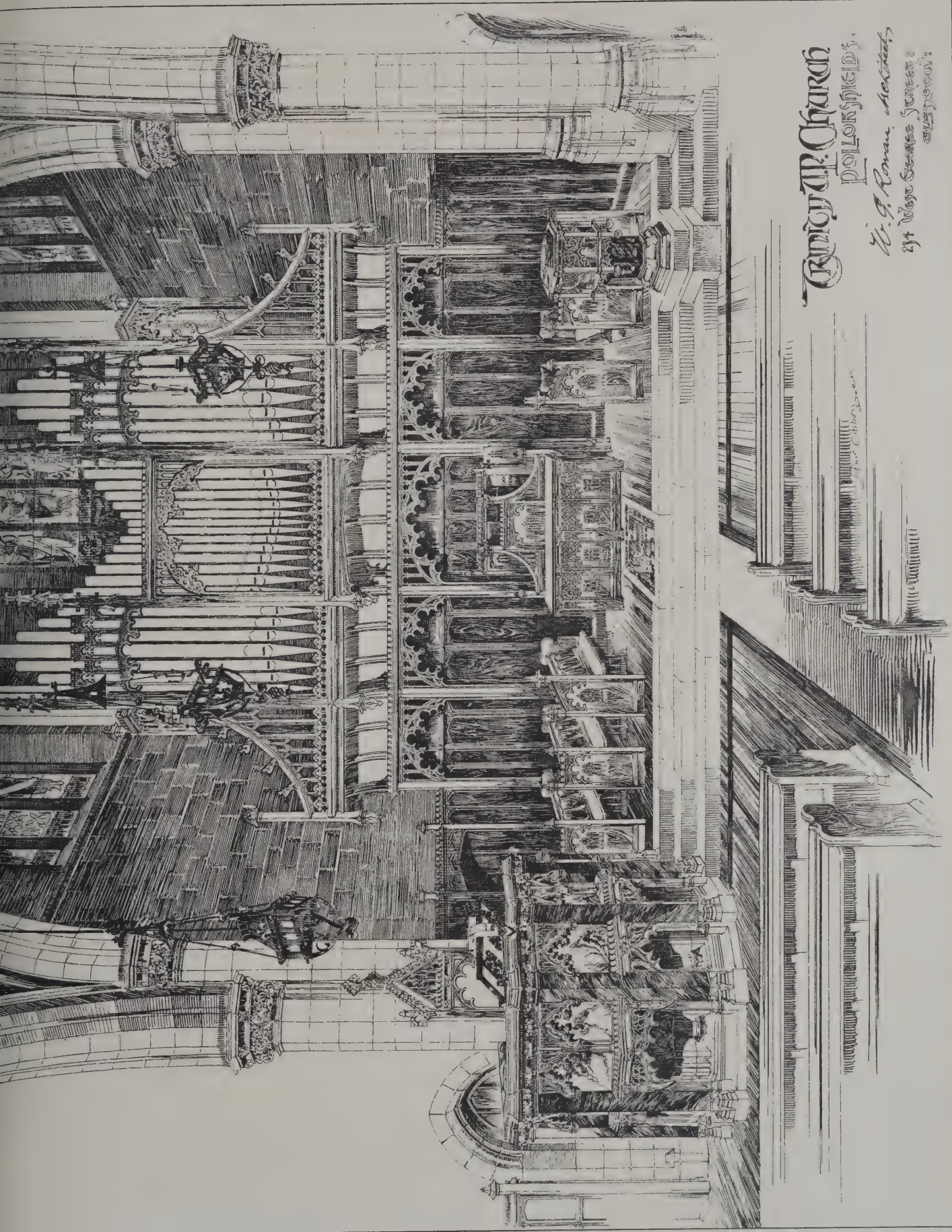
Polychrome in Sculpture.

It is well known that the ancients occasionally added colour to their statues. The colours employed were probably never intended to increase the resemblance of the object to nature, but they served to insure distinctness or were merely for ornament. The gilding of the hair, for instance, however objectionable, would not be condemned on the ground of its being too close an imitation of real hair. So also the colour which was sometimes appropriated to the statues of *Mercury*, *Bacchus* and *Pan* would never be mistaken for flesh. Sometimes the accessories only were coloured. An epigram, ascribed by Heyne to Virgil, alludes to a statue of *Amor* with parti-coloured wings and a painted quiver. But the mixed materials of some of the statues even of Phidias, the gems inserted for eyes, and the silver nails of other figures, all indicate a practice which the taste of modern artists condemns, and which was perhaps condemned by the ancient sculptors also. In many cases religious devotion may have interfered to decorate a statue, as paintings of the *Madonna* are sometimes adorned with real necklaces and crowns. In the instance of the chryselephantine statue of *Minerva* by Phidias the Athenians insisted that the materials should be of the richest kind. Notwithstanding these facts and the difficulty of altogether exculpating the artists, it is quite certain that it was impossible to carry further than they did those judicious conventions in sculpture which supply the absence of colour. It may, therefore, be presumed that such supposed absence of colour was with the ancients an essential condition of the art, and it will appear that this condition materially affected its executive style.

Lightning Conductors.

When St. Bride's Church, Fleet Street, was struck in June 1764, the effects were described as being exactly similar to those which would have been produced if gunpowder had been pent up in the same places and exploded. A stone weighing 70 lbs. was shot out to a distance of 50 yards. Then as to the heating effects. When the New York packet was struck in the Gulf Stream in April 1827 a metal chain was knocked to pieces, some of the links were fused, and the melted iron fell in glowing drops upon the deck, which was set on fire. The metals vary considerably in conducting power. If that of lead be taken as 1, tin will be 2, iron 2.4, zinc 4, and copper 12; so that copper is the best metal for the purpose. To prevent resistance and the danger of fusion, the dimensions of the metal, whether in the form of wires or of bands, must be attended to. We have no evidence that a rod of copper three-quarters or even half an inch in diameter, or an equal quantity under any other form, has ever been fused by a stroke of lightning. But when the lightning seizes on smaller portions of metal, such as the bell-wires of a house, the conducting power not being sufficient, they often become heated to such an extent as to be dissipated in oxidised vapour. Guided by what we know respecting the laws of conduction, but chiefly by the examination of a large number of reported cases, the dimensions of conductors have been determined. Copper tubing from 1 to 2 inches in diameter, made of metal of about one-fifth of an inch in thickness, may be used. The tubes may be made in lengths of 10 or 12 feet, so as to be screwed end to end, and they may be attached to the masonry or brickwork by means of rings or flanges fastened with copper nails. But as copper is a costly metal, and as such liable to be stolen, iron, although a five-times worse conductor, may be used. If galvanised it will resist the weather. Wrought-iron tubing 2 inches in diameter, made of metal three-quarters of an inch thick, and arranged to screw together in lengths, would answer the purpose. It may be fixed by couplings of cast-iron. If a solid rod be used it should not be less than three-quarters of an inch in diameter. In many cases the conductor may be in a straight, continuous line, projecting in a point like that of a bayonet a few feet above the kitchen chimney, and terminating in a forked metal branch in the earth to the depth of a few feet, or if practicable in a well or a wet drain. If there be any metal water-pipes or other masses of metal about the building it would be desirable to unite these with the conductor by means of metal ties. The conductor should be fixed to the building, not detached from it, and on no account be insulated by glass rings or pitch, as is sometimes done. If the building be of considerable extent a conductor should rise from each prominent point, and all the conductors be connected by means of metal ties with each other, and with the lead or zinc roofs, vane spindles and water-pipes, the main point being to secure capacious and good metallic conduction from projecting points of the building to the earth.





CRISTY A. CHURCH
POLK COUNTY, IOWA.

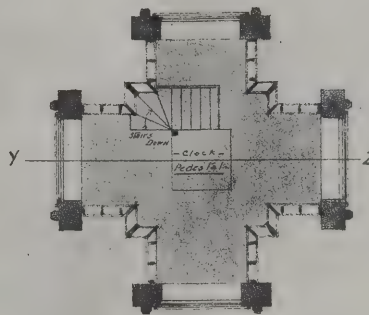
W. G. Roman, Architect.
234 West George Street,
CINCINNATI, O.



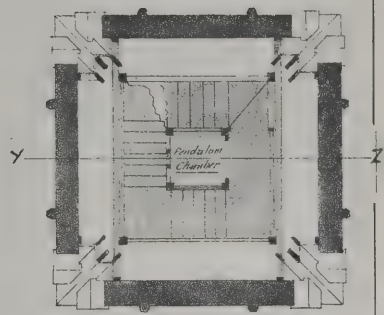
NEW BUSINESS PREMISES, WESTON SUPER MARE *Sydney J. Wilde, Archt.*



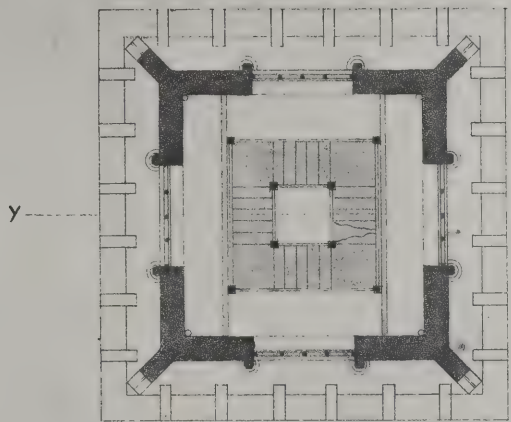
ELEVATION to Fisherton Street
all other elevations correspond without showing door
or puncture to bridge



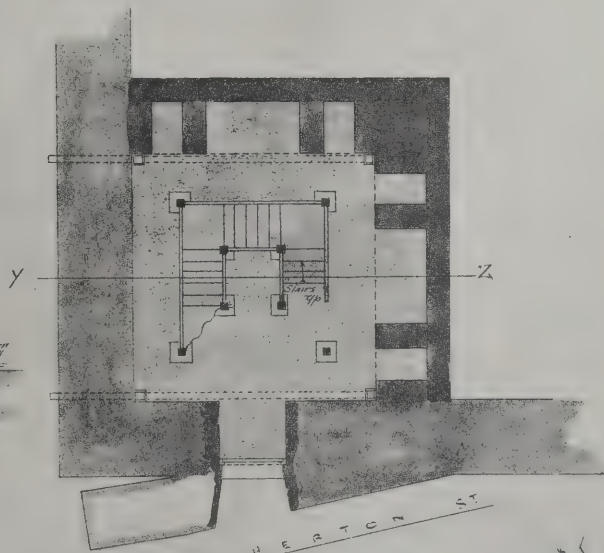
PLAN - LEVEL - D -



PLAN - LEVEL - C -



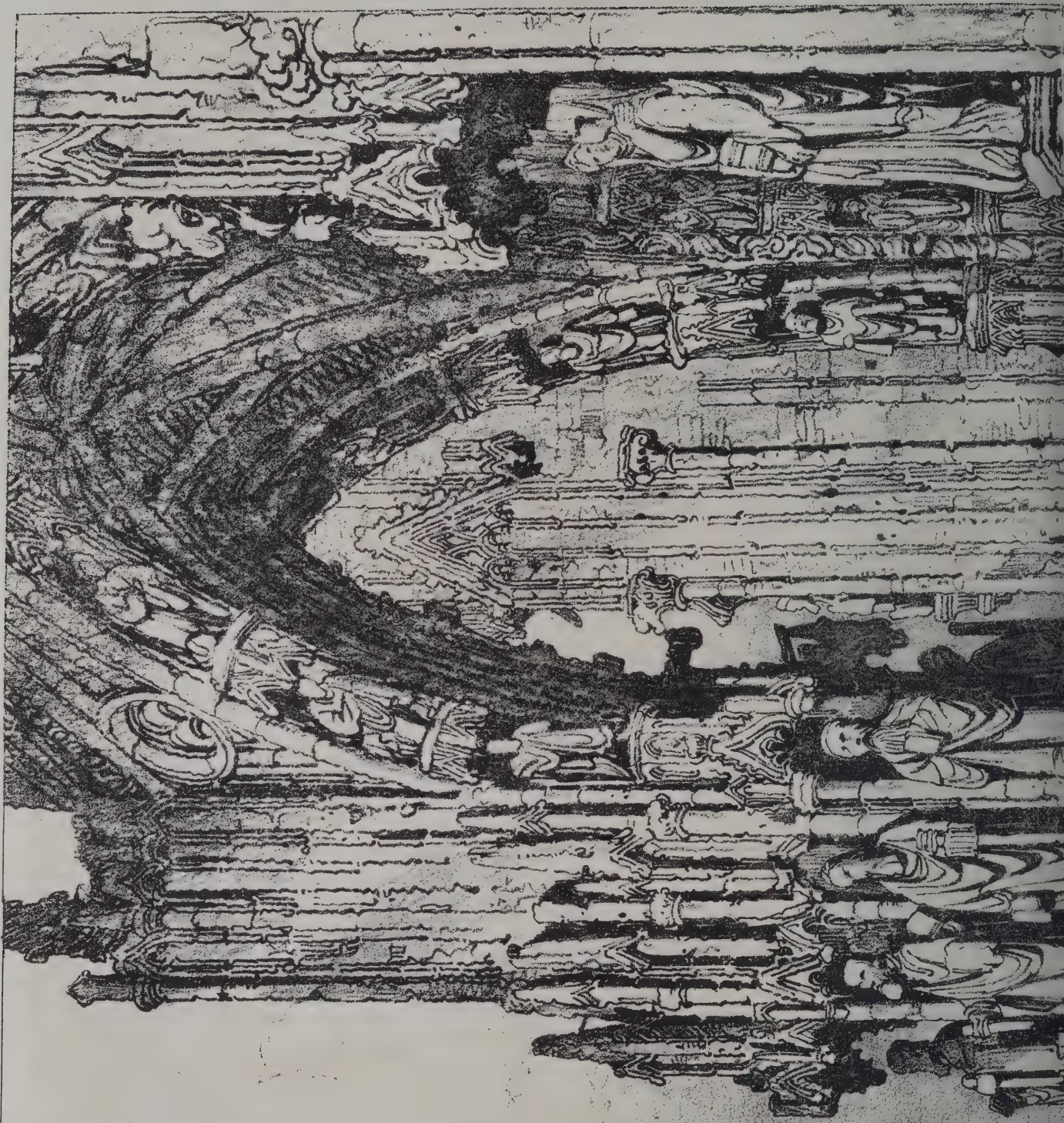
PLAN - LEVEL - B -



PLAN - LEVEL - A -

City of New Sarum. Proposed New Clock Tower.

*John W. Rhodes
Architect*





RATISBONNE
CATHEDRAL

PHOTO-LITHO. SPRAGUE & CO. 4 & 5, EAST HERRING STREET, FETTER LANE, E.C.

CATHEDRAL, RATISBONNE.
Drawn by SAMUEL PROUT.

ILLUSTRATIONS.

TRINITY U.P. CHURCH, POLLOCKSHIELDS, GLASGOW.
MR. W. G. ROWAN, ARCHITECT.

NEW BUSINESS PREMISES, WATERLOO STREET, WESTON-SUPER-MARE.

THESE business premises have recently been erected in Waterloo Street. The facework of building is executed in Corsham Down freestone, the pilasters being of red Mansfield. The brickwork in gables is executed in bricks supplied by Messrs. POULTON & SON, of Reading. The work was executed by Mr. J. WILCOX, local builder, from the designs of Mr. SYDNEY J. WILDE, architect, of Weston-super-Mare.

DESIGN FOR CLOCK TOWER, CITY OF NEW SARUM.

THIS design was submitted in the competition for the new clock tower to be erected partially upon the old town wall, shown in light tint at plan level A. No bell was permitted, and height of illuminated dial restricted. The elevations were to have been in Chilmark stone, coverings in red flat tiles, and aprons, flashings, drips, weathercock, &c., in copper. The design is, by Mr. JOHN W. RHODES, architect, Mitre Court Chambers, E.C.

CATHEDRAL, RATISBON.

PLUMBING.*

By JOHN HONEYMAN, A.R.S.A.

IT is generally interesting, and often instructive, to look back on the course of events which have led up to the existing development of any movement, institution or occupation. The saying is old and trite that "experience teaches fools," and he must be a fool indeed who despises the instruction of such a monitor. Indeed, in this connection—our relation to experience—and in the sense of the word "fool" here intended, which is rather "novice" than "stupid idiot," we may readily admit the truth of Carlyle's doctrine that people are "mostly fools," and even venture to assert that there are no exceptions, for if we sit at the feet of experience till our last hour we shall still find our lesson incomplete. I am in hopes then, gentlemen, that although I may not say much that is new to you to-night, my reference to things of the past may not be unsuggestive, for wisdom is to be drawn from conspicuous failures as well as from conspicuous successes. I think a brief reference to the vicissitudes of sanitary science during the last forty years, and the many changes which have been introduced into plumber-work, can hardly fail to be interesting to such an audience as I have now the honour to address, and I trust it may, in some measure, be useful. I propose to limit my retrospect to a period of about forty years, beginning with the time when, as an embryo architect, I wielded the T square in the office of a gentleman who has long since left us, but who will be remembered by some of you—the late Alexander Munro. Since that period enormous progress has been made in every department of mental and manual activity; but the progress observable in plumber-work during the last half century is not so much in the direction of superior workmanship as in the adaptation of apparatus to new requirements. Sanitary science has dictated many changes in ordinary domestic appliances, which plumbers have—rather tardily, if the truth must be told—recognised to be advantageous, and modified their practice accordingly. The new requirements naturally led to the introduction of new apparatus and to the production of many things by machinery formerly made by hand, and the manufacture of fittings for the use of plumbers has in this way been carried to great perfection, but the plumber trade can hardly claim much credit for progress in this direction. Plumbers, with a few conspicuous exceptions, have not been great inventors. I think I may very safely say that, even in recent times, the most perfect appliances have been known to be associated with very bad plumber-work, while the converse is also true. In the building trades generally there is little room for progress such as we find in other departments of skilled labour. We find as good masonry in our cathedral as we are able to produce now, and I have no doubt the man who "rolled" together the cast sheets of lead on its roof would handle in a tradesmanlike way the soft-milled sheets on a modern platform. But one reason why improvement in plumber-work is not so marked as might be expected is that forty years ago we had remarkably good plumbers here. There has been greater improvement in England than here, but the reason of that is that there was much more room for it. Scottish plumber-work was of a distinctly superior

character, both in design and execution, and the most probable explanation of this, I think, is that the trade here was, as a whole, better educated. It very rarely happened that any lad apprenticed to a skilled trade was illiterate, and both journeymen and masters were well educated. But while forty years have made little change in the character of the plumber's work in Glasgow, they have made a vast change in two respects—(1) the development of the trade; and (2) the diffusion of correct views regarding the methods of securing the best sanitary results, and the responsibility of the plumber in connection with the health of the community.

I think the development of the building trade has more than kept pace with the growth of the city, and there is a keener competition for work now than there used to be. That is certainly the case in my own profession. Some of you will remember all the architects of any standing in the early fifties—there were about 16 altogether, and in the last "Directory" we find no fewer than 138 names. Then in the "Directory" of 1854, one of the first I purchased for my own use, I find that the list of plumbers occupies half a page, 51 names in all, whereas in last year's "Directory" the list occupies eight pages—comprises 378 names—an extraordinary change to occur within the recollection of many who are here present. I am aware that some of these are rather bellhangers and gasfitters than plumbers, but we may safely take the number as over 300. And here I may remark that I have a considerable respect for the old adage, "Let the shoemaker stick to his last." The plumber, strictly speaking, has to do with water only. He has to protect us from the water which comes down from above; he has to supply us conveniently with the waters we daily use, and he has to remove these waters, when used and laden with impurities, as quickly as possible from our dwellings—a large and important function. But to return, when one looks at a list such as this (in the "Directory") he cannot fail to be deeply impressed with the vast importance of the problem, How shall the energies of this great multitude of plumbers be so directed and governed as to insure that they do not work mischief to the public health? For we must remember that it is not merely the masters (whose names appear on these pages) with whom we have to deal, but the greater army of journeymen and apprentices in every shop, who are from day to day in every quarter of the city—in costliest mansions and humblest tenements—doing, according to their lights, either good or evil. Is it not true that many of these, indifferent to the result, are quite content even now to go on doing things by what we call "the rule of thumb?" But there are undoubtedly symptoms that "the rule of thumb" is becoming gradually discredited. This is one of the most encouraging facts connected with the present. The operative plumber has been roused to a sense of the growing comprehensiveness and complexity of his craft, and of the advantage, if not the necessity, of technical education of a wider and, at the same time, a more exact character than sufficed in former years, and it is a most fortunate circumstance that, just as this need becomes felt and pressing, facilities for supplying it increase and encouragements are multiplied. It cannot be questioned, I think, that in this connection the movement set on foot by the Worshipful Company of Plumbers has done notable service, and I trust the day may not be far distant when no respectable plumber will be contented unless his name appears on the official register.

The three things which during the last forty years have done most to stimulate the plumber trade in this district were—the introduction of the Gorbals gravitation water, the introduction of the Loch Katrine water, and the growth of the shipbuilding trade, especially the construction of so many magnificent passenger steamers here, with their luxurious fittings.

Let me refer very briefly to our water-supply. When the Gorbals works were completed nearly fifty years ago, it was becoming evident that it would very soon be necessary to give up the river as a source of supply, and these works conferred a great boon on the inhabitants of the south side, who were so well pleased with their supply that when the Loch Katrine scheme was proposed they resolved to oppose it. The true reason of their opposition, I have no doubt, was that they were afraid of additional water rates, and they thought it unfair that they should be charged for what they did not want. Ultimately things were satisfactorily arranged, and for some years after the introduction of the Loch Katrine water the people on the south side continued to pay a rate of one shilling in the pound, while those on the north side paid from 1s. 2d. to 1s. 4d. In 1865 the rate was equalised at 1s. over all, and in 1871 it was reduced to 8d.

It is a curious fact that the opponents of the Loch Katrine scheme relied chiefly on the contention that the water of the loch was too pure, and that by contact with lead it would become highly poisonous. The late Dr. Penny, of Anderson's College, a well-known analytical chemist, gave evidence to this effect before a parliamentary committee. And I remember seeing some of his specimens, which were certainly well fitted to create alarm—the lead suspended in the Loch Katrine water being greatly oxidised. I don't know exactly how this was got

* A paper on "The Plumber Trade: a Retrospect and a Forecast," read at Glasgow, and reprinted by permission of the Worshipful Company of Plumbers and the West of Scotland District Council.

over, but I suppose some other chemist must have proved that it was of no consequence, and I am not aware that we have any large mortality from lead-poisoning. One thing is certain, that the water was very soon brought into contact with a large quantity of new lead, for not only was it found that the old pipes were unable to stand the new pressure, but the demand for new supplies rapidly increased. Some idea of this may be gathered from the fact that in 1856 the total revenue, with a rate of 1s. 2d., was 62,335*l.*; whereas thirty years afterwards, with a rate of only 8d., the revenue was 162,572*l.*, and a sinking fund of 141,931*l.* had been accumulated.

With reference to the growth of sanitary knowledge, that has been a very slow process. For many years after the introduction of the system of water carriage we were simply groping in the dark. Microbes and bacilli were fortunately unknown in those days, so the bad sanitary arrangements did very little harm. While waterclosets were still comparatively rare, the prevailing idea seems to have been that all the water had to do was to take the soil out of sight; and, in point of fact, much of it never got beyond the built drains and the invariable cesspool, and the river remained uncontaminated. The regular fishing of salmon on the Clyde, just as on the Tay at the present day, is a thing quite within my recollection; often have I watched the whole process at "The fishers' hut," within a mile of Glasgow Bridge. I remember very well when, as a boy, passing up or down in the "steamboat," it was quite a common thing for her to slow or stop altogether several times between Dumbarton and Glasgow while the nets were drawn clear of her course. In those days our supply of water in Glasgow was drawn partly from pump wells, but chiefly from the Clyde, and there was very little plumber-work in our houses. In the country generally there was practically none, and I may almost say that the plumbers, by their improved methods, are responsible for the filthy state of our river now. I used sometimes to live in a nice little cottage at Govan, which stood where the new graving-dock now is. It had a small flower-garden in front and a large garden behind, the gooseberries and pears of which I remember to this day. A narrow road passed in front, and then a beautiful green common sloped down to the towpath along the river, which here took a sharp turn to the north. On this common stood a pump-well, to which the maids and matrons of the village resorted with their "stoups" for their daily supply of water. I need hardly say that in that happy village, where almost every cottage was thatched, there was no need of plumbers, and there was no river-pollution by Govan at least. The cottage I have described being of rather a superior class had a pump-well of its own. This stood close to the back door, with a large semicircular trough in front of it, cut out of freestone, having a grating in the bottom. There was absolutely no other plumber-work about the place, and the same might be said of almost every other house of the class throughout the country at that time. The trough in front of the well was the sink of the establishment, and where the waste water went or how much of it got into the well again I have not the least idea. The water was beautiful to look at, clear and cold, and this much must be said for this old style of thing, that I never heard of a case of zymotic disease being in that house, and the old lady who was there in my boyhood lived there to be over eighty years of age, and her large family grew up to be the fathers and mothers of a generation which has been delivered over to the tender mercies of plumbers. The transition from such a primitive state of matters as I have depicted to the present complex development of domestic plumbing was a very gradual process. The difficulties and dangers involved in the change were not at first understood, although they very soon became apparent. The first difficulty which met the sanitary innovator of the day was the inefficiency of the drains formerly in use for the conveyance of sewage. It was soon discovered that ordinary built drains of brick or rubble were not suitable, although they continued to be used for many years and, I have no doubt, some are in use in Glasgow to the present day. I have seen a built drain which did answer the purpose very well. It was made entirely of hewn stone, with a channelled sole on which the sewage flowed, but such a drain was very costly and beyond the means of most people. The defect of the rough built drains, of course, was that they leaked. The liquid sewage escaped and very often found its way into the wells, which continued to be used, and sometimes were the only source of water-supply long after the introduction of waterclosets; but, notwithstanding this serious defect and the inconvenience it caused—for danger was apparently not taken into account at all—so late as 1860 I saw the drains in the streets of a town not fifty miles from this constructed thus. Rough slabs of the native slaty rock were laid together at the bottom of the trench to form the sole of the drain; along the ends of these were built the rubble sides, and similar rough slabs laid on the top formed the cover. The streets were long and the gradients very slight, and I need hardly say that, in process of time, it was found that these remarkable common sewers had never acted as drains at all, but merely as elongated filtering tanks, in which all solid matter was retained. When

this discovery was made, they were replaced by drains of a different type; but that a body of intelligent men should have done anything so foolish only about thirty years ago is a curious illustration of the slowness with which correct ideas on the subject of drains grew. The invention of glazed fireclay pipes greatly facilitated the construction of good soil-drains at a moderate cost; and although till quite recently far too little attention was paid to the proper pointing of these, it may be fairly said that these fireclay pipes solved the difficulty of the water-carriage of sewage.

The next stage in the progress of domestic sanitation was the growth of the idea that defective drains, and, ultimately, that all drains, were a source of danger to the dwellings to which they were connected. This led to the invention of traps and the abolition of the old built cesspool. The form of trap used for many years (and still manufactured) was the familiar syphon trap with the cleansing eye in the centre. When properly made, it served to cut off the connection between the house and the common sewer—a very important service, and all that was required of it, for the idea of ventilating the drains and sewers had not yet dawned on the sanitary engineer. I was not by any means the first to direct public attention to this subject, but in 1858 I invented and publicly exhibited a trap which greatly facilitated the ventilation both of drain pipes and sewers. Instead of the eye in the centre, it had an eye on each side of the water seal, either of which, or both, might be used for ventilation as might be required. The cleansing eye was on the side next the house, and the surface of water exposed on that side was considerably less than on the other, the run-out of the trap being different from the drop into it. Indeed the various traps now in common use having the eye on the house side of the seal are but very slight modifications of my design, which was probably the first of the kind applicable to drains. It is figured in the first edition of Dr. Parke's well-known work. But here again I must remark that progress in the direction of ventilation was exceedingly slow. For ten years after my lecture and the exhibition of the new trap before the late Mr. Carrick and the principal Glasgow architects and builders of the day, I do not believe a single two-eyed trap was used except by myself. The man who did most to demonstrate the utility and practicability of drain ventilation here was undoubtedly our friend Mr. W. P. Buchan, and that, I may say, brings us down to the present day, when the proper ventilation of all sewage drains and soil pipes is regarded as a *sine qua non*. One of the most important changes made to facilitate ventilation was the carrying up of the soil pipe through the roof and leaving it open. In days of old it ended at the trap of the closet, with the result that the confined gases ate a way through the lead bend and so had free access to the house. The late Dr. Fergus used to have quite a collection of these honeycombed traps, and I have no doubt that many hundreds remain in use now.

I may here say that I think a good deal of the recent progress of plumber-work is due to the existence of our sanitary protection associations. These have been a great means of bringing home to the public the fact that drains may be in a very bad state, although there is no perceptible smell and although landlords and especially landladies protest, as they always do, that the drains are in perfect order. One result of this is that it is becoming customary for tenants to insist upon seeing a certificate from the sanitary engineer before taking a house or even furnished apartments. If this custom became universal it would have a most salutary effect, and make things very lively in the plumbing trade for some time to come.

The admission of air to a house through the drains is on many grounds exceedingly objectionable, but it is undoubtedly of more importance to make the drains and plumber-work water-tight than air-tight. Organic matter must be removed quickly and perfectly without one atom being left behind to ferment or evaporate within the walls. If this is effected and the drain disconnected from the common sewer, the drains are practically innocuous. The relative importance of the two things has been rather lost sight of. The air from drains is a very bad thing, if the drains it comes from are badly ventilated and full of putrefying matter, but in that case it would be a very stupid course to attempt mere palliatives; the right thing to do is to make the drains clean and wholesome. If the sewage of a house were taken across the basement in an open channel it would do no harm to the inmates provided the channel was smooth and impervious and had a good fall. The covering of such a channel is a matter of convenience, not of sanitary necessity. But while air may, in certain circumstances, enter a house from its drains without serious consequences, the other contents of soil drains cannot do so without serious risk. That is the point I wish at present to impress upon you.

You will not understand me to imply that it is of no consequence whether drains are ventilated or not; for even if there be in them no micro-organisms worth speaking about and no germs of specific disease, there are other things which, by universal consent, are held to be deleterious, having an

atonic influence predisposing to certain forms of disease. There is, therefore, no question about the expediency of ventilating drains and sewers; but it will serve no good purpose to exaggerate its importance, for exaggeration is a species of falsehood and is apt to distort our mental vision, causing us to form false estimates of the relative importance of things, and, in point of fact, I have seen cases where the means taken to effect disconnection and ventilation—the multiplicity of Buchan traps and Hart traps and grease traps of one kind and another—seriously interfered with the primary object of all domestic drainage; the immediate washing away of all the organic matter and waste water we commit to the drains. You will, therefore, I dare say, agree with me that on this point a word of warning is not uncalled for. Regarding the matter from the practical point of view, my experience has long since led me to the same opinion which Dr. Carmichael has reached by more scientific methods, namely, that sewer-gases, as they are called, do not, and indeed cannot, originate specific disease. It is true that when typhoid fever or diphtheria has occurred in a house and the drains are tested, they are very often found defective, but they are also sometimes found to be in perfect order; and among the healthy houses you will not find a larger proportion with perfect drains than among the unhealthy houses. In both cases the percentage of defective drainage is exceedingly high even now, and what must it have been thirty years ago? If the air of the drains were laden with pathological germs, none of the last generation could have survived. I have lost faith in the virulence of the healthy bacillus; but, at any rate, it is an ascertained fact (*vide* Dr. Angus Smith at Glasgow Congress of Sanitary Institute of Great Britain; Report of Dr. Dixon's Committee on Air of Glasgow to Philosophical Society; paper by Dr. J. S. Haldane, Transactions of Sanitary Institute, vol. ix. p. 407, &c.) that there are not nearly so many micro-organisms in the air of sewers as in the air of ordinary apartments, or even in the external atmosphere. It would almost seem that the existence of micro-organisms in the sewers is due to the ingress of fresh air, not to the existence of sewage. Upon the whole I am inclined to think that the bacillus is very much maligned. It is in itself a very harmless creature, but "evil communications corrupt good manners." You have often heard of people being killed by the bite of a fly. Well, in cases of that kind the flies may be caught, and they may be identified as belonging to the same species, and if people did not know better, they might conclude that this species of fly possessed the specific virus of anthrax. In the same way you know that a scratch from a sharp steel knife causes little inconvenience; but if the scratch is made by the knife you are using in the dissecting-room the effect is very different. The steel is harmless, yet deadly when in contact with certain poisons. So is it, I venture to think, with the bacillus—at least, this theory seems not to be inconsistent with the results of experience and recent investigation. We may thus charitably believe that if the bacillus, which belongs to that most beneficent order of beings, the scavengers, is sometimes the vehicle of disease, it is only accidentally so. But I must not pursue this subject further here; it is a digression rather beyond the plumber of the past perhaps, but quite within the range of the scientific plumber of the future.

Before concluding this brief reference to present practice I would like to say that I notice one or two things which are still done by plumbers, if left to their own devices, in a way which can hardly be commended. I shall not particularise, as I am not to lecture you in the sense of "blowing you up" to-night, but I may remark that the shortcomings I refer to point to the desirability of the plumber of the future attending some of our classes of building construction, a science for which plumbers often show supreme contempt.

There is another thing which the plumber of the future must know a great deal more about than the plumber of the past, and that is the nature and use of different metals. You have now to use many metals for a variety of purposes, in various combinations and subject to both chemical, mechanical and electrical action, and you must understand these things if you are to do good work intelligently; and allow me to say you will never do work which will yield you any delight in the doing of it if you cannot do it intelligently. I would therefore strongly urge any young men whom I now address to avail themselves of the many facilities which are now within their reach for obtaining this technical knowledge, so that they may rise to the proper level of the modern skilled mechanic. We know not what possibilities connected with the plumber trade lie before you, but this we know, that between the man who blindly labours at his daily task without one thought beyond his daily wage and he who understands his work and delights in it, there is all the difference between a galley-slave and the stroke of an Oxford eight. You may depend upon it, gentlemen, that it is knowledge which truly emancipates, and which alone can lead us to make any sense out of the phrase, or to bring the truth of it home to our individual experience, *Labor ipse volupias*.

I regret that so little time remains for reference to one

important part of my subject—which, however, I must not entirely pass over—namely, the change which has occurred within the period under review in wages and the hours of labour. When I commenced business, the standard wage of a plumber was 23s. 9d. per week, and the hours of labour were 60 per week. In winter the hours were the same on Saturdays as on other days, but in summer the plumber, by working 10½ hours on other days, managed to get away at 2.30 on Saturdays. Now, at the present time, the number of hours of labour per week is only 51, and the week's work ends at one o'clock on Saturdays, and the wages, instead of being (as they would be at the old rate) only 20s., are 34s. There is evidently remarkable progress here; but is it in the right direction? Yes, I think there can be no question about that, and I am sure all here are unanimously of that opinion. Fifty-one hours per week is a very near approach to the ideal eight hours per day. It is a fair amount of work if that work is honestly performed, and yet it leaves a fair margin of leisure. I often wish I had as much myself, especially when sometimes hurrying along just in time to catch a five o'clock train on a Saturday afternoon, I find my way blocked by groups of workmen sauntering along in a very leisurely manner, with the air of men in easy circumstances. And no doubt, as compared with their predecessors, they are in easy circumstances, both in respect of toil and wages, for almost every necessary of life is a great deal cheaper than it was forty years ago. There was no 4 lb. loaf at 5d. in those days, nor sugar at 2d., nor tea at 1s. 9d., nor—may I mention it—any "butterine."

But, gentlemen, I fear we cannot say that the progress of the master plumbers has been quite as satisfactory. There were really wealthy plumbers in the old days, and it was quite possible to make a fortune at the trade; but now profits have greatly diminished, and it is a laborious job to get through enough of work to make a decent living. Now, is this an entirely satisfactory state of matters? That is an extremely interesting question for those interested in the plumber trade. We are not likely to be unanimous here, for the answer must depend on our particular point of view. Some there are who hold that masters as a class should be abolished; others apparently think that they should not be abolished, but only persecuted; while others cling to the old-fashioned idea that, upon the whole, they are still indispensable, and that they ought therefore to be supported and encouraged. To this latter class it must be discouraging to know that the inducements to assume the position of master are becoming year by year less and the deterrents greater, while to the others these facts must be regarded with satisfaction, as among other things indicating the approach of a new era in which the workman shall be master of the situation. It must be admitted that during the last thirty years events have distinctly tended in this direction, and I confess that for myself my sympathies are with those who desire to see the wealth-producer reaping the full reward of his toil, but I have no sympathy whatever with the methods hitherto pursued in furtherance of this object. What I would say to plumbers and to skilled workmen of every kind is this:—While you have masters treat them well, your interests are indissolubly bound up with theirs; but when you see your way to do without them, to manage your own affairs—converting, it may be, quondam employers into employés—then, I say, go forward in a self-reliant, straightforward, manly fashion, scorning to claim privileges while you refuse to accept relative responsibilities.

I cannot help thinking that the bill at present before Parliament for the Registration of Plumbers may facilitate such a revolutionary movement as I have just indicated, giving, as it does, legislative recognition to a great union of men all possessing a certain standard of skill in their trade. Who knows what the functions of District Councils may be thirty years hence? But whatever changes are before us, of this I feel assured, that the great labour problem, which is at present engaging the attention of so many minds, shall never be solved till the working classes recognise the fact that their destinies are in their own hands, if only they have the capacity to shape them by efficient co-operation. There is no other practicable solution of the problem. Be assured that the great socialistic fabric of the future—which so many desire—if it is ever to overshadow our land, must rest on some better foundation than the treacherous quicksand of coercion; it must be the work of free men who can trust each other, and must rest on the solid basis of the immutable precept—"Whatsoever ye would that men should do to you, do ye even so to them."

A Pulpit has just been completed in St. Peter's Church, Peel Causeway. It is octagonal in form, and has been designed to correspond in style with the reredos which was erected last year. It is ascended from the chancel level by three steps, which are protected by a light pierced balustrade. The whole is executed in rich variegated alabaster, and has been made from the designs of Messrs. Tate & Popplewell by Messrs. J. & H. Patteson, Oxford Street, Manchester.

QUEEN ELIZABETH'S BATH.

AN interesting subject for an architectural paper could be found in the history of the transformation by which an odd assemblage of buildings became Trafalgar Square, which so many are pleased to accept as the finest site in Europe. The sketch below represents the interior of one of the buildings which was comprised as part of the King's Mews. It was nearly square in plan, the interior being 13 feet by 12 feet 6 inches, and was constructed of fine red brick. The most interesting part was the massive groining of the roof. The building was commonly known as Queen Elizabeth's Bath.

Scottish Academy, where he had four water-colour drawings hung. One of these was a drawing of the Crown Tower of King's College, Aberdeen. In 1870 he began practice in Elgin, and during the first seven years of his professional career he was the designer of many public buildings, including the City of Glasgow Bank, the restored picturesque old Scottish Town House, and several churches, schools and private residences. In 1877 he became partner with Mr. Matthews, Aberdeen, and took up his residence in the city. He has expressed himself most freely in a robust version of the Renaissance style, broadened a good deal by the almost invariable use in Aberdeen buildings of granite. His designs in the city include those of the Northern Assurance Office, the ornate



QUEEN ELIZABETH'S BATH.

THE NEW ASSOCIATES OF THE SCOTTISH ACADEMY.

AT the special assembly of the Royal Scottish Academy, which was held last week, the following gentlemen were elected Associates:—Messrs. Alex. Marshall Mackenzie, architect, Aberdeen; R. B. Nisbet, painter, Edinburgh; W. Birnie Rhind, sculptor, Edinburgh; John James Burnet, architect, Glasgow; C. G. H. Kinnear, architect, Edinburgh; Alexander Roche, painter, Glasgow; Henry W. Kerr, painter, Edinburgh; John Kinross, architect, Edinburgh; David Robertson, architect, Edinburgh; and J. Coutts Michie, painter, Aberdeen.

The *Scotsman* gives the following biographies of the new Associates:—

Mr. Alexander Marshall Mackenzie is a Morayshire man. He was born in Elgin forty-five years ago, and is the son of the late Mr. Thomas Mackenzie, an architect of recognised talent, whose reputation still lives in the North. Mr. Mackenzie, who is a brother of Sheriff Mackenzie, of Caithness-shire, received his education at Elgin Academy, and afterwards at private classes in Aberdeen. His architectural training was acquired in the office of Mr. James Matthews, who had previously been in partnership with his father, and afterwards with Mr. David Bryce, R.S.A., Edinburgh. While studying in Edinburgh Mr. Mackenzie was an exhibitor in the Royal

Art Gallery Buildings in Schoolhill, the Harbour Offices, the Grand Hotel, additions and alterations to the Palace Hotel, and massive blocks in Union Street and Bridge Street. One of his works outside the county is that of the fine new Elgin Town Hall. Quite recently he prepared designs for the new church at Crathie, and these Mr. Mackenzie had the honour of submitting to the Queen at Balmoral for her Majesty's approval. Among the more recent churches he has designed in or near Aberdeen are those of Craigiebuckler, the Free South, Free Trinity, Free St. Clement's and Ruthrieston Parish. But Mr. Mackenzie's greatest work in Aberdeen is undoubtedly the reconstruction and extension of Marischal College buildings, the scheme for which involves the expenditure of 80,000*l.*

Mr. R. B. Nisbet, who is a native of Edinburgh, commenced life as an apprentice in a Leith shipping office. He took to art in 1879, and went with his brother Pollok to study at Venice. Returning, he joined the Board of Manufactures School, where he studied from the antique and the life. His first exhibits at the Royal Scottish Academy were in oil, but soon he took entirely to water-colour, and now he has altogether relinquished the former medium. In 1885 he went with Mr. P. W. Nicolson to Cromarty, where he first fell in love with bents and sandy dunes. Since then he has sketched mostly at Gullane, St. Andrews, North Berwick, the Fifeshire coast, at Selkirk,

Surrey, and Yorkshire. At Surrey he got his idea for the picture the Chantry Fund purchased in 1890. He first exhibited in the Royal Academy in 1888, in which year he was elected to the Royal Society of British Artists. Last year he was elected to the Royal Institute of Painters in Water-Colours, and he is also a member of the R.S.W. He exhibited at Dresden and Berlin last year, where he gained a diploma, and he has been specially invited to send work to Vienna and Chicago. He leans to the romantic side in his art, but is catholic enough in taste to admire all sides. He owes his style chiefly to strong admiration for the works of De Wint, Cox and Cotman, in water-colour; and Chrome and Constable, along with the Barbizon school, in oil. Some of his principal works are:—*Evening Stillness, Solitude, Harrowing, Forenoon* (purchased, along with many others, by the Royal Association for the Promotion of the Fine Arts in Scotland), and *Sunset on a Border Moor*. Along with Mr. Robert Noble and other members of the committee, he has taken an active part in the formation of the new Society of Scottish Artists.

Mr. Birnie Rhind comes of an artistic family, being the son of the late Mr. John Rhind, A.R.S.A. From his childhood, being constantly amongst his father's work, to follow his parent's footsteps became the natural bent of his early years, and to his father he is indebted for a thorough and comprehensive training as a sculptor. He entered when quite a lad the School of Design, where he studied for several years, afterwards passing four or five years in the R.S.A. Life School. He exhibited first in the annual exhibition of that body in 1877, though it was as a painter for the first two or three years. Since then he has been a regular exhibitor in the sculpture-room. In 1881 he competed with other Scottish sculptors for the statues of the Scott Monument, and was successful in obtaining commissions for four of the leading figures. Later he gained the competitions for the public memorial to the St. Anne's lifeboat disaster, and for the monument to commemorate the raising of the 42nd Regiment at Aberfeldy, and also the first premium in the Chambers statue competition. Like his father, he has made decorative figure sculpture a special study, with the result that, in addition to being associated with the late Mr. Rhind in many of his leading commissions, he executed himself many public works, among them being a large pediment, with Scriptural subject, for the church of St. George's-in-the-Fields, Glasgow; all the figure sculpture on the Charing Cross Buildings in the same city; the colossal group of Britannia over the Academy, Perth; the figure pediment of the Leith Dock Commission offices; the statue of Queen Margaret in the Portrait Gallery; and the pulpit just recently erected in the Episcopal Church, Haddington. Ideal sculpture has also had his attention, as witness his spirited military group, "Tel-el-Kebir," exhibited some years ago, and, in last year's show of the S.S.A., a statue of Burns in marble. In portraiture he has for many years shown good examples, prominent among them being the late Mr. Gibson Thomson. Latterly several of his fellow-artists have been among his sitters. At present he is engaged upon the sculpture for the doorway of the Scottish National Portrait Gallery, which when finished will be a very elaborate piece of work. Several of the models are in the Royal Scottish Academy's Exhibition. The ladies of Edinburgh have entrusted him with the Queen Mary group for the large niche in the east gable of the same building, which they are presenting. He is also engaged on a colossal statue of the Thakore of Gondal, to be erected in the capital of that prince's dominions. Of monumental art he has just completed a mural tablet, with bronze portrait medallion, to mark the burial place of William Drummond, of Hawthornden. The beautiful memorial to the late Lord President Inglis, for St. Giles, designed by Dr. Rowand Anderson, is being executed by him, and for the same architect he is engaged on some sculpture for an important reredos in the west country. In Glasgow, Mr. Rhind is just completing a series of allegorical bas-relief figures in Sauchiehall Street, and the Sun Fire Insurance new offices in Renfield Street are to be decorated with important figure sculptures from his chisel.

Mr. John James Burnet, architect, was born in Glasgow thirty-five years ago, and is a son of the late Mr. John Burnet, a very widely-known architect. The new A.R.S.A. was trained in his father's office in Glasgow, subsequently going to Paris, where he entered the studio of Mr. Pascal. After examination he was admitted to the Ecole des Beaux-Arts, where he gained two medals—one for mathematics, and the other for construction. Returning to Glasgow, he resumed work with his father, and won the competition for the Art Galleries now in Sauchiehall Street. In Glasgow the other public buildings of importance which he has designed are the Clydesdale Bank, the Union Bank, the Clyde Trust Buildings and the Athenæum. In Edinburgh his work may also be seen in the Drumsheugh Baths and the internal reconstruction of the United Presbyterian College, while he also was the author of the design from which the Edinburgh Exhibition of 1886 was erected. In that year Mr. Burnet was elected a member of the Edinburgh

Royal Society. In Gothic work Mr. Burnet was the architect for the Glasgow Barony Church, one of the finest ecclesiastical structures in Scotland, and also two beautiful little churches in Arran. He has taken a great interest in the designing of plans for working-men's dwellings, and his work in this direction may be seen in Rottenrow, Glasgow. His firm at present are also engaged on a Pathological and Bacteriological Institute for the Western Infirmary, Glasgow, and the extension of the Students' Union at Gilmore Hill. Mr. Burnet's firm is known as John Burnet, Son & Campbell.

Mr. C. G. H. Kinnear, 12 Grosvenor Crescent, Edinburgh, partner of the well-known firm of Messrs. Kinnear & Peddie, is one of the leading architects in Scotland. He was a pupil of the late Mr. Bryce, has been in business since the end of 1855, and is the designer of many of our finest mansion-houses, churches and public buildings. For many years Mr. Kinnear has been a most active volunteer, and as colonel of the M.C.A. was on Saturday last the recipient of the volunteer officers' decoration.

Mr. Alexander Roche is an artist who has helped largely in exalting the name of Glasgow in the art world. His paintings are full of the breath of impressionism without the eccentricity which characterises the more advanced apostles of that school of art. He was born in Glasgow, and received his art education principally in Paris under Boulanger, Lefebvre and Gerome. For many years he has exhibited at the Glasgow Institute, the Royal Scottish Academy, the Royal Academy, the English Art Club, the Paris Salon and Munich Exposition. His best works are *The Good King Wenceslaus, Shepherdess, The Hill-top, Miss Loo, Scottish Town, The Clyde, A Pastoral and Off to the North (St. Monans)*. His decorations include a second-class gold medal at Munich in 1891 and honourable mention at the Salon in 1892 for *The Clyde* mentioned above.

Mr. Henry W. Kerr, though a native of Edinburgh, received his early education in Dundee, where also he was apprenticed to a manufacturer on leaving school. Subsequently he entered an office in Leith in order that he might have a better opportunity of attending the arts classes of the Board of Manufactures and the Life School of the Royal Scottish Academy. Water-colour is the medium in which he has always worked, and throughout his career he has exhibited publicly only one oil-painting. He made his first appearance in the annual exhibition of the Academy in 1883, his contribution on that occasion being a small water-colour drawing. It was not, however, till two or three years later that he came prominently into notice with a drawing entitled *A Morning Salutation*, which, after being shown in the Academy galleries, was purchased by Mr. J. L. Toole at the Glasgow International Exhibition. Since then the most important pictures he has painted have been *The Kirk Collection* and *The Loupin-on Stane*, and this year he is represented in the Academy's exhibition by a work of much merit, entitled *St. Patrick's Day in the Morning*. He is specially successful in representing scenes of Irish peasant life, and in rendering in a sympathetic and appreciative spirit the best aspects of the Hibernian character.

Mr. Kinross, though a native of Stirling, has been engaged in architectural work in Edinburgh since the year 1874. For six years after coming to the city he was engaged in the office of the then firm of Messrs. Wardrop & Reid. Subsequently he studied in Italy for some time, and on his return he published a work, "Details from Italian Buildings, chiefly Renaissance." Among the principal buildings which Mr. Kinross has designed are the mansion-house of Thurston, near Dunbar, the property of Mr. Richard Hunter, and St. Peter's Church, Fraserburgh. He has also been engaged in work at Manderston for Sir James Miller, Bart., and at present he has charge of the restoration of Falkland Palace for the Marquis of Bute. Mr. Kinross is in his thirty-seventh year.

Mr. Robertson is a son of a former City Chamberlain of Edinburgh. Among the buildings in the city which he has designed is Morningside United Presbyterian Church; and the John Kerr Memorial United Presbyterian Church in Polwarth Gardens is at present being constructed to his plans. Mr. Robertson also supplied the designs for the alterations on the Greenside parish church.

Mr. J. Coutts Michie has earned his Associateship not less on account of his merits as an artist than for the interest he has always taken in the promotion of art in Aberdeen, where he resides. Recently, largely owing to his exertions, the Aberdeen Art Society, which has now a membership of 400, was resuscitated, and the excellent exhibition which is at present being held in the art galleries promoted. He was also one of the leading spirits in the formation of the Scottish Artists' Society, and by his willingness to help others he has many friends. His artistic studies began at Edinburgh when he was fifteen years of age. He attended the School of Design under Mr. Hodder, gained a gold medal, and at nineteen entered the Academy's Life School, where he gained a scholarship at twenty-two. He subsequently went to Rome to study, and afterwards to Paris. Returning home, his health broke down, and he had to go to Tangier for six or seven years. His health

having been re-established, he has for the past few years been a steady exhibitor at Edinburgh, Glasgow and Aberdeen of portraits and landscapes. Quite recently he has painted on the East Lothian Tyne, and has produced works of great merit—imbued with a fine feeling for colour and pictorial effect. A landscape of much merit was his *Evening*, shown at the S.S.A. Exhibition last August, and now at Aberdeen; and one of the most complete works he has painted is *Autumn Clouds* (No. 91), which is on the line in the present R.S.A. Exhibition. He also shows in the Aberdeen Exhibition an excellent portrait of Lord Granville Gordon—brother of the Marquis of Huntly—and several Lothian landscapes of much beauty. His election will be very popular with the younger artists.

INIGO JONES AND OLD ST. PAUL'S.

THERE is some doubt as to the exact date of the commission for repairing St. Paul's. The work of restoration was, however, active in 1633, and proceeded without interruption till the great civil war. All writers concur in admitting that restoration was necessary, though few would allow that this was done in a way creditable to the genius of the architect. The cathedral, according to the unimpeachable testimony of Wren, was in a sad state of dilapidation and decay; indeed it does not appear that any material addition, or even repair, had been made since the days of Henry III. The houses of London, chiefly in those days composed of wood, and built as suited the fancy or the purse of the proprietors, were huddled close and built high, and the fresh air, the genial sun, and, what was properly worse in the eyes of the architect, a complete view of the church was little thought of. To give scope for improvement and secure a view of the cathedral to the citizens, who probably cared little about it, the removal of a number of houses was recommended, and armed with power Inigo cut away to his new work with less ceremony than many thought decorous. Some were offended at having a fireside, at which they and their ancestors had sat for generations, rudely shovelled away; others were enraged because the shop in which they carried on a lucrative trade was pulled down, and a "compensation" awarded, which they regarded rather as a contemptuous acknowledgment than even an imperfect repayment for the injury sustained; while a third class, and a much more numerous one, saw with no good-will the rebuilding of what all of them termed a steeple house, and, not a few, the "stronghold of Dagon;" the opposing of which they knew also might vex the king, and to add, if any addition could be imagined, to so great a crime as repairing a church, Laud, who was then Bishop of London, laid the first stone.

The demolition of many houses and the restoration of "Powles" were both bitterly remembered afterwards. In 1620, a commission was issued to the Archbishop of Canterbury, the Lord Chancellor, the Lord Mayor, the Lord Privy Seal, and many other distinguished personages, including Inigo Jones, surveyor to His Majesty's works, to inquire what repairs were necessary and what funds existed for carrying them into execution. A second commission was issued on April 10, 1631, in which the name of Inigo Jones does not appear. He was, however, says Britton, employed to superintend and direct the works, which were commenced in April, 1633.

The subscriptions collected for the repair of St. Paul's Cathedral are particularised in large vellum books, which are preserved. Sir William Dugdale has made copious extracts from them for his work. The total amount was 101,330*l.* 4*s.* 8*d.*, whereof only 35,551*l.* 2*s.* 4*d.* had been expended when the flames of civil discord put an end to all further progress in the works. The essential stimulus received, the repairs were begun in 1633; and Inigo Jones began to clear his way by destroying more than twenty houses which were built against the cathedral, with many other encroachments. He paled in the churchyard, and caused the sermons to be preached within the choir, instead of at the cross, for he was directed to begin at the south-east corner and proceed westward. When the architect dug the foundation for his portico, he found the earth in many places loose and unfit to sustain so great a weight. In some parts he turned arches, and in others the ground was rammed 2 feet in depth to remedy those defects. A great deal of old stone from the east end of the church was used in the basement. The pillars consisted of six stones each from the base to the capital, six pieces of ashlar for the lower parts of the columns, weighing 38 tons, and cost 26*s.* per ton. Nine capitals weighed 105 tons, and four architraves 38 tons, at 30*s.* per ton. Among the many other curious particulars, we learn from Malcolm that the carvers of the capital and enrichments had 3*s.* per day. Enoch Wyatt was employed sixteen days on the model of a vast statue for the north side (perhaps the pediment of the transept), for which he received 49*s.* 6*d.*, but it was never used.

The white marble was provided at Genoa by the direction of Sir William Curteine, Knt., and since his time

brought into England and delivered at the Tower Wharf by his son, William Curteine, at his own cost and charges, and by him freely given to be employed in the works of the west end of the cathedral of St. Paul's, in London. Zachary Taylor had 39*s.* 9*d.* for carving the patterns of the enrichments of the great marble door case, and for those of the lesser doors 13*s.* 6*d.*; they were after the designs of Inigo Jones. Nine years ran on in the prosecution of these repairs, and it was in contemplation to rebuild the pillars of the tower to obtain sufficient support for a stone spire. The scaffolds for this purpose were prepared, but the year 1642 produced events inimical to order, religion and domestic peace. All repairs ceased, and the accelerated ruin of St. Paul's commenced. The venerable cathedral became a stable and a barrack for dragoons, for soldiers had broken down the stalls, torn up the stones from the pavement and the monumental brasses from the stones, destroyed the tombs, dug saw-pits in the earth, and divided the spoils with the rending saw. Danger even seemed to have no terrors for these fanatics, who dared to remove the scaffolds and frames which supported the arches of the south transept; how they escaped when the stones fell is almost as wonderful as their folly. Strange as it may appear, while one part of this church was used in this manner, another received congregations for the purpose of praying and preaching; this was the east end and a part of the choir, separated by a brick wall; the congregation entered through one of the north windows converted to a door. The portico erected after a design of Inigo Jones met with treatment equally injurious, but profitable to the usurping inmates. Shops were built within it, and commodities sold by the tenants of every description. But that the monarchs who had endeavoured to restore St. Paul's might not behold those sacrilegious intrusions, even by their marble proxies on the balustrade, they were thrown down and demolished. In sad and sober prose, during the usurpation, the stately portico with the beautiful Corinthian pilasters being converted into shops for seamstresses and other trades, with lofts and stairs ascending thereto, the statues had been despitely thrown down and broken in pieces.

In the year 1639, Inigo Jones completed his repairs, including the beautiful though misapplied portico at the west end, which consisted of eight well-proportioned columns, those at the flanks being coupled with square insulated antæ. If the architect had taken the ancient design for a model he would have saved his memory much reproach. Unhappily, he aimed at improvement, and the consequence was a grand Corinthian portico, placed before a heterogeneous mass, plainer even than the Tuscan order. Jones made no alteration in the choir of St. Paul's; but in other parts, says Walpole, he made two capital faults: he first renewed the sides with very bad Gothic, and then added a Roman portico, magnificent and beautiful indeed, but which had no affinity with the ancient parts that remained, and made his own Gothic appear ten times heavier. Of this splendid mistake, this Grecian portico to a Gothic structure, there is a ground plan and elevation to scale in Kent's "Designs by Jones." The entire west front measures 161 feet long, and 162 feet from the ground to the top of the cross or tower, at each angle rises 140 feet, while over these ascends the central peak ornamented with pinnacles terminating in a cross and forming a screen to the end of the main roof of the building. The whole of this front is of the Corinthian order rusticated, and may be described as cumbrous in form but picturesque in effect. It is far otherwise with that noble portico to which the work described serves at once as a background and a contrast. This reaches in length 120 feet over the bases of the columns and rises 66 feet, measuring from the first step, of which there are five to the summit of the balustrade. There is no pediment, inasmuch as the picturesque rusticated peak performs in some degree the part of a pediment rising nearly 100 feet above the balustrade. There are in all fourteen fluted columns, of which eight stand in front and three on either side; nor are these last crowded, for the projection measures 42 feet. At each angle there is a square pilaster, proportioned and diminished, like its circular companions, with half pilasters to correspond where the portico unites with the wall. On the front line and on the return of these pilasters a column stands so close that the capitals and bases are all but touching; in the centre of the portico the space between the columns measures only 11 feet, while that which separates the others is only 9, thus giving air and access to the principal door. The columns including capitals and vases measure 46 feet high; on the parapet corresponding with each column a pedestal is inserted breaking forward and rising 9 inches above the cornice, serving at once as a blocking to the balusters and a support to a statue, of which the architect had designed ten, all princes and benefactors of the church. It was said there was nothing in this country so nobly proportioned and so simply splendid as this portico. The pilasters coupled to columns at each corner varied the sameness of the design and preserved the perpendicular profile of the angles, which the square projections above and below seemed to require, and which circular columns sacrifice.

BUILDERS' PLANS.

THE architects in the southern states of America have been protesting against the practice of erecting houses from plans which were prepared by builders. Mr. M. J. Dimmock, of Richmond, Virginia, in a paper on the subject says:—

The southern states in the past were strictly an agricultural district, and consequently the cities were few and the plantations large, and there was little which led to the study of architecture, and the buildings partook more of the practical than the artistic in design. There were public buildings and many planters' houses which were admirable in design and were planned to suit the wants and requirements of the day and climate, and some of these are to-day worthy of study.

But a new condition of affairs now exists, and the new South has become manufacturing as well as agricultural, and as a consequence her cities are growing and new towns have sprung into existence, and so new architectural conditions are required. The resources of the South are being rapidly developed, and capital from home and abroad is seeking investment. Great business schemes are projected, and it is a recognised fact that after maturing a scheme when the planning and erection of buildings is necessary, the first thing to be done by the projectors is to secure the professional services of an architect, one in whom all confidence is reposed, to advise with and prepare the plan, &c., of a building which shall fill all the requirements of the special scheme, not only as to arrangement of plan, but also as to appropriateness and beauty of design, and which shall not fall short, but surpass if possible, other buildings of a similar character. This is a recognised business procedure, and the only proper mode of carrying out the scheme in hand. Now to find this architect and adviser one must first look for an educated man in his profession, and one who has had experience in all matters pertaining thereto, and is able to study and solve the problem given him in a careful and businesslike manner in all its details, and the architect, to do this, must have years of study and long experience and a certain aptness for his profession, coupled with decision of character and a gentlemanly bearing, which are all necessary for success.

These qualifications it would be unreasonable to expect in a builder who has neither had the time nor means of study, and whose early manhood has been spent in the details of probably but one branch of the carpenter's trade. These men have, in some instances, familiarised themselves with a few plans and specifications prepared by architects, and have finally essayed the practice of architecture; and in most cases the community loses a good builder and gains a person too large in his own estimation for the honourable trade, and yet greatly too small for the profession he calls "Architecturing."

The trade of a builder is a most honourable one, and carries with it great responsibilities; and its emoluments are always satisfactory and often large; and there is always room in any community for a good builder while there should be no room for a pretender.

It would be impossible in this paper to enter into a criticism of the drawings furnished by builders, and to follow them up and examine the buildings erected from them; but suffice it to say, they are in almost every case crude, raw and undigested, and even to the uneducated eye there is something that stamps them as builders' drawings, and the house erected from them is neither in design a thing of beauty, nor in plan a joy for ever.

The question is how shall we seek to remedy this evil? The fault lay not at the door of the builder; for he, in making these so-called architectural designs, is but supplying a demand of the public, the masses who are too often ignorant and careless in all matters of architecture, and who, thinking to save the professional fee, will expend often twice the amount of this fee in patching up mistakes in faulty plans and specifications, and inflict on the community a Dolly Varden monstrosity.

We can only hope for an improvement by the gradual education of the public to a higher standard in architecture. That this standard is improving there is little doubt; and here in the South-land, which we all love so well, and in whose development we are peculiarly interested, there is a growing demand for better things, and the public is discriminating between good and bad architecture. This is the age of travel and observation, and much is learned by comparison. Art is now diffusing itself into everything, and this is seen in the simplest forms of household decoration; and the child of to-day is surrounded and educated by artistic objects that were not thought of in our boyhood days.

And so it behoves us now, one and all, to strive for this end, and with unceasing study and the careful preparation of every detail of design, both in small as in large buildings, to improve the architecture of the South, and to place it on a level with that of any other part of this land. Nature has been most

bountiful and the resources of our country are unlimited, and we desire the traveller in the future to pause and admire and study our architecture as well as our history.



Edinburgh Revisited.

SIR,—It is a strange feeling which is excited when one revisits, after a lapse of time, a city that once was familiar. Edinburgh is particularly adapted to move an architect when he renews acquaintance with it. Blessed with the finest sites in the world for building, and blessed with a liberal choice of the best stone for doing it, Edinburgh should stand first of all cities in the world for a magnificent display of architecture. Unhappily it does not. This regrettable fact may be owing partly to the lack of funds, or to that spirit of rigorous economy which seems to be inherent to the Scottish character, or to other causes.

The castle, the most prominent site, may be taken first. The more ancient portions to the south and east have been allowed to fall into lamentable decay, the whole skyline being now flattened down to a dreary stretch of slated roofs, without one redeeming feature to help it, and most of the ornamental details of the building itself being ruthlessly cut away in later alterations. A new block was erected at the north-east angle of this part about the year 1600 in the characteristic style of the period, but even here the roofs of the turrets have gone, and no effort has been made to restore them. What was done to the buildings generally in the past century has been of a contemptibly utilitarian character, as witness the factory-like block of barracks to the west, whilst the centre building in later years was recast by Mr. Billings in a "neither fish, flesh nor good red herring" style, quite unworthy of the author of the noble work on "Scottish Baronial Architecture." Of the modern buildings lately added to the castle, such as the principal gateway, all that can be said is that they might be worse, and, considering their official birth, they are fairly good of their kind.

It was left to a patriotic publisher of Edinburgh, the late Mr. Nelson (all honour to his memory), to bring back in a measure the ancient glories of the castle. He has restored the inner gate which stands prominently forward on the north. We have little left of ancient Scottish work of this sort to guide us in judging of the merits of the design, but it appears to be at least of good, vigorous and picturesque Mediæval character, and certainly shows well on that side of the castle. The gatehouse is in the form of a tower, the roadway passing through the lower portion, which has the usual vaulted archway, portcullis, &c., built by the Regent Morton. The top portion has now been restored with corbelled parapets and gabled gatehouse, this latter having two picturesque turrets corbelled out on the north side. It is perhaps unfortunate that the architect has faced this top portion with a tidy ashlar veneer, in startling contrast to the ancient substructure, which is of very coarse rubble-work, without even a string-course to break the continuity.

The old Parliament Hall has been also completely restored at Mr. Nelson's expense. The floors, which for 140 years cut the building up into hospital wards, have been removed, the fine old open timber roof exposed and restored, and the whole inside of the hall entirely overhauled and adorned with good wall panelling, covered with coats-of-arms and other appropriate ornament of a presumably Scottish character, and the great fireplace carried out after the manner usual in old Scottish castles.

For the rest this unequalled site is little better than a rough hill top. Where Mons Meg—Scotland's big gun—reposes the rock crops up in somewhat dangerous abruptness, much as it was left after the volcanic action which gave it birth thousands of years ago. The parapet in front of the old cannon is so low as to become dangerous, and is at best a mere commonplace wall without any effect. The adjoining chapel of St. Margaret's remains as to exterior as it was desecrated years ago by being turned into a gunpowder store; inside however it has been restored fairly enough, but in place of altar and suitable adjuncts one finds in possession a female vendor of photographs and guide-books, who cries her wares in rasping and unmelodious Doric. A great iron water-tank ramps up on the highest point of the rock in hideous utilitarian nakedness, whilst for a few pounds a stone tower of suitable character might be built round it, making an admirable finish to the whole surroundings. A plentiful growth of rank grass and weeds flourishing at its base, with a liberal distribution of sandwich wrappers and paper "pokes" whirling in the blast, make as dismal and as ill-kempt a termination as can well be conceived to the summit of the Royal Castle of Edinburgh.

Modern Gothic church architecture is still in a rather backward state in Scotland. Owing to the poverty of the Episcopal Church there are few efforts which will bear comparison with the enormous amount of church work in England. Of the churches of other denominations—notably the United Presbyterian—there is not much to be said. Even the vaunted General Assembly Hall woefully lacks the true ring of Gothic. It is stated by a reverend gentleman in a late book on St. Andrews that this semi-hall and church was designed by Pugin, but as the same divine also talks about the north transept of St. Andrews Cathedral looking down the South Street, which runs west to east, the statement must be taken with caution.

It is to old work we must look if we wish to study the Mediæval art of the North. No better restoration (in the truest meaning of the word) has yet been carried out than that of the old church of St. Giles. The architect has done what he had to do with admirable judgment, uncovering and judiciously patching up where needed, and generally doing enough and no more.

The whole inside was, up to late years, cut up into several different churches, all of which have now been cleared away, leaving the whole building displayed from west to east, with its side aisles and numerous quaint chapels, which show much that is both graceful and curious in various patterns of vaulting, quaint carving and picturesque detail generally. The exterior of the church went through a terrible handling by the late Mr. Burn many years ago, and was left by him a polished ashlar Batty-Langley abomination, with all its antiquity wrenched out of it, and save for the imperial-crowned spire, which happily escaped his ruthless touch, the church outside might be a building of, say, sixty years ago. Whilst giving the architect of the late restorations all the credit he merits, it must be added that much is to be desired in the new portions which he has inserted of a paltry character; they are quite out of keeping with the sturdiness of the old work. This is notably seen in the screen across the north transept, which is of a cold slatey-blue stone, the details of which are too ornate, and the openings are filled in with plate-glass. It is to be regretted that the architect did not follow the existing details of the old screen; ample remains, if I mistake not, being still to be seen. The pulpit, too, is carried out in a similar ornate style, as also the west porch, which is terminated with three insignificant pediments, filled in with rows of miserably little and intensely modern figures of Scottish kings and provincial saints, all carved in a cast-iron manner, emulating the metal-work on the adjacent monument to the Duke of Buccleuch. Most of the windows have been filled in with painted-glass, in which a dark brown colour unpleasantly predominates. It seems as if the designer, in his anxiety to avoid the garishness of the Glasgow cathedral glass, had run into the opposite extreme of almost obscuring the whole colour in this unhappy manner. He might have done something to impart an effect of breadth to the mullions and other window divisions, which in the Burn spoliation had been thinned down by at least a third of their former thickness. The great west window shows a wonderful row of prophets, priests and kings, standing at attention in massive line, displaying butcher-like biceps, with great flowing beards, red and unkempt; and were it not for their orthodox raiment they might be taken for a posse of gillies fresh from the mountains further north. A monument of very graceful Jacobean has been lately erected to the memory of the great Earl of Montrose, but with Scotch exactitude it has been pushed up into a small and dark chapel—his reputed burying-place—where its beautiful details cannot be properly appreciated. One would have thought that a site in the adjacent south aisle would have been sufficiently near to the traditional “lair” of the murdered patriot to have satisfied even a Caledonian vestry.

Of the new buildings the University schools take the first rank. They are of an Italianesque design, well planned and quite unlike anything else in the town, or indeed in Great Britain. The work is full of delicate and good carved details, intermixed with solid and substantial wall-spaces, but the outline is not as picturesque as was desirable. The new dome upon the College buildings is uninteresting. The building for the National Portrait Gallery in Queen Street is in a mixture of French and Venetian Gothic, clever and picturesque in design, but rising as it does sheer out of the pavement its architectural effect is marred. It has bold corbelled corner turrets and good details, but the inside seems strangely dark for the professed purposes of the building.

Mr. Sidney Mitchell shares with Dr. Anderson the architectural honours of the North. He is a very truthful exponent of the national style in which corbelled turrets, circular stair towers and crow steps are so conspicuous and picturesque features, and some buildings which he has carried out in the village of the Water of Leith do him and the style much credit, which is more than can be said of most of the modern Scotch baronial work in the North. He has lately rebuilt the Market Cross, but it is to be regretted that he has stuck so

faithfully to the original design, handed down by poor engravings, which are bald and uninteresting.

St. John's and St. Paul's Episcopal Churches have been enlarged, and in both the original details have been reproduced with a fidelity that is too faithful. The cathedral of the Scottish Episcopal Church is the best specimen of modern Gothic in Edinburgh. It stands, unhappily, at the end of one of the gloomiest and most depressingly Classic streets in the town. The cathedral, which is unfinished, is from the designs of Sir Gilbert Scott, and is not to be compared even to many of his less ambitious works, either in point of design or elegance of execution. The central tower is stumpy and heavy, and there is a want of picturesqueness everywhere. As to the acres of new streets, squares and crescents which have been in latter years built in the west end of the town, little need be said. One can only regret the chances that have been thrown away of making this newer town a thing of real beauty, worthy of a country where such advantages have been so profusely provided. The one prevailing idea is bow windows, which multiply themselves interminably in wearisome persistency. What a contrast they offer to the beautiful buildings on the Cadogan estate and other parts of London.—Yours obediently,
SCOTUS.

Impney, Droitwich.

SIR,—With reference to the illustration of Impney, Droitwich, in your last issue, I shall be obliged if you will inform me *what additions by Mr. J. R. Nicholls, architect, are shown in the phototype?* There is absolutely nothing there but that which was carried out twelve years ago by M. Tronquois, of Paris, and myself.—I am, yours obediently,
R. PHENÉ SPIERS.

Carlton Chambers, 12 Regent Street:

April 1.

[The additions referred to are mainly confined to the interior.—ED.]

GENERAL.

The Paris Municipality have unanimously decided that the Exhibition of 1900 is to be held in the Champ de Mars.

Mr. John Bartholomew, of Edinburgh, many of whose maps and plans were works of art, died in London on March 31. He was born in 1831, and received his first instruction in cartography from his father.

A Fine Art and Industrial Exhibition was opened at Redditch on Monday, in the expectation that sufficient money would be obtained to pay off the small debt on the local art school.

The Bradford Historical and Antiquarian Society have arranged to pay a visit to Kirkstall and Adel in the following month of May.

Mr. Henry Ough, of the firm of Henry Ough & Son, of 84 St. Paul's Churchyard, E.C., has been appointed one of the diocesan surveyors of St. Albans diocese, under the Ecclesiastical Dilapidations Act, 1871.

Messrs. New & Son, of 62 George Street, Portman Square, have been engaged by the guardians of Paddington parish to prepare plans for a new kitchen and lunacy wards at the workhouse in the Harrow Road.

The Restoration of the west front of Rochester Cathedral, under the direction of the cathedral architect, Mr. J. L. Pearson, R.A., is estimated to cost between 6,000*l.* and 7,000*l.*

Mr. H. F. Gullan will read a paper entitled “The Limestone Bed and Road-cutting in Northamptonshire” at the meeting of the Liverpool Architectural Society, on Monday, April 10.

The Competition Designs for new offices for the County Council of the West Riding of Yorkshire will be on view at the Corn Exchange, Wakefield, on Wednesday next, 12th inst., for the Press at 2 o'clock and for the general public from 3 to 5 o'clock.

In the Competition for the new orphanage for the British Columbia Protestant Orphans' Home, Mr. Thomas Hooper has been placed first. Mr. Hooper will carry out the work, the second and third competitors, Mr. T. C. Forby and Messrs. Soule & Day receiving premiums of 100*l.* and 50*l.* respectively. Thirteen sets of plans, based on sketches and suggestions furnished to the committee by Mr. R. Owen Allsop, were received. Mr. R. M. Fripp, F.R.I.B.A., assisted the committee in the selection of the plans. Tenders will be at once invited for the work according to the plans of the successful competitor. The new building will be a great boon to Victoria, where the present accommodation for orphans is very limited.

Mr. Lewis F. Day will deliver a lecture entitled “Some Masters of Ornament” (Cantor lecture) at the meeting of the Society of Arts, on Monday, the 10th inst.

The Architect.

THE WEEK.

THE majority of the London County Council were so satisfied with their own wisdom and the strong hold they thought they had on the affections of Londoners that they despised warnings from whatever side they came. The late defeat of the Progressive candidate for election at Clapham ought to instruct them of what will be their fate at the next general election of members for the County Council. The public, no doubt, are unwilling to cashier their representatives without giving them time to show whether they will correct errors of judgment or not. A more significant hint than usual has now been given to the Council, leaving them a choice of two alternatives, viz. to amend their ways or prepare to be in the minority at the next elections.

It is little less than ominous that simultaneously with the hint thus given to the County Council an announcement is published that for purposes of revenue the rateage in the pound is to be increased, with the prospect of being still further increased in succeeding years. The abolition of the coal and wine dues was considered a master stroke of policy. Outside the Council, however, it is now generally known as having injured Londoners without the slightest return as a set off. It may be added that coals have been dearer, and wine not a penny a bottle the cheaper since. We think that candidates for election for the next Council could not do better than undertake to, if possible, re-establish this source of revenue, which has paid for so vast improvements in the past and at the same time has not been felt either by coal and wine merchants or coal and wine consumers.

ON Wednesday there was a meeting of the County Council of the West Riding of Yorkshire, when the awarding of premiums for designs for the new county offices at Wakefield was considered. The chairman of the General Purposes Committee proposed that the first prize of 200*l.* should be given to the authors of plans No. 3 (Messrs. GIBSON & RUSSELL, Little Queen Street, Westminster); that the second prize of 100*l.* be given to the authors of plans No. 19 (Messrs. COCKSEY & COX, Craven Street, Strand, London), and the third prize of 50*l.*, to the authors of plans No. 28 (Messrs. SIMPSON & RICHARDSON, of Wakefield). The proposal was adopted. It was stated that none of the selected designs could be carried out for 42,000*l.* The estimates of the competitors varied from 38,000*l.* to 130,000*l.* It was proposed to communicate with the authors of the first design, and obtain if possible some modifications in order to reduce the estimates, which, it is understood, amounted to 64,000*l.* The *Leeds Mercury* says that the opinion was almost universal that the plans of Messrs. GIBSON & RUSSELL, which have taken the first prize, were the most satisfactory. The various elevations are striking, attractive and ornamental, but the great charm lies in the manner in which the building has been planned. Speaking of the design generally, it may be said to be in the Victorian Renaissance style—thoroughly modern. The disposal of the various offices required has been carried out on the corridor principle, which may be somewhat old-fashioned, but which nevertheless possesses many advantages.

It will be absurd for Corporations to expect that they can obtain efficient teachers of technical subjects for the wages of copying-clerks. On Wednesday the Technical Instruction Committee of the Manchester City Council proposed that the following teachers should obtain an increase of salary:—Mr. H. G. JORDAN, chief lecturer on engineering, from 300*l.* to 350*l.* per annum; Mr. T. W. FOX, chief lecturer on textiles, from 250*l.* to 300*l.* per annum; Mr. R. TRAINOR, instructor in woodworking, from 200*l.* to 225*l.* per annum; Mr. W. H. DAVIES, practical instructor in engineering, from 185*l.* to 200*l.* per annum; and Mr. S. JOYCE, second lecturer on electrical engineering, from 150*l.* to 200*l.* per annum. The salaries are not extrava-

gant for gentlemen who occupy onerous positions, but no less than twenty-three members of the Corporation opposed the proposals. Fortunately there were thirty-nine members who were in favour of the increase, and it was sanctioned. It is quite possible to obtain plenty of teachers bearing the South Kensington stamp who are not worth a hundred a year, but Manchester cannot be eager to have its students bewildered by such men.

WARS and rumours of war have lately been the order of the day in the industrial world. The trade dispute in America, which would have militated against the interests of the world's exhibitors at the forthcoming show at Chicago, has fortunately been averted. In Australia difficulties have arisen in regard of one of the most important of the staple trades. In England we cannot boast that we are free from trouble. Any person who has taken the opportunity to glance over the information given in our daily newspapers of what is occurring in all parts of the world must be now aware that it is easier to paralyse trade and industry than to better the condition of working men. Trades unions arose ostensibly to secure that justice was done to operatives without infringing the rights of employers. Unfortunately too many of those charged with conducting the work of trades unions and like associations are not logicians, and they have not advanced the interests of those they thought they were promoting. The result, that they have secured a competency for themselves, cannot be considered satisfactory, when it has been earned at the expense of the operatives and masters alike. We are not without hopes that these evils are beginning to be realised, and that in due time a more rational and beneficial course will be adopted by those interested, or who suppose they are interested, in promoting the welfare of the working classes. If more wisdom does not guide the advisers of operatives, it will be only a question of time, for in the end business and capital will be driven out of the country; but then also will come an end to the business of these speculative traders on their own fellows. So far they have only succeeded in verifying the old fable, that those who kill the goose can expect no more golden eggs.

A SOCIETY has been formed under the title of "The National Society for Checking Abuses of Public Advertising." The objects of the Society, however, do not aim at preventing advertising, as it is generally understood. Whatever the profession or trade persons may have adopted, those engaged in the same never are supposed to "talk shop" out of business hours—at any rate, it is bad taste, according to unwritten laws, to do so. There is no doubt that it was most needful that some steps should be taken in order to prevent an intrusion which threatens to deprive business people of the chance of forgetting business and "the shop" in their time of leisure, and while endeavouring to enjoy a holiday in country scenes. The whole interest of some beautiful natural scenery is too often now marred by huge advertising boards, recalling to the mind of the business man that it is pills that he requires rather than the beauties of nature. A most influential body of men have already joined the Society as members, and among them will be found the names of eminent architects, artists, and other professions. We wish the Society all success.

A COLLECTION of reproductions of chimneypieces that were manufactured by Mr. F. A. FAWKES, of Chelmsford, has been published by Mr. BATSFORD. Like all the work that comes from Mr. FAWKES'S workshops, the chimneypieces are refined in style, and the details will bear the keenest scrutiny. They are specially adapted for the style of building which is now in favour, and it may be said that some of the chimneypieces will sustain a comparison with the best work of the eighteenth century.

THE following jurors have been elected for the section of architecture in this year's Salon:—MM. COQUART, 119 votes; PASCAL, 115; GARNIER, 114; GUADET, 104; MAYEUX, 102; GINAIN, 97; LOVIOT, 93; VAUDREMER, 86; RAULIN, 83; DAUMET, 78; CORROYER, 68; LALOUX, 64. Supplementary members:—MM. NORMAND, 55 votes; GUILLAUME, 54.

DERBYSHIRE, DEVONSHIRE AND DORSETSHIRE.*

IN our time country folks find everyday life is too serious an affair to be neglected, and in consequence the race of village and district archæologists is dying out. The few who still survive are likely to be finished off by parish councils and other newly-devised institutions. It is with a sort of envy we look back to the Arcadian days when simple people awoke to the interest of the "curiosities" in their villages, and lost no time in communicating their discoveries to the *Gentleman's Magazine* and other respectable repositories of erudition. Men were then easily pleased, and anybody who was lucky in finding a coin or an old shoe, or who was able to point to a feature in his parish church as an illustration of somebody's communication in a previous number, might well feel that since he was adding to the stock of their information he was a benefactor of the public. It is a pleasant task, therefore, to have to go through the pages in which Mr. GOMME has enshrined the most characteristic of one class of these old communications. They are all inspired by the simplest and honestest desire to do something toward sustaining an interest in the relics of the past. The writers may not have been scientific or systematic, but even when they are incorrect we must forgive them on account of their good-will towards antiquity. Their acceptance of improbabilities testifies to the simplicity of their belief in other matters.

The three counties which are treated in the latest volume are Derbyshire, Devonshire and Dorsetshire. The first has had to grow with the times, and has become as modern as most of its neighbours. But the Devonshire and Dorsetshire of to-day, if they have lost the rusticity of the last century and of the early part of the nineteenth, are still admittedly behind the rest of England in many things. If the inhabitants of the two counties could be induced to take some interest in archæological subjects their communications would not be unlike those which were received by Mr. URBAN many years ago. As the contents of the volumes are necessarily disconnected, we fear our notice must assume a similar character.

Derbyshire has famous houses, and among the most remarkable is Chatsworth, which is also the costliest to uphold. It appears from one of the communications that the waterworks were originally constructed by GUILLET, a Frenchman, in 1690, and it was probably a desire to outdo them which inspired PAXTON when he planned the Sydenham fountains. The hall of Kedleston House, designed by the Brothers ADAM about 1765, contains "twenty Corinthian columns of veined alabaster, 25 feet high, brought from Lord CURZON's quarries at Red Hill, in Nottinghamshire." Haddon Hall in 1794 was in a very ruinous condition, nobody inhabiting it. A correspondent, in sending a sketch of Hardwicke Hall, expresses the character of the building briefly:—"Hardwicke was built in the reign of Queen ELIZABETH, and possesses all the features of sublimity that we attach to the fanciful and well-painted edifices of our best romances." Another correspondent, writing in 1792, takes a philosophic view of the incongruities which were then common in church architecture. Describing Mackworth Church, he says, "We could observe a very handsome chancel, lately repaired and decorated by Grecian architecture; a little *malà propos*, you will allow, connected with a light Gothic window. However, it is better so than damp, ragged and unwholesome, as too many village churches are." As late as 1822 there stood between Ashbourne and Derby a chapel of the Established Church known as "Halter Devil Chapel." The belief was that a man named BROWN "went to catch his horse, when he by some means caught the devil, who broke loose and vanished in a flash of fire." To commemorate his escape, BROWN built the chapel, and endowed it with property worth 12*l.* a year. An inscription on the church recorded its origin. The twisted spire of Chesterfield Church does not appear to have caused much inquiry into its cause. One correspondent says of it:—"The spire is of timber, and, from a strange fancy of the architect, crooked; the angular flutings,

if I may be allowed the term, wind spirally from the base to the top, and are covered with lead." The old monuments in the church were neglected. We read of one that "has been covered with undisturbed dust, mats and pews for many years, except at distant intervals; the curious traveller or hardy antiquary thrusts his adventurous face close upon it, in defiance of kneeling cushions, ragged boards and crooked nails." Insult was added to injury on one mailed figure, for "the person's head appears to have been shot off entirely from the mouth upwards, and the helmet replaced lightly on the remaining part." Another correspondent who endeavoured to suggest the character of the mutilated figure wrote:—"Surely no artist could have erred so egregiously as to have replaced a broken head in a manner so totally out of nature. As some chiselling was necessary to fit on the new one, what could have been his motive for leaving the old chin? Possibly some modern restorer, imitating his predecessor, may furnish him with a pair of old feet in place of the absent hands." So weird and unpleasant an appearance could hardly be the result of accident, and probably was the practical joke of some unprincipled stonecutter. Another instance may be cited. A Mr. MALCOLM, writing in 1794 about Shirland Church, refers to a figure that was placed under an "uncommonly elegant Gothic arch." This monument, he says, "is another instance of the abominable license permitted to clowns in country churches. One would almost suppose that this unfortunate knight had been mistaken for the decayed representation of their tutelar saint; they have so carefully picked him to pieces, supposing his fragments to possess supernatural qualities." A short time before the correspondent wrote, a large beam fell down over the singing gallery in Shirland Church; it should have come in contact with the vandals, or rather with the officers, of the church who tolerated the mischief.

In Devonshire, also, orthodoxy was enabled to assert its earnestness by destroying ancient work, with at least the tolerance, if not the approval, of the clergy and churchwardens. One of the correspondents of Mr. URBAN, in a tone of sorrow and anger, writes:—"Elsewhere the hand of depredation and destruction only partially fixes its hateful impress on the works of ancient art and magnificence; but here everything that is venerable for its antiquity, or beautiful for its material and workmanship, is subject to malicious injury. The spoliage has been committed in some of the most extensive ecclesiastical buildings in various parts of the county is unlimited. It is impossible to view, without indignation, so many of its once noble and highly adorned churches savagely despoiled of every graceful and ornamental feature under the plea, perhaps, of necessity or convenience. But what excuse can be proffered or accepted for mischief perpetrated for its own sake, permitted by negligence, encouraged by parsimony, or, for the reverse is sometimes alleged in extenuation of the offence, effected by prodigality?" It should not be forgotten that this indictment against the Devonshire clergy, for of course they were the real offenders, is dated as late as 1834, and hence it may be assumed that all that had been done up to that time was not sufficient to satisfy their aversion to the beautiful work of an earlier age.

In some of the examples cited it might be supposed that the terror inspired by remains of antiquity had overcome men's reason. The beautiful sepulchral chapel of Sir JOHN SPEKE in Exeter Cathedral was converted into a public thoroughfare. At Barnstaple there were three aisles, which became displeasing to the eyes of the men who were supposed to be the guardians of the building, whereupon "the arches and pillars which sustained the triple roof have been entirely demolished, and with these every vestige of antiquity which the interior contained, save only the huge tower in the centre of the south aisle, which was left for want of means to destroy its massy walls." At Bideford the clergy granted one concession, for, instead of destroying the clustered pillars, they "have removed them into the churchyard, where they serve as gateposts before the porch of the temple to which in better days they belonged." There was a rooted aversion to tracery, and of course it received scant mercy; consequently, says a correspondent, "the windows of very few of the churches exhibit anything more than a row of yawning apertures." In another place he regretfully remarks how "the same hands which at one

* *The Gentleman's Magazine Library*. Edited by G. L. Gomme, F.S.A.: English Topography. Part III. (Derbyshire—Dorsetshire.) London: Elliot Stock.

time are employed in squandering money and torturing materials into the ugliest of forms, are at another perhaps not very distant period engaged in the destruction of an ancient church or a curious domestic building, thus exterminating the models of ancient architecture, which ought to be spared and protected as furnishing the standard of the Pointed style."

It is needless to say that so important a county as Devonshire furnished subjects for many notes which still have interest for the archæologist. One relates to the chapel which used to stand on a bridge of Exeter. Owing, we suppose, to a settlement, a crack appeared in one of the walls, and "the protecting genius of the church would exclaim, 'Repair, but not destroy!' but this small, still voice would be drowned in the yells of the demon of improvement." As a rule Exeter is not credited with the possession of a desire to improve, but sixty years ago the city may have wished for changes. At any rate St. Edmund's on the Bridge was demolished about the year 1835. It was a red sandstone building, parts of which, at least, dated from the thirteenth century. These consisted of a nave and side aisle; there were also galleries which appear to have been erected in the reign of JAMES I. The font was modern; it "resembled an apothecary's mortar, and when not used was drawn up by pulleys to the bressummer of the west gallery."

A communication from Awliscombe explains the kind of tithes which were exacted in that parish, viz. for every cow giving milk 4d., for every calf 4d., for the foal of every mare 1d.; for every hogshead of cider 4d., for every herb garden 1d., for every acre mown 4d., for every lamb 4d., for every fleece of wool 2d., for every pig 2d., a hearth 1d., honey and geese in kind. The clerk was paid 2l. 12s. a year and the sexton 1l. 3s. In the church of Clyst St. George "the corbels which terminate the hood-mouldings of the large west window of the tower, though very roughly carved, clearly represent, one, a female with a horned head-dress, and reticulated jewelled crespine enclosing the hair; and the other, a Saracen, with turban and moustache." The tower was erected between 1460 and 1481, and the writer asks, "What had we to do with the Saracens at that period?" At Ford Abbey there was an auction held in 1846, and among the lots were "five pieces of Arras tapestry, after the cartoons of RAPHAEL, presented by Queen ANNE to Mr. Secretary GWYN, and for which his son refused 30,000l. offered by Count ORLOFF on behalf of the Empress CATHARINE of Russia." They were bought by the new proprietor of Ford Abbey for 2,200l. Among the places described is Hayes Wood, the birthplace of Sir WALTER RALEIGH. It is a brick edifice, one storey in height, with a long garden in front. The room in which he was born is pleasant, commanding a view of the garden and the romantic scenery around. RALEIGH wished to purchase it, for, as he said, "From the natural disposition I have to the place, being born in that house, I had rather seat myself there than anywhere else," but the proprietor declined to sell.

There is a long history of Tavistock Abbey which, since the Reformation, is associated with the BEDFORD family. It was surrendered in 1538; the abbot obtained the very large pension of 100l. a year, the prior obtained one of 10l., the monks from 6l. to 5l. 6s. 8d., and novices 2l. a year. The abbey church stood until about 1670. It was a noble building about 350 feet in length; the chapter-house and Saxon school were demolished in 1736, in order that the site might be used to build a residence for the Duke of BEDFORD's steward. A Saxon school existed in other places besides Tavistock, for according to Archbishop PARKER, as many of the early charters and monuments were written in the Saxon tongue, such schools were provided in order to continue the language from age to age, lest it should become obsolete. The abbey was one of the earliest to possess a printing-press, and a translation of the "Consolations" of BOETHIUS was issued from it in 1524.

There are extracts given from the churchwardens' accounts for the church of St. Eustace, Tavistock. Among these are charges for collecting rushes for strewing the church before festivals, for sending a man and horse to Plymouth to buy wax to make candles, for repairing windows and painting figures on them, for drinkings to the workmen, and so on. At a later time we read of 8s. being

paid for killing eight foxes, and 9d. for a chain to fasten the "dictionarie" in the schoolhouse.

The communications from Dorsetshire do not display the interest in the preservation of churches which marks those from other counties. We must imagine either that few misdeeds were to be recorded or that the correspondents were indifferent, and the latter supposition is the more probable. There are two churches which have secured attention, viz. Sherborne and Wimborne. Sherborne Collegiate Church or Minster was at one time a cathedral. It was nearly all destroyed by fire in 1436, when the building was the scene of a row which arose out of a desire on the part of the inhabitants to assert their privileges. The body of the abbey was used as a parish church, but the townsmen afterwards set up a claim on a chapel known as All Hallows, which was to be employed as a baptistery, and they placed a font there. The monks objected. In one of the altercations "a shaft with fier" was shot into a partition that divided the monks from the laymen, and a fire took place which caused great destruction. The columns and arches supporting the tower and the gallery round the lantern are parts of the Norman work that have survived.

There is a tradition that ALFRED designed a church at Wimborne, where his brother ÆTHELRED was buried. The condition into which the building that has so legendary a history had fallen in 1800 may be judged from the following extract: "Within the church the eye is gratified with decent whitewash and regular pews; though the information about the churchwardens who presided at that improvement had been more fitly preserved in the parish register than written over the centre arch of the church; such pitiful ostentation violates the general aspect of antiquity. The organ appears modern, and in size well adapted to the church. Its west front has much finery, and that towards the choir was never surpassed in tawdry-decoration by a gingerbread watch. It has a disgusting effect."

We have said enough, we trust, to suggest the courage which was so often exhibited in gloomy days by the correspondents of the *Gentleman's Magazine*. The critics would no doubt be often puzzled to explain the grounds on which they condemned the operations they saw in progress. But they knew that what was being perpetrated would diminish the value of the old buildings, and on that account they attacked all who had a share in it. There is much else in Mr. GOMME's selections which will be interesting to our readers, and the volumes will form a valuable work of reference for everyone who has an interest in English buildings.

CONDITIONS OF FORESTRY AS A BUSINESS.*

FORESTRY is a business, like agriculture—an industry which is concerned in the production of a soil crop. It is the art of managing a wood crop so that it will make the best harvest of timber in the shortest time at the greatest profit. Forestry differs from agriculture, however, in that it takes many years for the crop to mature, and the crop is then a complicated one. Forestry in the United States as a defined business is now in its earliest stages—chaotic and undeveloped. In its most perfect conditions forestry is not a single science or art, but combines relations to several sciences and arts. On its scientific side it touches botany, chemistry, geology, meteorology, physics, geography and entomology; on the art side it touches horticulture, arboriculture, lumbering and protection from fires.

In parts of Europe the growth of timber is already well systematised, but knowledge of the subject in all its details has been of slow growth. More than a hundred years ago a few alarmists in Europe prophesied an approaching dearth of timber. This agitation helped to induce economy in the use of timber, and to delay the evils predicted. Without giving the strictest attention to systematic arrangement, we may note some of the chief attainments by the leading countries of Europe in the management of forests, and the methods adopted to accomplish such results.

It would seem that Government ownership and control of much of the forests in the old country gave a great advantage over our newer country, where "private enterprise" accomplishes almost everything. There even the woodlands of corporations and of individuals are subject to the laws of the

* A paper contributed to the *Engineering Magazine*, New York, by Mr. J. Beal, M.S., Ph.D.

country, which specify how much may be cut in each year. These laws are enforced by officials well educated for the business. Forests are systematically inspected, and reports made concerning their condition and needs. The inspector acts as "a paternal adviser" to all owners of forests. In the words of a recent American consul to Austria-Hungary:—"The owner of forest land in Austria must exercise extraordinary care not to be guilty of trespass upon his own lands." How different the feeling of owners of land in the United States. In the country above referred to the array of forest officials of various grades maintained numbers nearly 32,000 persons. In all of these particulars the fact must not be lost sight of that wages are much lower and interest on investments much less remunerative than in the United States.

The large number of officials who must pass rigid examination makes it possible and even necessary to maintain numerous schools to keep up a supply of skilled men. The encouragement of profitable employment induces pupils to patronise the schools, which give laboratory or practical work, often in the forests, as well as lectures in the classroom. To some extent these subjects are taught in other schools than those for the special object of educating foresters. These officials usually serve for life, and are pensioned in old age or in case of disability.

By dint of great energy of a few persons in this country attention has been called to the greed and dishonesty of men who steal timber from the public lands and to the evil effects of removing vegetation from mountain slopes. Many instances of the same kind have been enumerated in Europe, where the evil effects remain as a warning to newer countries. The cost of reclaiming some of these waste places has been great. In this reclamation seeds from the scattering trees cannot be relied on to furnish seedlings for the new growth, but nursery-grown stock must be well set and afterwards properly cared for. Experience has led to the formation of many rules in relation to forest management. For example, on sandy soil and on steep mountain slopes timber can only be cut in narrow strips or thinned out. Grazing among timber is never permitted. Stringent rules in regard to igniting fires in or near forests are enforced.

Between 1860 and 1887 France reforested over 250,000 acres of mountain lands at a cost of 30,000,000 dols., the State paying one-half. In 1887 the total annual appropriation for the forestry department of France was 5,000,000 dols. Here the people of the United States may well take warning. How much more economical it would be to spend a little money now in preventing devastation than to suffer the consequences for a time and then possibly spend enormous sums in restoring the forests to the mountain slopes.

In Germany about 25 per cent. of the entire area is devoted to forests. Of this amount about 32 per cent. is Government land, 15 per cent. belongs to communities, 1.3 per cent. belongs to charitable and other institutions, 2 per cent. belongs to corporations and 48 per cent. belongs to private parties. Without the supervision of state officials "a reckless devastation of forests would be the consequence," just the condition we are experiencing in most regions of our own free country. In the Eiffel district the mountain slopes were reforested and otherwise improved at the expense of the Government, though much of the land belonged to communities.

A chief director of forests in Germany, in writing to a United States consul, says:—"You are certainly quite right when you speak of the importance of forest culture for the United States, but allow me to express my belief that no earnest work in that direction will be accomplished there. The culture of the forests proceeds too slowly to suit your countrymen, and the profits are not forthcoming soon enough. In my opinion good results from forest culture can only be had in the United States when the Government shall have taken the matter into its own hands." Dr. Otto von Hagen says:—"The forest is a trust handed down to us from past ages, whose value consists not alone in the income derived from wood, but also in the importance which it exerts through its influence on climate and rainfall or land culture. Its importance is not merely a question of the present day or of the present ownership, but is also a matter which concerns the future welfare of the people." For these and other reasons it has been determined that it is a duty to interfere by legislation with the waste of timber.

Think of the time required to grow trees of certain species fit to cut for important purposes. In Germany the age for cutting oaks is 150 to 180 years; beech, 100 to 120 years; Scotch fir or birch, 30 to 100 years; though for some purposes, of course, trees are cut when much younger. One of our consuls to France in 1887 observed that "forests are much more easily destroyed than replaced, for in three years, from 1788 to 1791, almost as large an area in France was deforested as has been reforested in the last ninety years, although much attention has been paid to the subject during this time."

The older and more thickly-settled countries of Europe have all passed through the stage in which many of our states have but recently passed or are now passing. Their land in most instances was well covered with forests. They cut and fired

and wasted as we are doing, and have long been aware of many of the evil effects of this practice. To what extent shall we learn and profit by their mistakes?

Under the circumstances what can the people of the United States accomplish? In what ways can we best secure a reform in forest management? Legislation, whether state or federal, will accomplish little, until there are enough stalwart persons thoroughly interested to continue under adverse conditions to work for the success of a better management of lands in forests or lands which ought to be covered with forests. Something may be done by forest commissions, but too much is likely to be expected of them, and to save expense somebody will advocate their abolition—and somebody sooner or later will succeed. The value of forestry commissions consists chiefly in giving advice and in educating the people.

Tree-planting on a large and expensive scale is not likely soon to be so skilfully conducted that satisfactory profits will be apparent. But notwithstanding, trees of every kind should be planted in many places, and the sooner the better for us all. Probably not one in a thousand now knows enough about the subject to proceed intelligently to take the best care of his forest or to reclothe land with timber in the most economical manner. Those who try the experiment should be able to wait.

Over a hundred years ago some persons in Europe were foolish (?) enough to plant a few white pines from North America. In the language of our time they would be known as "cranks," and yet who shall dare place a sufficiently high estimate on the value of that simple experiment, for it has demonstrated that our white pine is one of the best of trees to grow for timber in that country? We need men in every county of every state who will have enthusiasm and foresight enough to plant a few trees in places where there may be a prospect for growth a long time without molestation. Before these experiments are completed there will be many anxiously waiting to profit by the results.

We live in a comparatively new country, where our fathers and grandfathers cut down and burned the finest of trees to make room for crops and pasture. We have been taught to destroy trees and not to save them—much less to replant. The arguments for preserving the virgin forests of a new country are by no means all on one side, and no one should expect the trees to be preserved. In most cases the profits of holding are too small to pay for the investment.

Michigan once had about 150,000,000,000 feet (board measure) of standing pine, which was believed to be well-nigh inexhaustible. Those now living find remaining only comparatively small tracks in the back counties. Even with what might be considered good management in a thinly inhabited country, where lumber was cheap, it was soon found next to impossible to preserve this timber, however much the owners might desire to do so. In many seasons the fires destroyed as much pine as the woodman's axe. Dead pines must be cut to save them, and the *débris* was almost sure to burn and the fire to spread to the standing trees. To some extent the same condition of things prevails with regard to the "hardwood" trees, though in most cases these are not so likely to be destroyed by fire. In a business way there are men now spending much time and money in defending their remaining pine lands from fire. But more system is needed, and the care should be more general than it ever has been.

The study of European methods and results in forestry by competent men is not enough, says one writer.* It is not even the most important thing for us. Nothing can be very useful to us which is not based upon careful study of the conditions peculiar to this country. We must have in time a system of American forestry if we are to avoid serious disasters to our national interests and civilisation. The forestry of this country must be the product of growth, which has as yet scarcely begun. It will be developed by continued and widespread observation, and by constant comparison of the results of practice. It is necessary to remind ourselves that no useful system of forest management can be originated or created by legislative enactment. There must be special knowledge and national good sense regarding the needs of this country behind forestry laws, or they will be useless and mischievous.

It is important to understand the value of great areas of growing trees on the surrounding cultivated land, and to know in what respect they check fierce winds, prevent rapid evaporation of moisture, or encourage late frosts in spring. But the possession of this knowledge is not likely to induce men to save trees or to plant trees for the benefit of persons owning farms in the surrounding townships or in other counties. Here is one of the best of reasons why the state and nation should take an active part in the management of forests.

It is difficult to induce most persons to understand fully the results of a timber famine. They have heard more or less of this talk for years, but they believe the day is yet far distant when our people will suffer much inconvenience from lack of timber. They argue that, as timber becomes scarce and more

* "Garden and Forest," vol. i, p. 26.

expensive, less of it will be used. We shall burn coal for fuel, and use more iron and steel. Transportation will be cheaper, and timber can be transported for long distances. The use of the land to produce various grains, grasses, fruits and vegetables will help to pay higher prices for timber.

In the moister portions of our country, when the original forests were cleared away, seedlings and sprouts in immense quantities sprang up to contend for every foot of available space. In cutting away the valuable timber there are usually large numbers of "young things" up to 6 inches or more in diameter which, if protected from fire and other destroyers, have already made a fair start toward renewing the forests. Too little care is usually observed in protecting this young growth, which is admitted to be of no value at the present time. Because there are no dollars in them now the proprietor is likely to let them go to waste. In very few instances in moist climates would it be necessary to plant trees started in the nursery.

The writer has often been asked by bright young men of no resources except their active brains and hands, "What is there in this country to encourage a young man, who must earn his living as he goes along, to make a specialty of forestry? I like the subject, and if I saw a good living in the business I should run the risk and go ahead." I am free to say that so far work in this field seems to be done gratuitously.

A few persons in our agricultural colleges have done a little in this direction, mainly to call the attention of students to the magnitude and importance of a study of forestry. Before any one of us thought much about trees the courses of study in these colleges were replete to suffocation with subjects of seeming importance. Elective courses are expensive. The writer has twice given a course of lectures daily for twelve weeks to members of the senior class of the University of Michigan, or to those who elected forestry. A course of parasitic fungi runs parallel with that on forestry, and only one of the two can be elected. No doubt there have been similar reasons in the other schools to prevent giving more attention to forestry. But if we are interested and make the effort we can all find some opportunities for this work.

Lectures at farmers' institutes now held in many states afford some opportunity. But here the indifference of the hearers tempts us to select other subjects. Vividly does the writer call to mind one occasion at an institute in a new county in which he spoke of the importance of preventing forest fires. The first one to lead in the discussion was a farmer living in the neighbourhood, who won the applause of the audience when he said of these fires, "They are the best friends we have in clearing up the country."

The more students know about trees, the more they are likely to be interested in this subject. The things to be learned are the different species, their names, their anatomy and physiology, their rate of growth and geographical distribution, their special uses in the arts and in nature, how to raise trees from the seeds, how to plant and where to plant and why, and especially how to take proper care of them after setting. He who fully understands the structure and functions of roots will never be seen carting living trees with roots exposed to dry wind and sun for miles along the highway. Students may be set to investigating the effects of pasturing a wood-lot by noting examples of those pastured and those left to themselves. They may estimate the amount and value of an acre of good, medium or thin forest, and note the time required to produce it. The effect may be noted of trees as a shelter along the highway or near dwellings, barns and sheds. Other questions are, why are certain trees found growing in swamps and others on dry land? Why are there no pines or cedars in some neighbourhoods, and no beeches or maples in others?

Besides the means suggested for aiding the cause there are others. If the programmes were judiciously prepared and well carried out the celebration of Arbour Day by school children would have a tendency to awaken an enthusiasm among the people, but usually the exercises consist mainly of quotations from literary authors—scraps of poetry, history and sentiment—rather than any substantial information pertaining to the needs of forestry. The establishment of an arboretum, even a small one on some of the farms of enterprising people, and more especially at each agricultural college and experiment station, would help to educate and interest the people. We cannot soon expect to see an Arnold arboretum in every state, but the beneficial influence of that garden has already reached thousands of miles.

Associations for securing the protection of certain private natural scenery help to educate everyone who sees the reserves. Botanic gardens containing shrubs and trees are likely to increase in numbers, each good one lending encouragement to others. So of herbaria, and especially of museums of plant products, which should contain no end to interesting specimens of timber—not only those which were well grown, but likewise all manner of monstrosities. The writer a few years ago collected and placed in position a unique collection of this kind, and, considering the cost, it was more attractive than an

ordinary museum of fossils, minerals, or stuffed animals. Who can tell the good results likely to occur to forestry from the establishment and maintenance of the Jesup collection in Central Park, New York?

Several books have appeared that are worthy of notice, but none of them can be compared with "The Silva of North America," by Professor C. S. Sargent, the first four volumes of which have been published. In several states reports have been issued by forestry commissions or forestry associations, or special bulletins on the subject have been published by experiment-stations. The United States Government has, through Mr. Fernow, the efficient head of the Forestry Division of the Department of Agriculture, for some years past been active in advocating measures of importance in relation to forestry. Bulletins and reports and gratuitous lectures and frequent conferences with congressmen have all had their effect in awakening an interest in this subject. There are several journals, notably *Garden and Forest*, which have exerted a good influence in behalf of tree-protection, and such articles as the *Engineering Magazine* has published lately on the great waste of lumber still in progress are of value in properly educating the public mind.

From the condition of things here outlined it will be seen that the growth of an interest in forestry must be slow for some time yet, but I anticipate very great changes in the sentiment of our people and the formation of salutary laws by the close of this century.

ST. THEODORE, VENICE.

THE Venice correspondent of the *Scotsman* writes:—In 1127 three giant granite monoliths, each about 50 feet in height, were brought to Venice from the East. They were bought and paid for, and not stolen, as everybody says. One lies buried in the lagoon in front of the Doge's Palace, and the other two were set up in 1173, and these are they that now so majestically grace the entrance to the city from the Piazzetta of San Marco. In or about 1200 the two patron saints of Venice were set upon their summits—St. Theodore standing on a crocodile on the one, and St. Mark under the symbol of a noble lion on the other.

For nearly seven centuries they have stood on their noble pedestals keeping watch and ward over the Queen of the Adriatic at their feet. But in these recent days both saints and pedestals showed signs of decay, and it was feared if nothing were done Venice might wake up one day to find that her long-neglected saints had become her destroyers. Accordingly, the Great Lion of St. Mark and its pedestal were first examined and repaired. Then St. Theodore and his crocodile and his pedestal were subjected to the same scrutiny and kind treatment, and I purpose telling in few words the story of that, with the strange discoveries it has led to. First, St. Theodore and his crocodile were brought down to the ground. He was found to stand 10 feet in height, and his animal measured 14 feet in length. Both were made of Greek marble, bound together with iron coated with bronze. As only in Athens iron was so coated, a Greek origin was suggested. On closer examination it was found that half the marble was good and half was bad. Then it was discovered that half the workmanship was good and half bad. The head and upper part were of good material and well carved; the lower half of the body, like that of Nebuchadnezzar's image, is base in material, and besides it is base in execution. Then it was discovered it was not St. Theodore at all, nor one homogeneous person even. The figure has the head and bust of a Roman emperor, with the lower part of the body and limbs of some inferior person. But the legs of the figure and the part of the body of the crocodile on which it stands are one piece of marble, and a closer examination of the animal showed that its form was as much that of a dragon as a crocodile.

A good deal of discussion has been carried on concerning these matters. The opinion that is gaining ground is that of Sig. Vendrasco, who is the clever engineer in charge of these monuments, that the upper part of the figure is that of the Emperor Constantine, with his crown of laurel and breastplate with the Christian cross on it and decorated with eagles and lions, and that the lower part is that of an inferior Greek statue. A curious fact is that the shield is on the right arm, whilst the left hand holds the spear. The spear is wood coated with bronze. What is certain is that it was set up to represent St. Theodore and his crocodile, which is the main thing. Now for what has been done. The statue was originally in seven parts; it was broken into 100. The abacus of the column was shattered. The capital was not a solid block of marble, but a hollow cylinder filled with bricks and rubbish, and the rain entering and the frost affecting it, it was split vertically and horizontally. The huge monolith, weighing with capital, base and statue over 100 tons, leaned, like Pisa's Tower, a long way off the perpendicular. Signor Vendrasco has straightened the column, which, unlike its sister companion, goes into a socket over a foot in depth. He has

bound up with copper girders the capital, repaired and relaid the abacus, and he has made a new man of St. Theodore and set him up once more on his crocodile's back on his lofty pedestal. He has made a lighter man of him, for he has taken out of him over 2,000 lbs. of lead and 300 of iron and 150 of copper. The work was only completed the other day, but it is hoped no time will be lost in removing the unsightly scaffolding so that Venetians may once more be able to see their saints, and visitors, who are now pouring into Venice, may be able to see in all their symmetry and beauty these ancient historic monuments. As in the case of the Great Lion here, casts of St. Theodore and his crocodile have been taken, which will be sent to Rome, Paris, London and New York in all probability.

EDINBURGH ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon a large party of the Edinburgh Architectural Association, under the leadership of Mr. Hippolyte Blanc, A.R.S.A., visited Prestonkirk, Whitekirk and Tynninghame, with the remains of the priory there. At Prestonkirk the party were met by the Rev. Mr. Marjoribanks, who kindly placed the church open. Mr. Blanc explained that the existing building was believed to be on the site, and indeed partly on the foundations of the original church, and was perhaps the oldest ecclesiastical foundation in the Lothians, a religious house having been established there by St. Baldred towards the end of the sixth century. The most interesting part of the visible remains was the chancel, of the thirteenth century, the exterior of which remained nearly entire, a beautifully proportioned piece of work. Proceeding to Whitekirk, the party were received by the Rev. Hately Waddell. Mr. Blanc, by the aid of a number of specially prepared drawings, explained the features of the church in plan and detail, all the parts of which indicated the fifteenth century as the period of erection. The original church on the same site he noted as having been erected in the twelfth century as an offshoot from Tynninghame. The structure was afterwards examined by the party, who, by the kindness of Mr. Waddell, were shown several interesting belongings of the church. Driving by the Binning Wood to Tynninghame House, the party were received by Lord Haddington, who personally conducted them, and exhibited the rich treasures in paintings, relics and curios, of which the house is abundantly possessed. The interesting remains of Tynninghame Priory, so well preserved in the grounds, were also visited, and were explained by Mr. Blanc to represent the chancel and apse arches of a once very important edifice, erected along with Lindisfarne Priory, to which it was attached in 1093. By a plan of the remains, and also a plan of Lindisfarne Priory, it was shown that the dimensions, so far as they could be compared, were nearly the same in both. The rich detail of the ruin was examined with considerable interest. The several gentlemen who had contributed to make the places visited instructive were duly thanked, and before leaving Mr. W. W. Robertson expressed for the members their appreciation of the courtesy and kindness shown them by Lord Haddington.

TESSERÆ.

The Palace of Spálato.

AS the first consistent arched interior, the hall of Diocletian's palace contains in it the germs of all later architecture; the germs not only of Ravenna and Pisa, but of Caen and Durham; not only of Caen and Durham but of Westminster and Amiens. As such there is no more memorable building upon earth. But it is in no way wonderful that the great improvement which it offered was not at once universally accepted. Every architectural development has to go through a stage of transition, a stage when the new principle and the old are striving for the mastery, and when the two are mingled together in various degrees and proportions. The architect of Spálato showed that columns could be used as the immediate supports of arches; he did not at once persuade the whole world to use columns as the immediate supports of arches. Men had been so long used to look upon the entablature as the right thing to rest upon the capitals of the columns that they could not all at once bring themselves to let the arch come straight down upon the capital itself. It seemed as if something must be done, as if some change must be made, to adapt the capital to its new duties. Something must be thrust in between the capital and the arch; some fragment, as it were, of the entablature, must come between the abacus of the capital and the impost of the arch. Or perhaps the abacus itself must be enlarged into something like a piece of entablature, or the whole capital must be drawn out to an unusual size and height, in order to seem more worthy of its new prominence, and better able to bear the weight that was laid upon it. For it is manifest and it is one of the great advantages of the arched construction, that the

columns or other supports of a range of arches, may be placed at much greater distances from each other than the columns of a colonnade supporting an entablature. It follows that each column and its capital assumes in the arched building a greater importance; it has, so to speak, a more distinct separate existence than belongs to the columns of a colonnade. In the later Roman architecture we therefore find all kinds of shifts to avoid that immediate juxtaposition of the arch with capitals of the hitherto accustomed forms on which the architect of Spálato had already ventured.

Architecture and Social Life.

The history of architecture, like that of the other arts, marks out the progression of manners. Among the Dorians it carried with it the austerity of their national character, which displayed itself in their language and music. The Ionians added to its original simplicity an elegance which has excited the universal admiration of posterity. The Corinthians, a rich and luxurious people, not contented with former improvements, extended the art to the very verge of vicious refinement. And thus (so connected in their origin are the arts, so similar in their progress and revolutions) the same genius produced those three characters of style in architecture which Dionysius of Halicarnassus, one of the most judicious critics of Greece, remarked in its language. The Dorians exhibited an order of building like the style of their Pindar—like Eschylus, like Thucydides. The Corinthians gave their architecture that appearance of delicacy and effeminate refinement which characterises the language of Isocrates. But the Ionians struck out that happy line of beauty which, partaking of the simplicity of the one without its harshness, and of the elegance of the other without its luxuriance, exhibited that perfection of style which is adjudged to Homer and his best imitators.

Paints in Venice.

It is well known that the Venetians were abundantly supplied with the finest colours of every description; their great trade with the East rendered the acquisition of them easy. When Philip II. ordered Michel Cocxie to copy the famous altar-piece of the *Adoration of the Lamb*, by the Van Eycks, Cocxie complained that he should not be able to procure a blue of sufficient excellence for the drapery of the Virgin, whereupon Philip wrote to Titian for some ultramarine, which he procured, and it was of so costly a kind that Cocxie used for the drapery of the Virgin about a quantity of the value of thirty-two ducats.

Lawrence as a Portraitist.

If ever there was an artist who reduced everything that he attempted to the level of his own capacities, it was Sir Thomas Lawrence. Unquestionably a man of genius, he was more than a mere copyist; he painted men and women, and not mere faces. But as his own intellect, feelings and tastes rose only to a certain limit, and were imbued with a certain peculiar and unimaginative spirit, so he comprehended only a certain fragmentary portion of the minds of his sitters, and transfused into them all alike a measure of that semi-refined, semi-intellectual, semi-graceful and artificially-polished sentiment which was so strikingly exemplified in his own feelings and intelligence. Sir Thomas Lawrence embodied the spirit of the cultivated English drawing-room and conversazione. In scarcely any of his pictures did he conceive of any character in which the artificialities of civilised life did not exercise a most powerful sway. His gentlemen and ladies are always dressed for the evening, never vulgar, never *outré*, never stupid, never commonplace, never exaggerated, but never great. The gentleman and the lady is more prominent than the man or the woman. He did not paint for mankind; he did not even paint for his own generation; he painted for the class of society who took him up and patronised him and bought his pictures and thought him the first of geniuses and the most gentlemanly of artists. The hand—that portion of the human frame in which high birth is supposed pre-eminently to display itself—was elaborated by him with as much care as the most speaking feature in the countenance, and in truth, in our judgment, it was sometimes the best part of his pictures. In a word, he painted up to his own conceptions of that which is valuable, estimable and enviable, and there he rested. Turn, then, from the inanities of these days to the portraits of a Raphael, a Rubens, a Vandyke, a Velasquez, a Titian, or even to those of a second-rate class, as of our own Reynolds or Gainsborough. Who does not feel in a moment that, in contemplating their noble works, he is communing not only with the men of other days whose countenances he beholds, but with the thoughts and conceptions of the painters themselves? Those glorious portraits are poems every one of them. They are like the episodes in an epic, which give us little touches of human feeling and human character, and at times can move our hearts and call forth our veneration more powerfully than the most triumphant achievements of professed historical art. Like the characters of Shakespeare, they are for all ages and all nations. What is it to us that they

are clad in the garb of Romans or Venetians or Spaniards or Englishmen? It is their true, living, breathing humanity that gives them their imperishable charm. They are not merely the outsidings of men; they are the forms in which the minds of other days were clothed; and when we stand and watch their speaking lineaments it is not alone the wondrous skill of the painter that rivets our attention and stimulates our feelings; it is the consciousness that we are carried back centuries in the history of our race, and almost privileged to converse with the very men who figured among the most celebrated of the earth, and were cast in the same mould in which we ourselves are still formed. And when we recur to the recollection of the artists who spread the glowing tints upon the canvas it is not so much an admiration for their skill in all the learning of their craft of which we are conscious as a respect for their lofty intellects, their cultivated taste, their poetic genius, and their knowledge of human nature.

Cluniac Churches in England.

Pomp and splendour were the characteristics of the superb churches of the Cluniacs. They were radiant with colour, blazing with crystal, jewels and crowns of light. The parent minster at Cluny, with its vast apse girdled with marble pillars of huge size, its double transept and splendid lanterns, produced no building so solemn and imposing in this country. Here they betray caprice, irregularity and utter contempt of orderly arrangement. The cloisters of Wenlock and Lewes seem to have had their surrounding buildings thrown at haphazard upon the ground. We find instances both of oblong and apsidal chapter-houses. Perhaps a shallow transept, imported from continental examples, is one of the principal characteristics of the Cluniac churches. The ante-church may be traced at Lewes, which has also the rare feature of a coronal of chapels clustered round the aisles of its central apse. In Castle Acre and Wenlock we trace the fulfilment of careful and good design. The Cluniac order had only thirty-two English houses.

The English Standard.

The pictured representation of the great fight of Senlac (which we call the battle of Hastings), which has been transmitted to us by the needle of Matilda, the Conqueror's queen, does not give us anything like distinctive colours in the Norman army. Before the Saxon Harold is borne the national standard of the dragon, but William and his followers simply attach to their lances small swallow-tailed flags of white, with coloured crosses and borders, bearing a great similarity one to another. In the battle of the Standard, about a century later, though the English had a general ensign of such size and importance as to be drawn upon a four-wheeled carriage to the battle-field, it consisted of two ecclesiastical banners, those of St. John of Beverley and St. Wilfrid of Ripon; the figures, that is to say, of those holy men, embroidered upon the hangings in use at that date in churches and processions, which were brought into action more from a belief in their miraculous powers than as a national distinctive emblem. It is somewhat remarkable that the famous French standard, the oriflamme, or flame banner, anciently belonged to the abbey of St. Denis, near Paris, and was borne by the kings of France, in honour of St. Denis, in right of their possession of the territory of the Vexin, whose counts were patrons of that church. The devotional turn given by the Crusades to the warlike spirit of the age brought the cross into use as a national English distinction, though its colours at first were the exact reverse of those afterwards appropriated to the banner of St. George (red upon white), which still "flings its crimson blaze" wherever the meteor flag of Britain, the Union Jack, floats over ocean. But the effect of the Crusades was to introduce a fresh fashion, from whence the modern science of armorial bearings took its rise. The scorching heat of the climate of Palestine made it absolutely necessary to protect the warrior from the rays of a blazing sun by some covering less susceptible of receiving and retaining heat than armour of metal, and from plain loose frocks of one colour, the surcoats, as they were called, gradually became embroidered records of the prowess or rank of the wearer. Hence the term coat-of-arms, and the introduction of rules to define in what way they should be ornamented, and to prevent the confusion which would soon have arisen if any other person than the immediate relations of the warrior or noble originally adopting a device had been allowed to copy and appropriate it. When we remember where and under what circumstances heraldry took its rise, we shall not be surprised that the lion became the favourite symbol of the warlike nobility who were battling against the Saracen power in Palestine. The magnificent quadruped, whom we call the king of beasts, would be an object of tenfold admiration to those who saw him for the first time, or heard his strength and noble bearing described in the poetical phraseology of the East. The lion was adopted by several crowned heads as their personal cognisance; and, the fashion spreading, our Anglo-Norman nobles soon learned to regard him as the only animal worth bearing on their shields. Richard himself could do no less,

in justice to his name of "Lion-heart," than adorn his shield with the representation of a pair of lions leaping up to fight each other, the first regular arms assumed by an English monarch, shortly exchanged by him for the familiar three lions of our present royal arms. Some time, however, elapsed before the personal ornaments of the sovereign were converted into a national flag; and it is not until the reign of Edward I. that we find the king's banner, joined with those of St. George and St. Edward, triumphantly floating from the battlements of the Scottish fortress of Carlaverock, which had surrendered to his troops. In fact, at that time the royal banner would not have been displayed except where the king fought in person, and sometimes not even then, if, by way of compliment to some eminent leader, he desired, as our fighting Plantagenets occasionally did, to serve as a volunteer under him. Still slowly, as heraldry became more familiar to the people, more bound up with the associations of everyday life, and as the constitutional progress of national government gave more influence to the monarchy, the lion became more and more naturalised as the symbol of representation of the national sovereignty.

The Outer Parts of Roman Houses.

The Romans, while fond of public life, were jealous of the privacy of their domestic arrangements. As regarded the public portion of their houses, access was readily attainable, but they were not accustomed to entertain guests, and when they did so lodged them usually in separate buildings rather than under their own roofs, although they occasionally accommodated them in rooms round the atrium or outer hall. The division of a more or less public character contained the entrance, the hall and some of the surrounding chambers and corridors. In the case of palaces or houses of importance there was usually an open space in front. This was called the area. It was sometimes planted, but more often laid out architecturally and ornamented by statues or fountains. The traces of this arrangement survive in the numerous piazzas or open squares of modern Rome. Opening from the area was the principle entrance, approached by a portico or colonnade, which was sometimes arched. This adjunct, so useful in southern climes, served also to give dignity to the mansion to which it was the entrance. It was only applicable as it would be among ourselves to the more important buildings. At Pompeii it is not found, as the space in that small town is too much occupied to allow of it. In such cases the houses had no piazza or area, but there was sometimes a small porch or portico opening on the public street—as in the building which goes by the name of the House of Diomedes. The latter feature was at first reserved as a privilege of the great, but after the time of Nero it became common and was in ordinary use in the improved houses built at Rome after the great fires of that emperor's reign. The porticos served to break the monotony of the streets and afforded an agreeable shade, not only to the entrance of the houses, but also to the shops which usually flanked them. At Pompeii the streets are too narrow for porticos, and their monotony and poverty of architectural effect are mainly due to this circumstance. Between the portico and the atrium we find the vestibule, serving as an outdoor waiting-room or approach to the house. The arrangement is not without architectural importance. However striking a building may be, the eye requires to be gradually introduced to it, and the effect of an interior is greatly enhanced by a proper mode of approach. In the palaces of the Romans vestibules were usually found, and Vitruvius says that in the mansions of great people they should be spacious and dignified. In smaller houses the vestibule was, of course, on a reduced scale and was sometimes altogether omitted. In Pompeii it is found occasionally, but not in any case of large size. The arrangement of a vestibule is still found existing in the great churches of Rome, such as St. John's Lateran and St. Peter's. It is, of course, only suitable on an extensive scale to important edifices of considerable dimensions and of some architectural magnificence. Entering the portico and then the inner doorway through the vestibule, the great hall or atrium is seen beyond, but between the door and the atrium is a corridor or outer hall. This latter was called the prothyra. It was not only the entrance to the house, but also served as a means of access to the apartments on either side, which in small houses were sometimes shops where the proprietor sold the produce of his farm or other property. In large houses they served as inner vestibules or rooms for porters or slaves. The possession of a doorway in the street being reserved as a special mark of honour, the meaner dwellings had to be content with doors from the prothyra. There were in some cases more than one door, so that the master of the house should not be obliged to pass through the crowd of servants or dependents who thronged the vestibules and outer corridors of the mansion. In the prothyra was the place for the porter or the guardian of the door and sometimes a dog was kept there. It was this custom which led to the representation of dogs in mosaic or in painting on the floor or walls, as we find in some cases at Pompeii.

NOTES AND COMMENTS.

THE Madeleine in Paris is a building in which the least attempt at decoration is difficult. From its Classic character and the unity which is throughout, the church appears complete, and additions run the risk of being regarded as excrescences. The *Curé* has been, however, of opinion that the semi-dome of the sanctuary, on which M. ZIEGLER has depicted a multitude of figures to form a sort of history of Christianity, is in too harsh a contrast with the white marble of the screen behind the altar. He was able to persuade the Government that it would be advantageous to interpose a band of mosaic, and about five years ago a commission was given to M. LAMEIRE, who is one of the great masters of decoration in France. Several of his works have been illustrated in *The Architect*. The execution was confined to M. GUILBERT MARTIN, who has sacrificed much to establish mosaic as a French industry. The subject selected is the triumph of the Church in France. CHRIST is the central figure, and He is accompanied by the saints whose names are associated with many French churches—MAXIMIN, ISIDORE, MARTIAL, FRONT, FLOUR, TROPHIME, EUTROPIUS, URSIN, JULIEN, DENIS. There are also figures of Saints MAGDALEN, VERONICA, MARTHA, MARIE-SALOME, MARCELLA, &c. It is not necessary for an assemblage of such figures, which are nearly double life-size, to display strong colours; the nearer to white they are the more successful they become. But as there is so much ormolu about the building it was necessary to have a gold ground. This caused much difficulty. It was feared that so large a mass would be too glaring and hard. After many experiments M. MARTIN succeeded in introducing a variety of tones among his gold tesserae, and if there is now less of mechanical uniformity there is compensation in the softness which is produced. The decoration is a very successful work, and it atones for such fiascos as the mosaic work in the Louvre.

SINCE France has possessions in Africa it is only rational that the "Art Mussulman" should be nurtured. That is a better course than ours, for we must have astonished the Easterns when we sent raw youths who had gained one or two certificates to expound to them the mysteries of form and colour in ornament. Afterwards there was a reaction, of which one of the consequences is likely to be the exhibition of Eastern rubbish in the Imperial Institute. The French are acting more carefully. They do not either overvalue or undervalue the art of Algiers or Tunis. They allow it room to grow, and they try to understand it. In July an exhibition of the art of the Mussulmans will be held in Paris. It was contemplated that the late JULIUS FERRY should preside over the arrangements, but that office has now fallen to M. SCHEFER, the administrator of the School of Eastern Languages. The manager will be M. MARVE, the conservator of the Musée at Algiers. There is little doubt that the exhibition will be a success, although it is only Africans who can appreciate visits to the galleries of Paris in July.

THERE can be no doubt that the late WILHELM LÜBKE was a worthy representative of German scholarship and industry. He could turn out books that related to art with the regularity of a machine, and apparently without any mental or bodily inconvenience from his unceasing production. Publishers believed in his system, and they spared no expense to supplement his descriptions with woodcuts. The pile of big volumes which bear LÜBKE's name on the title-page will appear less remarkable if we remember that he was a professor in a great many colleges, and that it was safe for him to print his lectures, for before the opportunity came for redelivering them he was likely to be in another classroom. WILHELM LÜBKE was born at Dortmund in 1826. His ambition was to teach, and he studied philosophy in Bonn and Berlin. But in a region where everybody can expound philosophy there are many competitors for every office connected with it, and LÜBKE prudently turned his attention to the history of art. He was fortunate in gaining the position of teacher of the history of architecture in the Berlin

Academy of Building in 1857, and henceforth his course was marked out. Four years afterwards he was invited to become Professor in the Zurich Polytechnikum, which he accepted. In 1866 he received a call from Stuttgart, where he remained for several years, and then he went to Carlsruhe, where he remained until his death. His unceasing industry at his desk affected his eyes during his latter years. LÜBKE deserved all the respect which he enjoyed. He made the knowledge of the history of art acceptable to all his countrymen, but it may well be doubted whether German artists would not be more successful if they were less hampered by the belief that every detail of their work must be in accordance with something or other that is recorded somewhere in a book.

FOUR architects who have already carried out churches in Ireland were invited to send in designs for the Roman Catholic Church which the Rev. CANON WHITE is about to erect in Nenagh, co. Tipperary, and which is to cost 20,000*l*. The qualities of two of the designs were so equivalent, it was decided to submit the drawings to Mr. DREW, R.H.A. He also was puzzled to decide which deserved preference. No. 1 he estimated to cost 22,500*l*, No. 2, 23,120*l*. No. 1 appeared to Mr. DREW as "the perfection of that fine type of Catholic church which has been developed in Ireland in the latter part of this century," but his own preference was for No. 2, on account of "its recurrence to more ancient and traditional treatment of style than obtains usually in modern church building." Eventually the design by Mr. WALTER DOOLIN, M.A., of Dublin, was selected, and the second prize of fifty guineas was awarded to Mr. G. C. ASHLIN.

THERE are many topics in Colonel HAYWOOD's report on the works executed by the Commissioners of Sewers which are worth notice. The drainage could not be extensive, but it is noted with satisfaction that two ventilating flues were carried up in connection with the City Bank, Ludgate Hill. Although the Commission since 1884 have been trying to construct them, it is owned that "very little hitherto has been done in such constructions, there being the greatest difficulty in inducing owners of property to consent, and in some cases exorbitant rents have been demanded." Street improvements are not easily carried out owing to the value of land in the City. But the removal of Sam's Coffee-house, in King Street, Aldgate, enabled the street to be widened by at least 6 feet. In rebuilding premises in the Minories, near Aldgate, an encroachment was made beyond the line of improvement sanctioned by the Commission. The new buildings were of a very substantial character, and the encroachment was not discovered until they were completed and the hoarding removed. The buildings were ultimately permitted to remain on the delinquent paying a fine of 500*l*. It is reported that the widening of Ludgate Hill is now completed, after a lapse of twenty-eight years. It is said that projecting sign-boards have of late years become very numerous in the City. A report upon them was prepared by Colonel HAYWOOD, and amended regulations were subsequently issued in respect of them. The contest between gas and electric power for street illumination continues. The gas lighting in the main thoroughfares was discontinued from time to time as the electric lamps were put into operation. The gas lamps and fittings, however, were not removed, arrangements having been made with the gas company for cleaning and maintaining the lamps ready for lighting to meet the contingency of failure in the electric light. The number of gas lamps unlit at the end of the year was 1,126, the number of arc lamps lighted being 409; 275 gas lamps were extinguished for each arc lamp. Colonel HAYWOOD having required the electric light company to place experimentally glow lamps within the gas lamps in such manner as to leave the gas available in the contingency of failure, the gas company raised various objections to that being done and stated their intention of removing the gas fittings when the glow lamps were placed inside the lanterns. The question was still under consideration of the Streets Committee when the report was issued.



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April 14th 1893.



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ROGUE: THE GREAT HALL.
GARNER, Architects.



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HEWELL GROVE, BROMS
Messrs. BODLEY

14th 1893.



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VE: THE GREAT HALL.
NER, Architects.

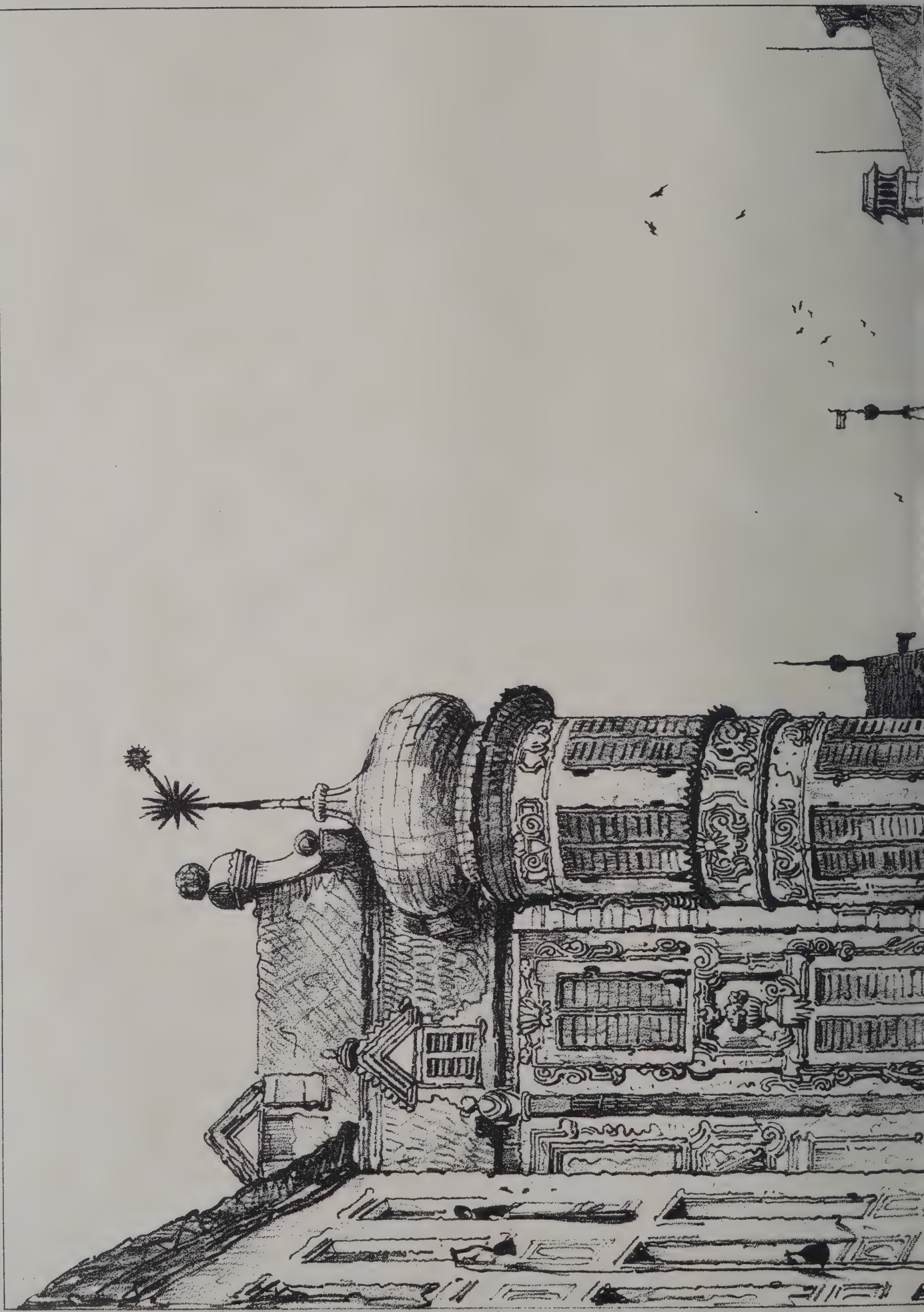




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RATISBONNE.
Drawn by SAMUEL PROUT.

ILLUSTRATIONS.

HEWELL GROVE, BROMSGROVE: THE GREAT HALL.

(TWO-VIEWS.)

MESSRS. BODLEY & GARNER, ARCHITECTS.

RATISBONNE.

THE ANGEVINE CHURCHES.

THE architecture south of the Loire is different from that of the northern part of France. The northern architects aimed at height, the southern at breadth, their object seeming to have been to cover the greatest possible space with a stone vault without pillars or arches.

According to some well-informed French antiquaries, says the late J. H. Parker, the original type of these peculiar churches was the cathedral of St. Frond at Périgueux, and this is said to have been built by a Venetian colony very soon after St. Mark's at Venice, or between 976 and 1047. The very massive character and extreme plainness of that building agrees very well with the early date assigned to it, and the use of the Pointed arches to carry the cupola may be accounted for by its Eastern origin. However this may be decided, the general character of these buildings is clearly Byzantine; each bay is square and covered by a domical vault or cupola, in some cases lofty, in others nearly flat, and concealed externally by the roof.

Mr. Parker's impression was that these churches were generally of the twelfth century, and he found in the same district another description, also of very fine character, which appeared to be of the eleventh. The latter are of the usual plan, with narrow aisles, barrel vaults and massive round arches, the capitals and bases and the general character of the work agreeing with that of the eleventh century, as for instance with the churches at Caen of the time of William the Conqueror. But some in Poitou are much larger and finer than are to be found elsewhere of that period. May we venture to conclude that this part of France was in a very flourishing state in the eleventh century, and its architecture consequently in advance of other parts?

This state of prosperity appears to have continued through the twelfth century and then to have suddenly ceased. Scarcely any churches appear to have been built between the twelfth and the end of the fifteenth century. This interval exactly agrees with the period of the English dominion, which seems to have been a continual struggle, and the constant state of civil war was not favourable to the building of churches.

The cathedral of St. Maurice, at Angers, is a very striking and important building; the earliest part is the nave, which is of about the middle of the twelfth century. It is 54 feet wide and 80 high, divided into bays or compartments, which are nearly square, and each is covered by a domical vault, not a plain dome, but the central point is the highest, and the ribs, which are square and enriched with the zigzag, meet in this central point; they are on the groins, the space being divided into eight cells. The bays or compartments of the church are separated by massive square-edged arches, which are slightly pointed, and are carried on enormous buttresses, about 10 feet square at the sides and 14 feet at the angles; whilst the cornice or corbel-tables and strings are carried round them, so that they form rather a thicker part of the wall than buttresses in the ordinary sense. Between each pair, or in the side-wall of each compartment, is a low pointed arch, recessed in the wall, springing from the bases of the piers, and carrying the triforium gallery at about half the height of the walls. The windows are entirely above this gallery; they are round-headed, in couplets, and filled with very fine original glass of the twelfth century, very similar to that at Canterbury. The inner face of the square buttresses is ornamented with shafts, having capitals and bases of Norman character: these carry the transverse arches and the ribs, and complete the design; the triforium gallery is supported by a Norman corbel-table. The west front of this church is very fine and rich, though somewhat spoiled by alterations at the period of the Renaissance. The central doorway is perfect, its jambs and tympanum filled with fine sculpture, the figures of the stiff Byzantine character. The rose-window has been destroyed and the arcades mutilated, and in the upper part a range of figures under canopies, and a sort of cupola of the Renaissance style, have been introduced in the place of the original gable. The two side towers remain, and have rather good flamboyant spires added to them. The next part of the church is the choir with its apse, which are of more decided Transition character, and belong to quite the end of the twelfth century; while the transepts, though still partaking of the Transition character, are said to have been built as late as 1240. There is a fine rose-window at the end of each transept; the southern

one is the earliest, and of plate tracery. Flamboyant chapels have been added on both sides of the nave near the west end, and there is a cloister of late date on the south side joined on to one of these chapels. Both the cloisters and chapels appear to have been rebuilt on older foundations. The vaults of the choir and transepts have round ribs instead of square. There is some fine original ironwork on the west door.

The church of Ronceray, in Angers, is said to have been founded by Foulques, Earl of Anjou, in 1025, and dedicated to St. Mary the Virgin in 1028, and re-dedicated in 1119 by Pope Calixtus II. It is evidently one of the oldest churches in Angers, and a very fine example of the early type; it is not of Byzantine character, but its plan at present is a simple parallelogram with a plain barrel-vault. To compare great things with small, it bears considerable resemblance to the chapel in the White Tower in London; the details also agree in character with the churches of William I. at Caen. All the capitals have the small volutes, in imitation of Corinthian; and the central piece for the caulicoli is in many left uncarved, a very common feature of the eleventh century. Some, however, are more elaborately carved, as in those of the Holy Trinity at Caen; but, in both instances, the sculpture is probably somewhat later than the rest of the work.

The vault in the church of Ronceray is carried upon plain square-edged transverse arches of semicircular form, and has no other ribs. The windows are plain, round-headed (mostly blocked up); the vaulting shafts are half rounds, and have the capitals before mentioned; the windows are all in the upper part of the wall above a string, below which the wall is plain; the shafts are all cut off at about one-half their length, and have modern corbels. It had originally apses, aisles and transepts, which were destroyed in the last century.

The ruins of the church of St. Laurent, Angers, near to that of Ronceray, are of similar character, though not, perhaps, quite so early. The plan is cruciform, with an apse to the choir, and an apsidal chapel on the east side of each transept. The vaults are destroyed, but the greater part of the walls remains. It is chiefly of slate, the principal building material of the district, but there are tiles mixed with it. The windows have shafts, the capitals of which are of rather a Greek character; the work shallow, but with volutes in the angles. The masonry and the character of the work is very rude. The vaults of the transept apses remain, and are of the half-dome form, constructed of small square stones in regular courses. The vaulting shafts and springing of the transverse arches show that the other vaults were barrel-shaped, like that of Ronceray.

Another ruined church of great interest from the character of antiquity and the peculiar features it possesses is St. Martin, Angers. The plan is cruciform with a central tower and without aisles; the walls of the original portions are built of squared stones in layers, alternately with layers of tiles, three rows together, having an equal thickness of mortar between each row, exactly as in Roman work. The nave is in ruins and has lost its vault; the central tower is tolerably perfect, and is vaulted with a dome. The piers of this tower are constructed in the manner just described, but they have imposts exactly like the usual Norman impost. There are large shafts in the angles with capitals of the character of the eleventh century, and on these rest small shafts carrying the angles of the vault—an arrangement common in Norman work. The arches are plain semicircular with flat soffits, the dome has a plain surface without ribs. The transepts are of the same style as the central tower. The choir is considerably later and is of Transition character. The vaults domical with square ribs. The apse is still later and almost of early French style, but the vault here has round ribs. All these ribs are enriched with ornament. Monsieur De Caumont states that the nave and transept of this church are parts of the structure erected by the Empress Hermengarde in the beginning of the ninth century, and considers it as a precious fragment of the works of the Carolingian period (now extremely rare).

Trinity Church, Angers, is a very remarkable church, chiefly of Transition character. The nave is wide and has a series of semicircular recesses for altars down the sides vaulted with half domes; the arches pointed and very much enriched with a great variety of late Norman ornaments. The nave itself is vaulted by a series of cupolas or low domical vaults, each divided into eight cells, as at the cathedral. The eastern part or choir is divided into three portions, the choir itself, with two aisles, each having an apse. This triple apse has a fine effect on the exterior. Over the central division is a small tower or square lantern with a cupola. The windows are all plain and round-headed; the arches all pointed and enriched with ornament. The windows of the nave are pointed and more of early French character. At the north-west angle of the nave is an older tower partly in ruins, and clearly of the character of the eleventh century, with a barrel-vault and capitals to the shafts, similar to those of the church of Ronceray, which almost joins on to it; a small part of the wall of the nave is of the same age and work as the tower. The old church to which

this belonged was evidently much smaller and lower than the present one. Part of the surface of the wall of the old work is formed of small diamond-shaped masonry. This church is said to have been commenced in 1062 and completed in 1092; these dates agree very well with the character of the tower and the small portion of the original tower that remains. The present church is about a century later.

In the cloisters of a modern building at Angers, that is now the prefecture but was formerly an abbey, are some remains of the original cloister, which were long entirely concealed under a thick coat of plaster. The work is in very fine preservation. It consists of an arcade of Norman work. It is almost unrivalled, even at that period of rich and elaborate work, the middle of the twelfth century, to which it belongs. In several parts the original painting remains more or less perfect. The tympanum of one arch especially is quite perfect, and very curious from the combination of sculpture and painting. In the crown of the arch is a figure of Christ sculptured and coloured, and the figures form part of the same composition with the painted figures on the flat surface of the wall. These are small groups of Scripture subjects: the Epiphany, the Offerings of the Magi, the Flight into Egypt and the Judgment of Solomon. The drawing of these figures bears a remarkable resemblance to the Bayeux tapestry.

The wall of the original cloister is 5 feet 6 inches thick, pierced by a series of small round-headed arches enriched as described.

The Hospital of St. John, Angers, was commenced by Henry II., King of England and Count of Anjou, the year after his accession to the English throne, or in 1156, and the buildings are said to have been completed in his time. The hall is a fine building, divided into three aisles by very light pillars, carrying Transition pointed arches and vaults slightly domical. It is eight bays in length, each bay having a separate vault; there are, therefore, twenty-four of these small domes, but they are so low as not to interfere with the external roof. They have bold round ribs on the groins of the eight cells into which each dome is divided, as at the cathedral; but these round ribs occur only in the eastern part of the cathedral, which was built after 1200. The chapel is of precisely the same character and equally good, with very light pillars and vaults, as in the hall. The windows are all round headed. The doorways are also round-headed, but richly moulded with very late Norman work. The effect of the chapel has been much injured by altering the position of the altar, blocking up the original entrance, and making a new one in a bad situation. The east end is square, but the vaults are so arranged as to give the effect of an apse. The cloister is good late Norman, or rather Transition; two sides of it are perfect.

The barn is very fine and of the same period; it is divided into three aisles by two ranges of round-headed arches on double shafts. The windows are in couples, with a diamond-shaped opening in the head; the doorway is round-headed, and opens on an external stone staircase. The mouldings are of late Norman character. The cellar under it is large, but very plain, with a good plain vault. The other buildings of the monastery are modern.

St. Serge, Angers, is a church of late Transition character, almost early French, with a strong resemblance to the Hospital of St. John. The plan is cruciform, with short transepts, scarcely projecting, and with aisles to the nave and choir. The most striking feature is that the choir has two rows of tall, slender pillars to carry the vault, independent of the piers and the arches which separate the choir from the aisles. These pillars are said to be 30 feet high by 1 foot in diameter. They have octagonal bases and capitals with foliage of the stiff-leaf character. The vaults are slightly domed and eight-celled, with round ribs meeting in a central boss, which is the highest point of the vault. At the east end is the lady chapel, which is square, with a flat east end; but the vaults arranged to give the effect of an apse, as in the chapel of the hospital. The piers between the choir and aisles are massive and square, with shafts attached, the arches pointed, the mouldings and vaults of the aisles the same as the choir; the windows are round-headed. The transepts are of similar character, but rather earlier, and have round windows of plate tracery at each end. The nave appears to have been originally of the same character, but has been entirely refaced in flamboyant work. At the west end is a large porch, with rather a curious double vault. There is a tower at the south-west angle, unfinished. The exterior is plain and poor.

The castle of Angers is large, of striking appearance and well placed. It is distinguished by an amazing number of massive round towers at short intervals. The material is slate of a dark colour, with layers of white stone at regular intervals, after the fashion of the layers of tiles in Roman buildings. It was commenced in the thirteenth century, under Philip Augustus, but not completed before the fifteenth, under Louis IX.,* but from the extreme plainness of the work

generally it may be of any age. Part of the work must be of the sixteenth century, as the embrasures are evidently made for cannon. There is a small portion of the Roman wall remaining in the open space near the castle. It is faced with small squared stones, with layers of tiles at intervals, as usual.

The tower of St. Aubin is a fine structure of the thirteenth century, and a good specimen of the early French detached towers. The buttresses rise from the ground on all four sides, and it has never had any other building attached to it; the windows are lancets, and the details are all of the same style.

The ruins of an early French church of the thirteenth century, All Saints, Angers, now belong to the museum; the vaults are destroyed, but the walls remain nearly perfect. The plan is cruciform, without aisles; the windows are lancet-shaped, with shafts having capitals with the stiff leaf foliage and round abacus. The east window is a wheel of plate tracery, but of flamboyant work. The vaulting shafts are terminated on the canopies of figures of the same periods. This is also the case with the vaulting shafts of the choir of St. Martin's, which is nearly of the same character. There is a curious double font, oblong, with two basins, carried on an arcade of early French character. It stands in the north transept and is said not to have been moved. Several good tombs and other fragments of Roman and Mediæval work are preserved here, the ruins having been attached to the museum which is at a short distance from them. This museum is a fine flamboyant house with a good staircase, having a curious and very elegant vault at the top. There are a great number of good old wooden houses in Angers of the sixteenth and seventeenth centuries and several of stone also. One called the House of the Merchants, near the river, is attributed to the thirteenth century, but is really plain flamboyant work of the fifteenth or sixteenth.

St. Peter, Saumur, is a fine church of the period of Transition, cruciform, with a central tower, an apse to the choir and apsidal chapels to the transepts eastward. The choir is very narrow and the apse has only a single window, large and round-headed; the vault is a plain semi-dome, but the vault of the choir has flat ribs and the transverse arches are pointed; the vaults are of the eight-celled flat domical form as at the cathedral and the Hospital of St. John at Angers. The transepts are also narrow; the apsidal chapels have semi-dome vaults without ribs. The nave is wider and has no aisles, but side-chapels, which are not original. The vaults are of the same character as those before mentioned. The windows are all round-headed externally, but very large, and some of the inner arches are pointed. The transverse arches are all pointed and square in section. The capitals are very rich with foliage of late Norman character. The church is so constructed that each bay from the west is smaller than the preceding, the eastern bay being very much narrower and smaller than the western; this seems done for the perspective effect only, to make the church appear larger. The exterior of the church is of the usual Angevine character, and shows very clearly the Transitional date. The apses are very distinct and have round buttresses. The tower by itself might be called early French, but it is all of the same period. There is a rich late Norman doorway on the west side of the south transept. The west front is of the seventeenth century. The tooth-ornament is used in the dripstones and in some other situations. There are arcades of panelling along the surface of the walls both internally and externally.

St. Nicolas, Saumur, is a small church of the usual Transitional character. It consists of three parallel aisles of nearly equal width and height, five bays in length, each bay having a vault of the eight-celled domical character; the arches are pointed. The chief peculiarity of this church is that the altar has been removed from the east end to the west and a modern choir built for it, while the original apses at the east end have doorways pierced in them. This change has obviously been made for convenience, because the church is situated at the western extremity of the town.

The Hôtel de Ville is a small but very good flamboyant building with fine machicolations on the exterior; these have trefoils between them, and add much to the picturesque character. The interior court is richer and also good in its way.

At Candès, near Fontevault, is a fine village church on the south bank of the Loire, of the same late Norman and Transitional character which prevails in the neighbourhood. The plan is the usual one but good and well marked; the choir has a considerable decoration towards the north. The west front is a fine example of Transition work approaching more to the early French character. There are two square corner turrets, which have machicolis at the top, evidently intended for defence. The west doorway is small, of early French style, deeply recessed, having five shafts on each side, and the arch well moulded. Over this doorway is an arcade resting on a corbel-table. The buttresses on each side of the doorway are almost turrets, square at the bottom, octagonal above, and terminated by small spires against the wall of the west gable, with a circular window between them. On the north side of the nave is a very remarkable porch with a room over it as

* De Caumont, "Bull. Monumental," ii. 330.

high as the nave itself, and defended by machicoulis. The vault of the porch is supported by a central pillar like a chapter-house; the work is unfinished in several parts. There are niches in the front, some of which have figures in them; others the plain stones, not carved, showing the practice of carving the figures after the stones were placed, which may be observed in many other instances, but seldom so distinctly as here, some having the figures carved and the pedestals left unfinished. The windows on this side the nave are of enormous length and very narrow; the height is fourteen times the width; the heads are round. The nave has two aisles of the same height with the central division, and these long windows give ample light to all these divisions. The pillars are very tall, octagonal in plan, with clustered shafts having small capitals, each with square abacus and foliage. The bases are of early French character with the deep hollow to hold water and corner foot-ornaments.

Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

THE ARTS IN GREECE.

WHEN Emerson said, "In the Greek cities it was reckoned profane that any person should pretend a property in a work of art, which belonged to all who could behold it," he was no doubt thinking of the essay by Arnold Heeren, which was translated into English by Mr. Bancroft, the historian. The theory that the public can have any claim on the property of individuals, whether consisting of works of art, gold, houses or lands, was probably more repugnant to collectors of pictures and statues than to any other class of owners. But in modern England there is fortunately an admission of the advantage of the Greek principle, for costly works are nearly every year presented for the enjoyment of the people. It would be an advantage, however, if the future destination of their property could be foreseen by all such generous people when they started gathering works of art, for more care would be taken in the selection. But let us turn to Heeren:—

The encouragement of the arts is in our times left chiefly to private taste, and is greater or smaller according to the number of amateurs. The state takes an interest in them only to prevent their total decay or for the sake of some particular design. The case was entirely different in the period when they flourished among the Greeks. The arts with them were exclusively public and not at all an affair of individuals. They afterwards became so, yet never in the same degree as with us; nor even as with the Romans. These positions require to be further developed and more accurately proved. By the arts we mean the three great branches of them, architecture, sculpture and painting. On each of these we have some remarks to offer.

Architecture is distinguished from the two others by the circumstance that its object is use no less than beauty. Not only the moderns but the Romans of the later ages endeavoured to unite them both, and in this manner private buildings became objects of art. Among the Greeks a tendency to this seems to have existed in the heroic age. In the dwellings and halls of the kings there prevailed a certain grandeur and splendour which, however, we shall hardly be willing to designate by the name of scientific architecture. When the monarchical forms disappeared and living in cities, and with it republican equality gained ground, those differences in the dwellings disappeared of themselves, and everything which we read respecting private houses in every subsequent age confirms us in the idea that they could make no pretensions to elegance of construction. It would be difficult to produce a single example of such a building. But we find express evidence to the contrary. Athens was by no means a fine city like some of our modern ones, in which there are whole streets of palaces occupied as the dwellings of private persons. A stranger could have been in Athens without imagining himself to be in the city which contained the greatest masterpieces of architecture. The splendour of the city was not perceived till the public squares and the Acropolis were approached. The small dwellings of Themistocles and of Aristides were long pointed out; and the building of large houses was regarded as a proof of pride.* But when luxury increased the houses were built on a larger scale; several chambers for the accommodation of strangers and for other purposes were built round the court, which commonly formed the centre; but all this might take place and yet the building could lay no claims to beauty. If a town, which was, it is true, but a provincial town, may be cited to corroborate this, we have one still before our eyes. A walk through the

excavated streets of Pompeii will be sufficient to establish our remark. Where the pomp and splendour of the public edifices were so great as among the Greeks, it was not possible for private buildings to rival them.

Architecture, as applied to public purposes, began with the construction of temples; and till the time of the Persian wars or just before we hear of no other considerable public edifices. The number of temples remarkable for their architecture was till that time a limited one; although in the age just preceding the war with Persia this art had already produced some of its first works among the Greeks. In Greece itself the temple of Delphi was the most celebrated after it had been rebuilt by the Alcæonidæ. There was also the temple of Apollo in Delos. But it was about this time that the invention of the Ionic order by the Asiatic Greeks in addition to the Doric, which had been used till then, constituted a new epoch in the history of architecture. The splendid temple of Diana at Ephesus erected by the joint exertions of the cities and princes of Grecian Asia, was the first building in this new style. About the same time Polycrates built the temple of Juno in Samos. The temples which afterwards formed the glory of Greece, those of Athens on the Acropolis and elsewhere, were all erected after the Persian war. So too was the temple of Jupiter at Olympia. As to the temples in Lower Italy and Sicily, we can fix the epoch in which, if not all, yet the largest and most splendid of them, the chief temples of Agrigentum were erected; and that epoch is also subsequent to the Persian war. And if those of the ancient Doric order at Pæstum and Segestus belong to an earlier period, they cannot to one much earlier; as these cities themselves were founded so much later than those in Asia Minor. Just before and after the Persian war arose that prodigious emulation of the cities to make themselves famous for their temples, and this produced those masterpieces of architecture.

The other principal kinds of public buildings which were conspicuous for their splendour were the theatres, the places for musical exhibitions, the porticos and the gymnasia. Of the theatres, it has already been observed that they were erected subsequently to the Persian wars. The same is true of the halls for music. The porticos, those favourite places of resort to a people who lived so much in public, belonged in part to the temples, and in part surrounded the public squares. Of those in Athens, which by their works of art eventually eclipsed the rest, we know that they were not built till after the victory over the barbarians. Of all the public edifices, the gymnasia are those respecting which we have the fewest accounts. They were probably erected at a distance in the rear of the temples; though many of them were distinguished by excellent works of art.

This line of division, carefully drawn between domestic and public architecture by the Greeks, who regarded only the latter as possessing the rank of one of the fine arts, gives a new proof of their correct views of things. In buildings destined for dwellings, necessity and the art are in constant opposition. The latter desires in its works to execute some grand idea independent of the common wants of life; but a dwelling is intended to meet those very wants and is in no respect founded on an idea connected with beauty. The temples are dwellings also but the dwellings of the gods, and as these have no wants in their places of abode, the art finds here no obstacle to its inventions.

The plastic art and painting bore to each other, among the Greeks, the opposite relation to that which they have borne in modern times. The first was the most cultivated, and though the latter attained the rank of an independent art, it never was able to gain the superiority. It is not for us here to explain the causes of this; we need only mention one, which to us is the most interesting. The more public the arts are among any people the more naturally will the plastic art surpass that of painting. The works of both may be public and were so among the Greeks, but those of the former are far better suited for public monuments than those of the latter. The works of painting find their place only on walls; those of the plastic art existing entirely by themselves wherever there is room for them.

The works of the plastic art, statues and busts, were, in the times of which we speak (and among the Greeks, with a few limitations, even in subsequent times), only public works, that is, designed to be set up, not in private dwellings but in public places, temples, halls, market-places, gymnasia and theatres. I know of no one instance of a statue that belonged to a private man; and if there exists any example, it is an exception which confirms the general rule.* It may be said that it is only accidental that we know of no such instances. But if any taste of

* Demosthenes reproaches the wealthy Midias with his large house at Eleusis, which intercepted the light of others. Op. i. p. 565.

* Or can the anecdote be cited which Pausanias relates, p. i. 46, of the cunning of Phryne to gain possession of the god of love made by her lover Praxiteles? Even if it be true the fact is in our favour, for she consecrated it immediately as a public work of art in Thespiae, Athen. p. 591, in which city alone it was from that time to be seen. Cic. in Ver. ii. iv. 2.

that kind had prevailed at Athens we should find traces of it in the comedians and orators. If these are consulted in vain for such indications, we are justified in concluding that no such private tastes existed.

Phidias and his successors, till the Macedonian age, did not therefore labour to supply with their works the houses and collections of individuals. This by no means implies that they did not receive applications from private persons. If they had not the incredible multitude of statues which we have already mentioned could never have been made. This subject is so important that it demands to be treated of more at large.

The great masters were principally employed for the cities. These, or the men who were at their head (as the example of Pericles informs us), bespoke works of art or bought them ready made, to ornament the city and the public buildings. We have distinct evidence that the great masterpieces of Phidias, Praxiteles and Lysippus, owed their origin to this. Thus were produced the Jupiter at Olympia, the Minerva Polias at Athens by the first, the Venus at Cnidus as well as at Cos by the second, the Colossus of Rhodes by the third. Yet numerous as were the applications of cities, the immense multitude of statues could not be accounted for, unless the piety and the vanity of individuals had come to their assistance.

The first assisted by the votive offerings, of which all the celebrated temples were full. These were by no means always works of art but quite as often mere costly presents. Yet the collections of statues and pictures which belonged to those temples consisted, for the most part, of votive offerings.* But these were as often the tribute of gratitude from whole cities as from individuals.†

The vanity of individuals contributed to the same end by the custom of erecting statues, commonly of bronze, to the victors in the games.‡ When we remember the multitude of these games in Greece, the number of statues will become intelligible, especially of those of bronze, of which in many instances more than one cast was made; as the native cities of the victors would hardly fail in this manner to appropriate to themselves the fame of their citizens, which formed so much a subject of pride.

Painting, from its very nature, seems to have been more designed for private use. Yet in the age of Pericles, when the great masters in this art appeared in Athens, it was hardly less publicly applied than the art of sculpture. It was in the public porticos and temples that those masters, Polygnotus, Micon and others, exhibited the productions of their genius. No trace is to be found of celebrated private pictures in those times.§

Yet portrait-painting seems peculiarly to belong to private life. This branch of the art was certainly cultivated among the Greeks, but not till the Macedonian age. The likenesses of celebrated men were placed in the pictures which commemorated their actions; as that of Miltiades in the painting of the battle in the *Pœcile* or pictured hall in Athens; or the artists found a place for themselves or their mistresses in such public works.|| But properly speaking, portrait painting, as such, did not flourish till the times of Philip and Alexander, and was first practised in the school of Apelles. When powerful princes arose, curiosity or flattery desired to possess their likeness; the artists were most sure of receiving compensation for such labours, and private statues as well as pictures began to grow common, although in most cases something of ideal beauty was added to the resemblance.

We have ventured directly to assert that the arts in their flourishing period belonged exclusively to public life; and were not, according to the general opinion, which seems to have been silently adopted, divided between that and private life.

* Not to mention Olympia and Delphi again, we refer to the temple of Juno in Samos, Strab. xiv. p. 438, of Bacchus at Athens, Paus. i. 20. The temple of Diana at Ephesus was so rich in works of art that, according to Pliny, xxxvi. 14, a description of them would have filled several volumes.

† The temples received such presents not only during the lifetime of the donors but as legacies. A remarkable instance of this is found in the will of Conon, who left 5,000 pieces of gold (*σφαίρες*) for that purpose. Lys. Or. Gr. v. p. 639.

‡ See the passage in Pliny, xxiv. 9. His remark that a statue was erected in honour of every victor at Olympia seems hardly credible. Cf. Paus. vi. p. 452.

§ It is true Andocides reproached Alcibiades in his oration against him of having shut up a painter who was painting his house, Or. Gr. iv. p. 119. But this was not the way to obtain a fine specimen of the art. Allusion is there made to the painting of the whole house, not of an isolated work of art; and we are not disposed to deny that in the times of Alcibiades it was usual to decorate the walls with paintings. On the contrary, this was then very common, for the very painter Archagathus gives as his excuse that he had already contracted to work for several others. But these common paintings are not to be compared with those in the temples and porticos; which, as Böttiger has proved, Ideen, &c., s. 282, were painted, not on the walls, but on wood.

|| Polygnotus, *e.g.* introduced the beautiful Elpinice, the daughter of Miltiades, as Laodice. Plut. iii. p. 178.

Be it remembered this is to be understood only of works of art in the proper sense of the expression; that is, of those which had no other object but to be works of art; of statues, therefore, and pictures; not of all kinds of sculpture and painting. That the arts connected with private wants were applied to objects of domestic life, to articles of household furniture, to candelabra, vases, tapestry and garments, will be denied by no one who is acquainted with antiquity.

It was not till a Lucullus, a Verres and others among the Romans had gratified their taste as amateurs, that the arts were introduced into private life, and yet even in Rome an Agrippa could propose to restore to the public all the treasures of the arts which lay buried in the villas. We should not therefore be astonished if under such circumstances the ancient destination of arts among the Greeks should have been changed, and they should have so far degenerated as to become the means of gratifying the luxury of individuals. And yet this never took place. This can be proved as well of the mother country as of the richest of the colonies.

Pausanias in the second century after the Christian era, travelled through all Greece and saw and described all the works of art which existed there. And yet I know of no one instance in all Pausanias of a work of art belonging to a private man, much less of whole collections. Everything was in his day, as before, public in the temples, porticos and squares. If private persons had possessed works of art who would have prevented his describing them?

Verres plundered Sicily of its treasures in the arts wherever he could find them, and his accusers will hardly be suspected of having concealed anything. But in this accusation, with one single exception,* none but public works of art are mentioned. What shall we infer from this but that no considerable productions of the fine arts were possessed by private persons in Sicily?

So deeply therefore was the idea fixed among the Greeks that the works of the artists were public, that it could not be eradicated even by the profanations of the Romans. And this is the chief cause of their flourishing. They thus fulfilled their destiny; belonging not to individuals but to cultivated humanity. They should constitute a common property. Even in our times, when individuals are permitted to possess them, censure is incurred if others are not allowed to enjoy them. But even where this privilege is conceded, it is not a matter of indifference whether an individual or the nation is the possessor. The respect shown to the arts by the nation in possessing their productions confers a higher value on their labours. How much more honoured does the artist feel, how much more freely does he breathe when he knows that he is exerting himself for a nation which will esteem its glory increased by his works, instead of toiling for the money and the caprices of individuals?

Such was the condition of the arts in Greece. When emulation arose among the cities to be distinguished by possessing works of art, a field was opened for a Phidias and Polygnotus, for a Praxiteles and Parrhasius. They were better rewarded by glory than by money; some of them never worked for pay.† Need we then add any further remarks to explain why the fine arts declined with liberty? Philip and Alexander still saw a Lysippus and an Apelles, but with them ends the series of creative minds such as no other nation has ever produced.

But the taste of the nation for the arts and their productions did not end with those artists. They had taken too good care to perpetuate that fondness. When the Grecians had lost almost everything else they were still proud of their works of art. This excited even in the Romans respect and admiration. "These works of art, these statues, these pictures," says Cicero, "delight the Greeks beyond everything. From their complaints you may learn that that is most bitter to them which to us appears perhaps trivial and easy to be borne. Of all acts of oppression and injustice which foreigners and allies in these times have been obliged to endure, nothing has been more hard for the Grecians to bear than this plundering of their temples and cities."

* Namely, the four statues which he took from Heius. Cic. in Verrem, ii. iv. 2. Yet they stood in a chapel (*sacrarium*), and were therefore in a certain measure public. The name of Heius seems, however, to betray that the family was not of Grecian origin. But what does one such exception and in such an age prove respecting an earlier period?

† Polygnotus painted the *Pœcile* for nothing; Zeuxis, in the last part of his life, would receive no pay for his pictures, but gave them away. Pliny, xxxv. 36. Thus a partial answer is given to the question how the cities could support the great expense for works of art. Besides, in Greece as in Italy, the works of the great masters did not become dear till after their death. The little which we know of their personal condition and circumstances, represents them for the most part as men of fine feelings and good fellowship who, like the divine Raphael and Correggio, in the moments sacred to mental exertion, raised themselves above human nature, but otherwise enjoyed life without troubling themselves much about money. Phidias for all his masterpieces did not receive a third part as much as Gorgias for his declamations.

We have thus far endeavoured to consider Greece from all the points in which she made herself glorious as a nation. Who is it, we may finally ask, that conferred upon her her immortality? Was it her generals and men of power alone, or was it equally her sages, her poets and her artists? The voice of ages has decided, and posterity justly places the images of these heroes of peace by the side of those of warriors and kings.

SOCIETY OF ANTIQUARIES OF SCOTLAND.

AT the monthly meeting, Mr. T. G. Law presiding, Dr. Christison, secretary, called attention to the subject of the geographical distribution of certain place names in Scotland—a subject which he believed would yield results of great importance in their bearings on philology and early history. As the basis of such a study a complete list of Scottish place names was necessary, and such a list did exist in the Ordnance Survey Office, but inaccessible to the scientific investigator, who was thus compelled laboriously to re-collect for himself materials which a comparatively small outlay for printing on the part of the Government might have placed within the reach of everyone desirous of utilising them. He had taken his materials from the 1-inch maps and divided them into three sections, according as they implied elevation, depression and situation or habitation. Of those implying elevation the word Ben, which was most frequent in the Highlands, occurred only in that part of the south of Scotland comprised in the hilly region of South Ayrshire and North Galloway, where it is pretty frequent, though it only occurs twice in Dumfries and once in Peebles, but disappears entirely in the Lammermoor and Cheviot ranges further east, and reappears again in the Ochils. Pen, on the other hand, as a hill name, is less frequent south of the Forth, and scarcely appears in the south-west corner of Scotland, where the Bens are clustered, while north of the Forth and outside of the Highlands it seems entirely absent. Dun, in its various significations and forms, is more widely, though unequally distributed, though almost absent in Orkney and Shetland. Fiold or field, unlike most other hill-roots, is almost always an affix, and the great home of the Fells, which is the most common form of the word, is in the south-west of Scotland. In the Hebrides it usually takes the form Val or Bhal. Bar is confined mostly to hills of low elevation, and is most frequent in Galloway, Ayr and Argyll, but in the whole of Eastern Scotland north of the Firth it scarcely appears. With regard to the roots implying depression, and applied to glens and streams, while Dal or dale was widely spread, as being derived both from Norse and Saxon, the central hill region of Peebles and Selkirk is the great home of the “hopes,” while “gill” is rarely found in the Highlands, but widely spread in Orkney, Shetland, Skye, Arran, and in Dumfries, Peebles, Lanark and Galloway, though its comparative infrequency in the Hebrides is remarkable. Lane, signifying a brook, is almost confined to the hill country round Loch Doon, from which they radiate into Ayr, Dumfries and Galloway, while “grain,” meaning a stream, is most frequent in Dumfries, and “beck” is most confined to Annandale. The paper concluded with a comparison of the distribution of the names Bal and Pit, applied to habitations, the latter of which though widely distributed to the north of the Forth scarcely appeared on the southern side of the Firth. After referring to the works of Sir Herbert Maxwell on the place names of Galloway, Professor Mackinnon’s articles on those of Argyllshire, he recommended the prosecution of the study so as to include the whole of Scotland.

Rev. J. King Hewison, F.S.A.Scot., Rothesay, described the numerous prehistoric forts of the island of Bute. These were sometimes of earth and sometimes of stones, and were mostly now very much destroyed. In Dun Sculpsay the doorway could yet be discerned, and near it is a promontory cut off from the land by fosse and fortified. All the stone forts have very thick walls, and some are vitrified. Dun Burgadal has its walls still standing 6 feet high, the wall being 14 feet in thickness. It has a gallery in the thickness of the wall. Dunagail, however, is the most important of the forts in Bute. Its gateway is distinguishable and its walls have been vitrified. The wall is 285 feet in length and at least 6 feet in thickness, and the stones are rather unequally vitrified. In one place the vitrification extends almost to the whole of the wall, which is at that part 5 feet 6 inches in thickness. The Fort of Islandbuie is also vitrified. Its remarkable feature is that it has round its oval outline the stances of four towers 14 feet in diameter at the four cardinal points. The number and importance of the forts in the island indicated a large population in early times.

Mr. George F. Black, assistant keeper of the museum, gave an account of Scottish amulets and charm-stones, of which a large loan collection from many different parts of the country were exhibited. The object of the paper was to describe in detail all the known Scottish specimens, which are much more numerous than could have been gathered from the existing literature of the subject. Some are balls of rock crystal, like

the Clach Dearg of Ardvourlich and the Clach na Bratach of the Robertsons of Struan, previously described by Sir James Simpson. Others are balls of stone, like that of the Bairds of Auchmeddan, and others are flint arrow-heads mounted in silver or pewter. The prehistoric beads called adder-beads and other varieties of personal ornaments not so very ancient, such as Luckenbooth brooches and whorls of stone, were credited with many virtues, and used in various ways to cure disease or avert the evil eye. The seeds of a West Indian plant wafted across the Atlantic and cast ashore on the coasts of the Hebrides were also mounted in silver and used as charms, one being shown which had been used for 200 years, and held in high repute for alleviating the pains of labour. The Cowan’s Taid-stane from Stirling and Barbreck’s bone from Argyllshire were noted charms, the latter famed for curing madness, and so highly valued that a deposit of 100*l.* sterling has been known to have been made as security when it was borrowed.

SIR JOHN GILBERT’S PICTURES.

THE *Birmingham Post* says the Mayor of Birmingham has received the following letter from Sir John Gilbert, P.R.W.S.:—“Vanbrugh Park Road, West Blackheath, London, Thursday, April 6, 1893. To the Worshipful the Mayor of Birmingham. Dear sir,—I have for some years past ceased to part with every picture I have painted, both in oil and water-colour, with the idea of building a gallery for their reception and giving them to the public; since which I have thought out another course of proceeding. Taking into consideration the permanent art galleries, especially those of the great cities of London, Birmingham, Liverpool and Manchester, and the lead which they have taken in all matters of art, I have determined to offer my collection to those galleries as a free gift. There are fifteen or more oil-paintings, some of considerable size, in perfect and pure condition and in handsome frames, and many water-colour pictures also framed. If possible, I should wish them in each case to be placed together. This matter, however, and other minor considerations, could be arranged afterwards. All these pictures have been exhibited at the Royal Academy and in the galleries of the Royal Society of Painters in Water-Colours, Pall Mall East, of which society I am president. A portion of my collection I beg to offer to the city of Birmingham Art Gallery. I am not well, and am dependent upon another for writing this for me.—I have the honour to be, your obedient servant, John Gilbert.” The Mayor has written to Sir John Gilbert accepting his offer, and expressing the gratification it will afford him to communicate it to the Council.

Sir John Gilbert, R.A., president of the Royal Society of Painters in Water Colours, lives, the *Westminster Gazette* says, in a roomy, old-fashioned house at Vanbrugh Park, on the borders of Greenwich Park. The house is literally crowded with pictures from Sir John’s brush, and these are all to be given to the nation.

“When I have finished,” the old artist said to a representative, “the house will be completely denuded. You know I have refused for the last dozen years or so to sell any of my pictures. I intended to possibly place them all in some gallery of my own, but that, I find, would be too much trouble. I want to see them hung properly before I die, so that is why I have offered my pictures without reservation to the various corporations.”

As I reached the house, the representative writes, members of the Corporation of London were driving away. I asked Sir John what was to be sent to the Guildhall. The artist pointed out the principal pictures to me. All have been exhibited, I believe, either at the Royal Academy or at the Water-Colour exhibitions. A cursory glance showed pictures bearing such far-apart dates as 1838 and 1891.

The Guildhall will ere long, Sir John told me, be enriched by such well-known pictures as his *St. George and the Dragon*, painted in 1880-81; *Henry VIII. and Cardinal Wolsey* (the scene taken from Shakespeare), painted in 1888; *Lancelot*, painted in 1886; and *Quixote’s Niece and Housekeeper*, painted in 1891. All these are in oils. Then in water-colours Sir John is going to give Londoners *Cardinal Wolsey on his way to Westminster Hall*, painted in 1886-87; *The Battle of the Standard*, painted in 1879-80; *The Knight Errant*, *The Witch* (a girl on a white horse), *War*, and *The Prince and Princess of Wales going to a Drawing-room*—all the work of recent years. Sir John Gilbert smiled as I recalled his popular style, “the Scott of painting,” but in answer to my query as to which picture he considered his best, he replied that he was unable to say—all were characteristic of him. With reference to the benefactions to provincial galleries, Sir John has not yet decided what gifts he will make to the Liverpool and Manchester Corporations. The former body, with commendable enterprise, had already sent a representative to Blackheath. By this time the artist’s friends were fearing lest he should over-weary himself, as he is unfortunately not in the best of health.

JACQUES LOUIS DAVID.

IT was only equitable that as Jacques Louis David had created a revolution in art, he also should in his turn be set aside. There was never an artist who was inspired by loftier ideas. He sought to recreate the heroic period of Greece and Rome in France, for he believed his countrymen were the legitimate heirs of the great men of antiquity; but during his lifetime he was compelled to see that his efforts were without avail. Frenchmen grew tired of posing as antique heroes, and although there must always be a close union between classicism and academicism in France, yet David's system became obsolete as soon as the Restoration took place. His career is, however, worth recalling.

David was born at Paris in 1750. At that period Boucher and his school still reigned in France. Success was certain to those who followed the beaten track. David quitted it, and, protesting against the taste of his masters and of the public, dared to study Poussin. The sight of the pictures which were then the fashion produced on him the same effect that *lettres de cachet* and the abuses of Government produced on Mirabeau—it inflamed him with the wish for a revolution. Accordingly, when Vien had given the signal of reform, and exhibited in his works a new style, David, eagerly following his steps, and it may be said appropriating his ideas, speedily found himself at the head of the reformers of art.

He had the qualities of the chief of a school: an ardent and enthusiastic temper, an energetic will. Unfortunately, to this soul of an artist was added the spirit of a logician. To constitute an accomplished painter, no doubt the force and power of a Michel Angelo are above all things necessary; but, in order to guide that force and that power, there ought to be a mind open to all ideas, fond of nature as she really is, observant but devoid of system; in short, such a mind as that of Leonardo da Vinci. David, on the contrary, was endowed with one of those intellects which are more vigorous than extensive, which are capable of a lively conception of things, but on the condition of embracing only a limited number of them, and which, having once adopted any action, are absorbed by it, and pursue it to its last consequences without taking the trouble to inquire whether or not it is consonant to truth. All that his mind was capable of conceiving, David had the gift of expressing on canvas with the superiority of genius. Hence the surprising beauties which strike us in his pictures. But his mind was not capable of conceiving enough. Hence his finest works are incomplete, cold, inanimate. Such a mind, united with such a temper, must of necessity produce a fanatic in politics, a mannerist in the arts. In the hall of the convention as well as in his painting-room the feelings of David were continually the dupes of his reason.

What had struck him most forcibly in the painters whom he wished to dethrone was their incorrectness of drawing, and their systematic inattention to the human form. Pretending to be faithful to nature, they were guided only by fashion. All their mouths smiled and all their noses turned up. The disposition of David's character naturally drove him into the other extreme. From the moment that he began to attend to form he thought of nothing else. With the soul within, with that internal power of which form is only the envelope and the manifestation, he did not trouble himself. "The body of man is the whole man," was his motto. Very soon Poussin did not satisfy him; he must have something more decided, more absolute. The ancient statues attracted his notice. In them he discovered that purity of line and contour, that beauty, altogether external, to which he aspired; and thenceforward, without disturbing himself to inquire if the real object of the art was not escaping him, he endeavoured to make his pencil the rival of the Greek chisel.

This is not to say that he abstained from the study of nature. Long and painful labour had disclosed to him all the secrets of anatomy; he constantly painted in the presence of living models, but these studies were not made by him for their intrinsic value. Nature never seemed to him to be an authority entitled to all his confidence; she was too various, too changeable. Even while affecting to imitate her, he subjected her to the control of those abstract types which he regarded as forming the law of beauty. A strict adherence to nature, he was apprehensive, might betray him into that arbitrary and capricious style of design with which his predecessors were justly reproachable. His mind could find no repose but in some predominating idea, in some system, or in the centre of feelings and doctrines. This explains the defective manner in which he saw nature; he studied her only as she contributed to, and never when she contradicted, his system.

Having entered on this new path, all his powers were concentrated in a single point. David arrived at his object with giant strides; his first efforts were most masterly, all the innovations which he had been meditating he realised at once, and carried them to the highest perfection. The *Horatii*, the

Brutus, the *Belisarius*, are finished models of that simple and severe style, of that dignified design of which, until the period of their production, antiquity alone had exhibited any example. It is impossible to convey any notion of the enthusiasm with which these *chefs-d'œuvre* were received. At another period, perhaps, the admiration which they excited would have been mixed with censure; but at the time at which they made their appearance the public mind was not in a condition to love or hate by halves; exclusive in politics, it was exclusive in everything else. Delighted with David for the kind of beauty which he had elicited, critics declared that it was the true beauty—that it was the only beauty. Good taste seemed to have been recovered, and the golden age of painting to be about to be renewed; a sort of idolatry for ancient forms possessed every one—it was one of the crises of the Revolution. It may be imagined with what unanimous contempt the works of those unfortunate painters were treated which were before the objects of general admiration; they were devoted to public indignation, with all the rest of the ancient régime; and yet in those tasteless compositions, if there was no real merit, at least there was a good intention, which ought never to be despised—the intention of imitating life. No consideration, however, could rescue them from their fate. Even the Italian painters, who had been banished to the garrets ever since the times of the Marchioness of Pompadour, did not gain much by this reaction. Some admirers they certainly found among the persons who had just been reading Lessing's "Laocoon," or who instinctively felt that the laws of painting and the laws of sculpture were not exactly the same, but in general their beauties were in little estimation—"they had not sufficiently studied the antique."

Now that we are more tranquil, that we feel the imperfection of former systems, and begin to understand that a country may be a republic without the assumption of Roman names and habits, and that the beauty of the antique is not the only possible beauty, David's pictures have, in some degree, lost one of their merits—the merit of circumstances. Nevertheless, such is the power of the hand by which they were created that it is impossible to contemplate them without that feeling of respect which is inspired by all works of genius. We cannot sympathise with beings whose features seem incapable of human emotion; we cannot but remark in the way in which they are disposed something too symmetrical, too analogous to the grouping of a bas-relief; but it is impossible (unless we are prejudiced by the opposite system) not to be struck with the harmony of all the parts, with the unity of conception which manifests itself in the smallest details, with the forms, ideal it is true, but having reference to a pure and perfect type. The pleasure with which a picture by David is contemplated is of that rational kind which accompanies the perusal of a Classic tragedy. In either case the work ought to be regarded in the point of view in which the author intended it to be regarded. If you stop before the *Horatii* or before the *Sabines*, just after having been looking at a head by Guido, or a Madonna by Correggio, all that portion of your soul which has been powerfully excited by the animated and passionate expression of the Italian painter will find nothing to interest it; you will feel frozen; in vain will reason call on you to admire the beauties which it has produced; you will exclaim, "These pictures have no expression," and you will pass by with disdain. But turn your eyes from nature, such as she is; dream, as David did, of beings colder, more severe, less impassioned than human; imagine that this *Horatii*, this *Brutus*, this *Leonidas*, were discovered amidst the ashes of Herculaneum—and then, having become less urinous in your demand, you will become more just; you will admire the beauties which the absence of other beauties prevented you from sooner observing.

It is only in this way that we can fairly judge of men who have employed their genius in the service of a system. It is thus that Alfieri must be read; it is thus that we must listen to the music of Glück. Alfieri, Glück and David, three great artists, three powerful minds, must nevertheless be admired for qualities somewhat foreign to the arts which they cultivated. Glück often said, "When I compose, I endeavour to forget that I am a musician." It was not music, but declamation which he wished to produce. Alfieri, although a dramatic writer, was jealous only of the title of a poet or a thinker. David, likewise, seems sometimes to have exclaimed with Glück, "Let me forget that I am a painter."

After all, however, we shall ill appreciate David's talent if we believe that he was invariably the slave of his system. He excelled in certain kinds of expression. No one has represented better than he the reflecting courage, the strength of mind, which shows itself in the warrior seated on the left of Leonidas. And in the picture of the *Sabines* what can be more graceful and more animated than the group of children? What can be more sweet and more tender than the daughters of Brutus? He has proved also that he was capable of quitting ideal nature: witness his magnificent design of *The Oath of the Tennis Court* and, above all, the clerical group in the picture of *The Coronation*, in which the Pope and all the ecclesiastics

who surround him are absolutely alive. It is nature taken in the fact.

After his banishment David gave his talent a new direction, and turned his attention to colouring. On the two pictures which he sent to France, *Cupid and Psyche* and *Mars and Venus*, he may be said to have lavished all the riches of the Venetian palette. But, according to the custom of exclusive minds, he acquired one quality only by the loss of another. These two pictures do not everywhere possess the severe taste and the pure and elegant drawing of the author of the *Horatii* and *Leonidas*.

Although absent from Paris, David during his life preserved a sort of empire over the school of painting. French artists, indeed, every day made attempts to pass the line which he had traced for them, but his name was still venerated. Among his pupils were Lathière, who was for ten years director of the Academy at Rome, and who with all his power endeavoured to make David's principles prevail in France; Drouais, who might have been the best exemplar of the school, but he died in his twenty-fifth year; Gros, who vacillated between David's style and romanticism; and Gerard, who preferred French to Roman history.

CHURCH BUILDING IN IRELAND.

THE erection of a church suitable to the requirements of the prosperous and improving town of Nenagh has been in contemplation for a considerable period of time, the present edifice being a queer old relic of penal times, situated in an out-of-the-way, damp, low-lying locality, most inconvenient of approach, and in every way unsuitable. Years ago the late Dr. Flannery, bishop of the diocese, conceived the idea of converting the old Norman donjon tower of the Butlers, known as "Nenagh Round," into a belfry, with the intention of building a church alongside of it. A storey was added to the tower, in bad keeping; but, apparently, it never was roofed, and the project of erecting the church remained in abeyance. The present pastor, Dr. White, on his appointment to the parish, set to work. A collection was started, a site acquired, and the foundation-stone was laid in due course. Subsequently competitive designs were invited from four architects, well known in connection with ecclesiastical works. As a result two designs described by expert authority as of exceptional merit were laid before a committee of selection consisting of Dr. McRedmond and Rev. Dr. White, with the president of the Royal Institute of the Architects of Ireland, Mr. Thomas Drew, R.H.A., acting as professional assessor. This gentleman drafted the "conditions of competition," which were of an unusually stringent character, and his estimate of the comparative merits of the plans was submitted in a comprehensive report. The condition of anonymity was observed, the plans not being identified by even the usual motto, but instead were distinguished respectively by the referee himself as "No. 1 'Red' plan," "No. 2 'Black' plan." Mr. Drew opens by congratulating those interested in building a fine church for the town on the worthy response to their invitation by the tender of two masterly designs for a noble church, with the thought, care and skill bestowed on splendid draftsmanship in setting them worthily before them. He considered that in ritual fitness there was little to choose between the two, but that in architectural treatment, however, there was very marked and characteristic divergence. Both designs were capable of erection for the amount named, viz. 20,000*l.*, but the referee held that neither gave sufficient floor, but the successful competitor has fully succeeded in satisfying his committee on the point. No. 1, he says, is the perfection of that fine type of Catholic church developed in Ireland during the later part of this century. While bearing a resemblance to others, this appears to surpass most in architectural study and completeness. The referee proceeds with his review of the other design as follows:—"May I, however, not be deemed inconsistent in saying that my personal sentiment and preference are with No. 2. I have said that in disposition and convenience for ritual both designs are very similar, and, therefore, on all fours in that respect. The attractiveness for me in No. 2 lies in its recurrence to more ancient and traditional treatment of style than obtains usually in modern church building, and to which my sympathies and sentiment lean. I like this design for its quality and reflection of the grand Cistercian school of the thirteenth century in these countries. I prefer its square-ended sanctuary as more native in tradition, and an agreeable variety from the more foreign apsidal one which, however beautiful in itself, appears to me to be becoming accepted and invariable in Ireland. I like the superior massiveness of walls and piers, suggestive of old and noble work; I like the simplicity and dignity of features imitated from the old Cistercian manner; I prefer the long drawn effect of a five-bayed nave to a four-bayed one. The tower, too, *per se*, is, I think, a better composition than that of No. 1. If two churches were erected according to these designs I could cordially admire both for separate qualities, but I should linger longest and with most personal gratification with No. 2." Then

he proceeds to say that sentiment should not weigh with him in the selection of a design, but that perhaps it might weigh with those for whom the church was to be erected; that they were, therefore, free to choose, on the one hand the modern type of church, or on the other hand the revival of an older style. The result was the selection of the design of Mr. Walter Doolin, M.A., architect, Dublin, to whom the execution of the work has been entrusted.

BRITISH INSTITUTE OF PUBLIC HEALTH.

EXAMINATIONS for sanitary inspectors were held by the British Institute of Public Health on the 7th and 8th inst., in the State Medicine Department, King's College, London. The examinations were arranged as follows:—Friday afternoon, preliminary examination in composition, arithmetic, &c.; Friday evening, written examination in building construction, chemistry and physics in relation to sanitary work, legal enactments, and general duties of inspectors; Saturday morning, inspection of two houses, and candidates' reports thereon; Saturday afternoon, oral examination. The examiners were S. R. Lovett, L.R.C.P., medical officer of health, St. Giles, president of Metropolitan Branch of Society of Medical Officers of Health; Dr. B. H. Murby, M.D., D.P.H., medical officer of health and public analyst, Portsmouth; Professor Bannister Fletcher, F.R.I.B.A.; H. Mansfield Robinson, LL.D., vestry clerk, Shoreditch, and chairman; Professor W. R. Smith, M.D., D.Sc., medical officer of health and public analyst, Woolwich. The report of the examiners will be presented to the Council of the Institute at its next meeting.

MR. VICAT COLE, R.A.

THE death is announced of Mr. Vicat Cole on Thursday, the 6th inst., at his residence at Little Campden House, from sudden failure of the heart's action. The *Daily News* says:—Only last Sunday he was showing his picture to his friends—the picture we shall all look at with mournful interest when the exhibition opens. His loss indeed is great, and in a sense one not likely to be replaced. Alike in his sympathies and his subjects, he was thoroughly English. He loved the landscape which he studied so carefully and painted so well. No artist of this generation has given us, as he has done, its thoroughly sunny character, the leafiness of its woods, the fat luxuriance of its meadows, the richness of its grain fields, the bushy beauty of its hedgerows, the security and the picturesqueness of its homesteads. His earlier work gave no promise of this achievement. The dry metallic art of Creswick and of Lee was there as an influence in his student days, and he learned, from their work, as indeed from his own father's, what it had to teach him, but he soon emancipated himself from these restraining models, and his popularity was immediate. Year after year in those old rooms, on the north side of Trafalgar Square, he exhibited his Surrey cornfields, with their yellow grain ripening in the blaze of the sunshine, or gave us a bend of the Thames, with the tall poplars and the smooth water above the weir. Half the secret of his popularity was his sincerity. He was always impressed by his subject, and he painted it "as though he loved it." And in his work he spared neither pains nor time. He was not what was called "clever;" there is no smartness in his work. He was too thorough to be clever, and therefore he was no considerable producer. He was always at his work, and yet there is not much of it to represent an art life which began at twenty—began, indeed, at eighteen, for his first exhibited work was in 1851—and continued without interruption for forty years; for Vicat Cole never considered the market. His popularity for the last thirty years was such that he could readily have got commissions for twice as much as he painted. He had a Londoner's partiality for the Thames. He knew the river from above Oxford, where it is a stream, to below London Bridge, where it widens into the Pool. And he knew its boats and its shipping off by heart—its gay-coloured lighters, its barges, loaded to the brink of the muddy water, its steam-tugs, darting mischievously about, its great ocean-going liners—he painted them all with the knowledge of a craftsman. It was his boast that he had been in a way the biographer of the great river. When he was sending *The Pool* to the Academy in 1888 he told the writer that it would be the last of the series. He had painted Richmond and Abingdon, and Wargrave and Streatley. But the temptation was too strong, and two years afterwards another great canvas was devoted to another great Thames subject, and it is a third Thames subject, a view off Greenwich, which this year received the last touches of his brush. It is curious that though he travelled a great deal and went over some of the ground which Turner had trod before him, it was always the Thames or the home landscape woods on the Arun or the slopes of Leith Hill which had for him a paramount attraction. He painted the Alps at Rosenlani and Marienburg on the Moselle, as he also painted Loch Scavaig in the Isle of

Skye, but there was not the feeling in these works which he knew so well to put into his Surrey pastorals and his autumn woods. Mr. Ruskin wrote of his *Richmond Hill* that some passages of subdued light seen under the trees were, in their studied perfection, about the most masterly things in landscape work in the whole exhibition. That was the exhibition of 1875, to which he also sent his *Iffley Mill*. Fifteen years before he had sent his first picture to the Academy; in 1870 he was elected associate, and ten years later attained the full honours of membership. Mr. Cole was but sixty years of age.



National Society for Checking the Abuses of Public Advertising.

SIR,—The disfiguring effect of certain forms of public advertising and the rapid growth of the evil have of late formed the subject of complaint and suggestion in many organs of public opinion. It may interest many of your readers to know that a society has been formed with the object of checking the abuses in question, and generally of protecting and promoting the picturesque simplicity of rural and river scenes and the dignity and propriety of our large towns.

Although it is hoped that all persons who are in general sympathy with the purpose will become members, it is provided that no person is committed to each and every feature of the scheme. The subscription is 2s. 6d. per annum, and the services of all the officers are honorary. The measures contemplated—subject always to the result of closer examination and more mature consideration—include:—

1. Such an amendment of the existing law as would confer on local representative bodies effective control over all forms of painted or printed announcements visible from the thoroughfares or public places, and would direct them to frame reasonable regulations, the regulations framed in pursuance of these powers not being necessarily uniform over the whole area, but varying according to the special character of distinct localities. In case of breach of the regulations relief to be obtainable on complaint of aggrieved persons. It is impossible to lay down beforehand any hard and fast rule as to the degree of prohibition. But no doubt it would be easy in many localities to secure a veto on sky signs, advertisements on chimneys and towers and parapets, hoardings and boards in fields, straggling posters and tablets on walls, gigantic hoardings, the more glaring defacements on town sites of particular historical or architectural interest or at picturesque rural spots—the sort of intrusions, in short, which the Laodicean judgment pronounces offensive. The “invasion of the country” by the defacer is felt by nearly everyone to be an outrage, and to repel it would involve the minimum of trouble and afford the maximum of relief.

2. The insertion in all bills giving legislative authority for the acquisition of land or construction of works of provisions either prohibiting or subjecting to appropriate regulation (as the case may require) the use of any portion of the fabrics for advertising purposes.

3. A common understanding that the members will each at his own discretion abstain (as far as may be) from using commodities which he personally feels are advertised in an offensive way, or patronising establishments which he regards as exceptionally unscrupulous in advertising display.

4. The policy of imposing a duty or special rate on all exposed advertisements as a form of local or Imperial revenue is under consideration.

Further particulars of the Society's plans with list of members may be obtained by written application to Richardson Evans, 1 Camp View, Wimbledon Common.—We are, &c.,

ALFRED AUSTIN.	WILLIAM BLACK.
W. H. FOWLER.	W. W. HUNTER.
JOHN HUTTON.	W. E. H. LECKY.
A. WATERHOUSE.	

Politics in Relation to Business.

SIR,—In last week's *Architect* was some allusion to the effect of political disturbance on architects' business in Ireland. Most architects I know are but now realising that it is absolute paralysis of their business. In my own and other offices, one by one, each and every undertaking started this season has been postponed or abandoned, an experience absolutely unprecedented. It seems strange to anyone who has lived a busy hurried life for thirty years to come to an office where no work is to be done, no correspondence to be read, and no callers. It is so in the general run of architects' offices. Business had been “drying-up” somewhat in anticipation during last year. With the introduction of the Bill has come collapse

of business, except to those of the profession who have a special corner in Roman Catholic church or convent building. The loss to the wage-earning class connected with building in Dublin will probably represent in the coming year not less than 100,000l. I estimate this from the amount of coming work abandoned in the last few weeks.—Yours faithfully,

ARCHITECT.

[The above letter has been received from one of the principal architects in Ireland.—ED.]

The Architectural Association.

SIR,—May we be allowed to remind your student readers that the lectures on “Professional Practice,” by Mr. Edwin T. Hall, F.R.I.B.A., commence on April 18, and Mr. F. W. Pomeroy's class on modelling on April 20? We shall be glad to receive as soon as possible the name of those desiring to enter, so that the necessary arrangements may be made.—Yours faithfully,

EDWIN S. GALE

F. T. W. GOLDSMITH

Hon. Secs.

56 Great Marlborough Street, W.: April 11.

GENERAL.

A Committee has been appointed to arrange for the holding of an exhibition of works in black-and-white at the Leeds Fine Art Gallery in the autumn.

The Mersey and Irwell Joint Committee have appointed Sir Henry Roscoe chemical adviser to the committee for twelve months, at a salary of 700l.

Mr. G. Fox, architect, Dewsbury, has been instructed to prepare plans for four cottage homes, at a cost of 550l. each, for children under the charge of the Dewsbury Guardians.

Mr. Lewis F. Day will deliver the second of the series of the Cantor lectures, “Some Masters of Ornament,” at the Society of Arts, on Monday, the 17th inst.

The Emperor of Germany will present the King of Italy with a statuette, modelled by Professor Begas, and representing a woman holding a shield bearing the motto “Savoya sempre avanti.”

Prudhon's *Saisons*, out of the Denain collection, have been sold in Paris for 80,000 francs, a portrait by Nattier for 42,700 francs, and one by Rembrandt for 41,000 francs.

Tintoretto's *Portrait of an Italian Nobleman* in the Doge's Palace, Venice, has been injured by some mischievous person. It was valued at 10,000l.

Alderman Gamble has presented to the Town Council of St. Helen's a plot of 1,500 square yards of land, with a sum of 20,000l., for the erection of a central library and reading-room and a school for technical education and manual instruction.

Mr. G. Herbert Strutt, of Milford, has sent a cheque for 4,000l. to the building fund of the Derbyshire Royal Infirmary, in addition to 1,000l. previously given by him for the same object.

Mr. Whitworth Wallis, the keeper of the Birmingham Art Gallery, has, says the *Birmingham Post*, reported to the Purchase Committee that he has inspected in Paris the Spitzer collection of objects of industrial art, and has selected certain specimens as worthy of being acquired for the Gallery. The committee authorised Mr. Wallis to negotiate for their purchase at prices which he named to the committee as in his opinion reasonable. The specimens in question are chiefly examples of the metal work of various nations.

M. Didier Debut, the French sculptor, died on Wednesday, the 5th inst., at the age of sixty-nine. He was a pupil of David d'Angers, and was the sculptor of a number of public works in Paris, including the statue of Ledru-Rollin and the caryatides of the Tribunal de Commerce.

Mr. A. McGibbon, president, at the monthly meeting of the Glasgow Architectural Association, Mr. A. N. Paterson, vice-president in the chair, delivered a lecture to the members under the title of “Some Minor Practical Building Details.” Interesting and instructive instructions were given on the many different items regarding principles of construction in connection with masonry, carpentry and joinery, iron work, &c.

Mr. John Malcolm, of Poltalloch, has presented to the British Museum an illuminated manuscript which the authorities endeavoured to purchase some years ago for 2,000l. It is a “Book of Hours,” illustrated with full-page miniatures by artists of the Milanese school between the years 1490 and 1520.

The Course of Lessons in modelling at the Royal Academy School of Architecture is terminated for the session, and a course of eight demonstrations will be given by Mr. Stannus, on Mondays and Thursdays at 6.15 P.M., commencing on Monday, the 17th inst., on “Sub-paneling and Ceiling-design.”

The Annual General Meeting of the London and Lancashire Fire Insurance Company will be held at 12 o'clock noon, on Thursday, April 27, at the Law Association Rooms, Cook Street, Liverpool.

The Architect.

THE WEEK.

DURING the preliminary stages of the Hull Trades Union case we advised the plaintiff not to be sanguine of success, for it is well known that the leaders of workmen have generally succeeded in wriggling out of the consequences of their acts. We could not have known that in Hull there was little astuteness displayed, and that the defendants were so presumptuous as to dictate who were to supply the materials that were to be used in the buildings on which the members of the trades unions were employed. It was not merely a case of ordering men to cease to work for an obnoxious employer. If the societies had been satisfied with calling out the workmen who were engaged on the buildings for which MYERS & TEMPERTON had obtained the contracts the courts could not interfere, but they insisted that it was penal to supply the firm with bricks, artificial stone, lime, &c., and because the plaintiff in the action declined to obey the unionist dictation and to leave his brother in the lurch, an effort was made to prevent all builders in the Hull district from dealing with him. The terrorism of the system is oppressive, and it was proved that people who had entered into contracts with the plaintiff preferred to accept the consequences of breaking them rather than come into collision with the Hull unionists. The fines that have been inflicted and the costs will, of course, come out of the funds of the societies, and therefore the defendants will not suffer the least inconvenience for their acts. Whether that is an equitable result is not evident to people who are outside the unions.

THE case WALLER v. HOLLAND and HANNEN, which came before the Queen's Bench Division on Monday, presents difficulties which reveal a necessity for an amendment of the Metropolitan Building Acts. The intention of the Legislature was, to express it shortly, to interpose obstacles to the spread of fire by means of vertical divisions, which undoubtedly was a prudent arrangement; but there is no doubt that fires can be localised by means of fireproof horizontal divisions, and consequently in such cases the necessity for the upright divisions or party-walls is minimised. The Act practically assumes that the interior of every building is constructed of inflammable materials, and sufficient allowance is not made for fireproof floors by which a building becomes a series of superimposed, independent structures, each being secure. In the case in question the building consists of eight storeys, each being separated by floors, or rather horizontal divisions of concrete and iron. The aggregate content is 289,000 cubic feet, and as the limit in the Building Act is 216,000 cubic feet, it was claimed by the district surveyor that there should be party-walls introduced in order that the prescribed normal capacity might be respected. It does not appear to be maintained that the building is insecure and needs vertical divisions to insure the public safety. The magistrate could only be guided by the letter of the law, according to which all floors are sources of danger; and he made an order that the 216,000 feet limit must be recognised. The builders appealed. Their counsel, while suggesting that it would be necessary to expend 20,000*l.* in order to comply with a rule that in this particular case brought no advantage, wisely stood upon the technical objections that the building was not a warehouse or manufactory (for the floors above will be utilised as refreshment-rooms for assistants, kitchens, &c.), and as part was not rebuilt it could not be designated a new building. The case was sent back to the magistrate for a restatement on the latter point. We dare not anticipate the result, although it is almost evident; but we consider that cases of the kind should not have to depend on technicalities. Construction has advanced since the time of the early building acts, but Parliament has not sufficiently recognised a fact that is so manifest.

WE understand that a good many people are disappointed on seeing the small works by MEISSONIER which are shown in the Haymarket. It is not to be expected that everybody can understand the value of the studies which

form so large a part of the collection. Many of them are exceedingly careful, and denote the existence of power that was as prompt as exact. Why the artist should guard them so jealously from all eyes is not evident; it must have arisen either from a foolish desire to appear mysterious, or from a mixture of craft and insanity like that exhibited by TURNER. The French painter possessed so little inventive power or thought it was absurd to imagine that he could heighten the interest of his miniatures by concealing his processes. Nobody questioned his skill, and nobody could be persuaded to value him for anything more than execution. He was never able to put forth powers that would be equal to a noble subject. INGRES would have rejected him as a disciple as scornfully as DELACROIX. MEISSONIER was not deficient in self-knowledge, and he was not to be tempted into a display of weakness. He could not paint women and children, so he rarely introduced one of either into his works. He could not go beyond his models, and as they were not able to appear as in action for a sufficient space of time to suit MEISSONIER's needs, he preferred to paint figures in repose, for which he could utilise them. There was no largeness about his ideas or his handling; a study two feet high was beyond his grasp. Accordingly he concentrated his attention on little things. People were accustomed to associate miniatures with weakness, and they were so much surprised to see that scale was not a bar to the display of some of the qualities of the painter's art that they imagined MEISSONIER to be a sort of MICHEL ANGELO, and that it was more difficult to treat the infinitely little with success than the Sistine frescoes. The true value of MEISSONIER may be assessed if we bear in mind that during his long and most prosperous career he was without any influence on French painting. Some of the extravagances of artists might be taken as a protest against his style. In England his works are not likely to afford many lessons, but they are worth attention as evidence of the success which a very shrewd man gains when he makes commercial principles guide his art.

At the annual meeting of the Manchester Society of Architects, the president (Mr. SALOMONS) in the chair, the following gentlemen were elected as officers and members of the Council for session 1893 and 1894:—President, Mr. EDWARD SALOMONS; vice-presidents, Mr. JOHN HOLDEN and Mr. W. A. ROYLE; hon. sec., Mr. PAUL OGDEN; assist. hon. sec., Mr. EDWARD HEWITT; members of Council, Messrs. A. H. DAVIES-COLLEY, T. CHADWICK, JOHN ELY, R. KNILL FREEMAN, F. MEE, J. D. MOULD, JAMES MURGATROYD, J. H. WOODHOUSE, T. WORTHINGTON (Fellows) and Messrs. P. HESKETH, J. S. HODGSON and H. E. STELFOX (Associates); auditors, Messrs. HENRY BRIDGFORD, P. E. BARKER; education in architecture committee, Messrs. A. H. DAVIES-COLLEY, T. CHADWICK, JOHN ELY, F. MEE, J. D. MOULD, J. H. WOODHOUSE (Fellows), and Messrs. P. E. BARKER, P. HESKETH, E. P. HINDE, J. S. HODGSON, H. E. STELFOX and P. S. WORTHINGTON (Associates).

THE Antwerp International Exhibition will be inaugurated on May 5, 1894, and will remain open for a period of at least six months, closing at the latest on November 12. This exhibition will include industrial, scientific and artistic productions, as well as all kinds of commercial produce—embracing, in fact, the whole range of human activity. The articles to be exhibited have been divided into sixty-six groups, which are subdivided into classes and sections. During the exhibition and in connection therewith the Antwerp Royal Society of Fine Arts will hold an exhibition of painting, sculpture, engraving and architecture, to which artists of all countries can contribute. The exhibition buildings will be located in the new quarter of the city near the river Scheldt and the new maritime installations; they will cover an area of about 75 acres and will be connected with the railway. The general plan provides for the erection of more than 100,000 square yards of covered galleries. In the section of building industry will be comprised building materials, upholstery and decoration, tools and utensils belonging to the building trades, furniture, toys and basket-work, heating and ventilation, lighting, &c.

THE WATER-COLOUR SOCIETY'S EXHIBITION.

WHEN it is said that the summer exhibition of the Royal Society of Painters in Water-Colours is, if taken as a whole, of average merit, it will be evident that many most interesting drawings are to be seen. It should not be forgotten that the members, although they have the undivided use of a gallery, work under some restrictions. The majority of them gained reputation before they were admitted into the Society. Their styles were, so to speak, fixed by public estimation, and in consequence departures out of certain tracks would be risky. Purchasers of drawings have their own notions, and in a great many cases they insist on what they consider to be characteristic examples of the artists. Experiments may be tolerated elsewhere, but in the Pall Mall Gallery, where traditions are supposed to prevail, it is expected that drawings can be identified without the aid of a catalogue. It would be impolitic on the part of the members and associates if they were indifferent to the ideas or prejudices of their patrons, and hence it is that few surprises await a visitor in any of the Society's exhibitions.

The President has two drawings derived from the beginning of "Gil Blas"—*The First Adventure of Gil Blas* and *Gil Blas taken Prisoner by the Robbers*. Sir JOHN GILBERT has been identified with scenes from CERVANTES rather than from LE SAGE; but as his Spain and Spaniards are in a measure of an ideal kind they are adaptable to more than one writer. The figures are old acquaintances, and it is satisfactory to see they continue to be as vigorous as of yore. The Deputy-President also appeals to our memory. If we have not met the two hale and hearty folks who appear in *Good-morrow, Gaffer!* in the street of a village, they are as familiar to our mental experience as is the *Pretty Cockatoo*—a class of biped that is decorous, and could never be addicted to swearing or loose language. Some day we hope Mr. MARKS will have the courage to represent a bird that stands in need of a lesson from a missionary; his specimens are becoming rather monotonous in their over-respectability, and of late there is a tendency to dullness among them. Mr. HERKOMER's peasants are of rather an oppressive type, and the *Hagar*, who has acquired some of the airs of a tragedy-queen, does not excite pity, although a castaway mother and child by the roadside hardly need auxiliaries to become affecting. If compared with M. CAZIN's recent version of the subject we can discover how much can be gained by simple treatment. Theatrical experiments are not improving Mr. HERKOMER's manner of representing ordinary life. In the portraits of Mr. BRITON RIVIERE and Mr. J. W. NORTH there is no opportunity for dramatic display, and they are as excellent portraits in water-colours as Sir F. W. BURTON used to paint many years ago. Mr. BULLEID's *Doris* appears to be a portrait and shows a painstaking effort to gain relief. Another work of the portrait type is Mr. CUTHBERT RIGBY's *In Wonderland*—a boy meditating and excellently modelled. But the artist's admirers will probably be more satisfied with the drawings from the Kendal district, which are most interesting, and one, *Kendal Fair, Saturday Night*, was almost too difficult to attempt. Mr. LIONEL SMYTHE's *Boulogne-sur-Mer* is called "an impression," but the figures of fisher-girls and sailors show a less emphatic expression of defects than is suggested by that word. The drawing has an out-of-doors character, although every visitor to Boulogne will not recognise the scene as common. Mr. RADFORD's *Nox Æstiva* may appear somewhat statuesque, but there is no denying the care that has been taken to ensure graceful contours, and the difficulty of gaining success with a figure of the kind is unquestionable. Mr. RADFORD's *Reflection* also merits commendation. Mr. HENSHALL is ambitious to make water-colours subserve difficult problems in figure-painting. His *Mary Magdalene* may be modern in type, but it is suggestive of a grief that is genuine. *La Coquette*, by Mr. HENSHALL, on the other hand, is true comedy, and it is not every artist who has the power to pass from grave to gay with so much dexterity. There is enough visible in the gallery to suggest how earnest are the endeavours of the younger members to overcome the limitations which used to be fixed for their art. When designing *Charity Miss Con-*

STANCE PHILLOTT was no doubt thinking of some of the old masters, but we find a grace and tenderness about the figures which, we fear, could only be expressed by a woman's hand.

Mr. POYNTER's drawing *In the Roman Baths at Bath* would delight Major DAVIS, who has done so much to reveal Roman greatness, for the endeavour to express the quality of the old ashlar is a tribute to architecture. While admitting the value of what is done, we are not disposed to recommend the exercise as beneficial, for, judging by the results in Mr. POYNTER's case, it seems to us that the imitation of old masonry tends to stiffness and heaviness in handling when dealing with animated subjects. Partly architectural is the *Street Scene in Suez* by Mr. HENRY WALLIS. This is one of the best of the artist's later drawings, and glows with colour. His mannerism, in which vestiges of Preraphaelite hardness is apparent, hardly suits some subjects, but as we may suppose the general shop in Suez is under a fierce light, the precision of the detail seems to give truth to the scene. Eastern scenes in the gallery must always compel one to ask what has been done by Mr. CARL HAAG, who has made that class of work popular. His single drawing, *A Jerusalem Askenaz at Devotion*, is one of those characteristic figures which could only be produced by an artist whose acquaintance with the East was thorough and affectionate. Mr. R. W. ALLAN, who is fond of experiments in colour, and has not as yet made any province his own, has supplied some Eastern scenes which are more "blottesque" than is requisite. We prefer such northern scenes as *Crossing the Ford*, in which he expresses more than is possible to be done from brief visits to a place. Somewhat akin is Mr. A. MELVILLE, whose *Court of Lions* and *The Nile at Boulaek* have a claim to be taken as examples of Impressionism.

Mr. ALBERT GOODWIN is one of the few members whose experiments are tolerated. It may be that the public are more fascinated by his visionary scenes than by the views that are taken above the housetops of quiet English towns. This year he contributes an example of the former that was inspired by DANTE, and there are also views of Salisbury and Bridgnorth. Mr. THORNE WAITE wisely keeps to quiet country scenes under a subdued light, which have for so long found favour with the public; but in his *Evening Glow* he reveals a power that could be more often exerted with advantage. Mr. W. COLLINGWOOD was never more effective than this year in his mountain scenes, which are mainly Alpine subjects. Compared with so much majesty, the London views of Mr. MARSHALL, Mr. HODSON and Mr. GOODALL, with all their excellence, appear unpretending, and it is fortunate for all who represent buildings that most of the landscapists prefer lowland scenes. Mr. A. W. HUNT, in his *South Country Manor House*, takes care to allow only a glimpse of roofs, windows and chimneys to be seen amidst the trees; and Mr. BIRKET FOSTER, like Mrs. ALLINGHAM, embowers his cottage in vegetation. Mr. R. BEAVIS this year again displays his versatility. In a business sense it would be wiser if he kept himself to such scenes as *Crossing the Sands*, where his skill as a landscapist and animal painter can be combined in the production of a kind of drawing such as no other artist could produce so effectively.

BRIDGE CONSTRUCTION.*

ALTHOUGH books on construction are not sought after with eagerness in this country, yet in about five years the first edition of Professor CLAXTON FIDLER's work on bridge construction has been exhausted. So much success may be considered as somewhat exceptional, and arises from the combination of experience and simplicity of treatment which is displayed in every page. Engineering is not a subject which can be allowed to stand still for five years; there have been changes in bridge construction since the first appearance of the volume, but, as the author says, "these changes, however, do not appear to demand any considerable alteration in the methods of treatment that have been adopted in the work, nor in the numerical calculations

* *A Practical Treatise on Bridge Construction*. By T. Claxton Fidler, M.Inst.C.E., Professor of Engineering, University College, Dundee. Second edition. Charles Griffin & Co., Limited.

that it contains." But some extended applications of theory appear in the pages.

One relates to the important subject of the deflection of bridges under the passage of a train. The subject was investigated by a Royal Commission in the early days of iron bridge construction. In America bridges varying from 128 to 150 feet in span have been tested by Mr. A. S. ROBINSON for the Railway Commissioners of Ohio. The deflection was ascertained carefully for a rolling load. The "static deflection" under a load at rest was not observed; probably with stiff girders it would not be apparent, but it was assumed to be a mean between the two extremes of the rapid secondary vibrations which the girder generally exhibited. The effect of moving loads was as follows:—

It was found that during the passage of the engine the elastic vibrations had an extreme amplitude varying from '28 to '57 of the static deflection, so that the normal deflection was increased by a fraction varying from '14 to '285. When the bridge was being traversed by a long train of goods waggons, the elastic vibrations sometimes had an amplitude equal to the whole "static deflection," so that the normal deflection was increased by 50 per cent.; and notwithstanding the comparative lightness of the load per foot, the extreme deflection (including vibration) was sometimes as great as the highest value observed during the passage of the heavy engine. The great vibrations which were observed during the passage of the goods waggons is attributed to the coincidence between the spacing of the wheels and the spacing of the cross girders; and to the fact that with a certain speed of train, the reiterated incidence of the wheels upon the cross girders has a time-period coinciding with the natural period of vibration of the elastic bridge—so that the effect set up is comparable to the effect of the measured march of infantry, the impulses being due to the elastic spring of the intermediate stringers and perhaps also of the cross girders.

The American experiments are preferable to the English, for in the latter simple beams were subjected to tests, while the Americans took a bridge, which was a complicated piece of construction, and therefore liable to a variety of stresses, which all parts should be competent to sustain. In England it is common to assume a certain uniformity in the loading—say, one ton per foot run; but the Americans and the French prefer to assume concentrated loads on certain points, and to calculate the results of the strain of the arbitrary axle-loads on the various members of the bridge. Professor FIDLER shortly describes this arrangement when he says:—"In America it has for some time been the rule to calculate the required strength of railway bridges, taking as a standard load a certain type of engine and a certain type of car specified by the railway company or by the bridge building firm; while a similar plan has latterly been followed by the French Government, who have fixed the standard load as consisting of a train of goods' engines, weighing $15\frac{3}{4}$ tons each, and headed by two tender-engines, each engine weighing $55\frac{1}{2}$ tons, with a tender of $23\frac{5}{8}$ tons." Professor FIDLER explains how the test can be applied graphically by a comparatively simple process. The Board of Trade requirements do not err in laxity, and a good many French and American bridges would not be passed if the English standard were applied to them; but as civil engineers have to travel and work in many lands, it is an advantage to be familiar with the requirements of foreigners and competent to meet them.

Another subject that is allied to the foregoing is the provision to be made for wind pressure on railway bridges. In the majority of English bridges that was a factor which was not considered when the dimensions were worked out. Yet no casualties arose from the neglect. The Tay Bridge, which was the scene of the most melancholy of all accidents on iron structures, did not succumb to the Christmas storm, although if it were overturned by a breeze nobody who was acquainted with the structure would be amazed. A committee afterwards recommended that provision should be made for a pressure of 56 lbs. per square foot, as well as provision for the contingency of the overturning of the bridge, but the wisdom of the rules was not generally recognised. The Americans ostensibly are very careful in recognising the possibility of extraordinary storms operating with full force on a bridge, but the Professor is compelled to admit that "if we compare these pressures, taken over the area of a single girder only, with the actual section of the wind braces in many American bridges, we shall find that the resulting stress would be very high indeed, and would sometimes approach if it did not exceed the elastic limit."

The Americans undoubtedly excel us in the variety of

their girders. Long ago Mr. R. H. Bow devised a great number of ingenious arrangements of braced girders; but however much they were admired by pupils and assistants who kept up their knowledge of theory, they were not turned to much account in drawing-offices. The simplicity of which STEPHENSON and FAIRBAIRN approved still exerts an influence on English practice, although the great feat of spanning the Firth of Forth with cantilevers may cause a revolution in the way of dealing with simpler cases. Professor FIDLER contrasts the English and American ideas with accuracy in the following paragraph:—

In the foregoing survey and classification of bridge structures, it will be observed that we have completed a sort of circular tour, beginning and ending with the parallel girder. In the first instance the girder was considered as a simple structure or beam, carrying the whole uniform load by its resistance to transverse bending; but in the present chapter it has been regarded as a composite structure or truss. These two aspects represent the ideas which form the basis of English and American practice respectively. In England the simple beam was refined into a plate girder, and the plate web was improved by the substitution of diagonal bracing. But in America bridge construction was at first very largely carried out in timber or in combinations of timber and wrought-iron; and these materials were framed together in various forms of truss from which the wrought-iron trusses of the Linville, Whipple and other types have been developed. The forms of lattice-girder which have been reached by these two opposite lines of progress are identical in principle; but the same difference of fundamental ideas still marks the character of girder construction as carried out in the two countries. In American girders (or trusses as they are called) each member is treated as having a separate and simple function to perform; but in England, although the subdivision of function is allowed in theory, yet in practice all the members are riveted up together so as to make the girder as far as possible a rigid whole, resembling in some degree the solid beam from which it is derived.

All that we said in praise of the first edition of Professor CLAXTON FIDLER'S book when it appeared is confirmed by a perusal of the second edition. It is a model of a treatise on a constructional subject, theory being kept in subordination to practice. The author is not vain of his knowledge of mathematics, and he does not forget that his pages will be studied by men who read because they have to design. His book is therefore as useful to girder-makers as to students of bridge construction.

PETERBOROUGH CATHEDRAL.

A LECTURE was recently delivered in Peterborough by the Bishop. His lordship, according to the *Northampton Mercury*, said the subject of his address that evening was probably an exceedingly dull one. Not dull in itself, but only dull because they would find him a dull expositor on a subject which deserved a more adequate treatment than he could give it. He supposed they all had some pleasure in the place in which they lived, and he was bound to say for himself that he had rather an insatiable curiosity. He always wanted to find out as much as he could about anything he saw. Living under the cathedral at Peterborough he had seen a great deal of it, and he began to ask himself the question, "How did it come to be what it is?" One subject was just as good to learn about as another, and he never thought that one subject had more in it than another. Knowledge was very much like trade. A lady who was very anxious that her son should be successful in life asked one of the Rothschilds for advice as to what line her boy should take up. Rothschild said, "Selling matches in the streets. There is no better line than that, provided you sell plenty of them." It was the same with any branch of knowledge. Provided they knew plenty about it, it was always interesting. Nothing was interesting if they only knew a little about it. He would tell them as much about the cathedral of Peterborough as he had been able to find out, how it came to be what it is, and he might at least show them something of the activity of the England of the past, and of the qualities which had gone to make the England of the present, because the England of the present was after all but the product of the men who had laboured in the days of the past. It was always worth our while to remark that if we were to make the England of the present better, and hand it on in a better condition to those who were to come after us, it must be because we in our day and generation tried to imitate those qualities which our forefathers possessed, and the qualities to which we ought to be able to give greater effect because of the increased appliances which modern knowledge and science had put within our grasp. The dominant feature in the history of Peterborough was the fact that it was built on the verge of the Fen lands. The characteristic of this Fen land was not so much that it was covered with the sea water as that the drainage water from the main land ran down, and not being able to get in the sea, formed a

swamp. For nine months in the year it was a swamp, but in the summer it grew some coarse grass. The Fen contained numerous islands, upon which the towns were situated, the people maintaining themselves by fishing. In ancient times Peterborough was in the kingdom of Mercia, which was almost the last to receive Christianity. Penda, the king, was an irreclaimable heathen, but his son fell in love with the daughter of Oswin of Northumbria, and embraced the new faith, being baptized in 653. Penda was slain in a battle in 656, and Peada, his son, founded a monastery at Medeshampsted, the site of the present Peterborough. The work of the monks in those days consisted largely in colonising the surrounding districts, and the Fen country was a favourite spot for monastic institutions. The monasteries civilised the Fen district, and governed it in a sort of a way, but their work was destroyed in 870 by a Danish invasion. The Danes burnt the monastery of Medeshampsted, and slew the eighty-four monks. The Abbot of Crowland Abbey, founded by Guthlac, buried the bodies of the monks, and afterwards added a sepulchral monument, the stone of which was now preserved at Peterborough Cathedral. In 966 a monastic revival took place under Edgar and Dunstan. It was not entirely a sacerdotal revival. There had grown up a habit of reading into history a constant war of sacerdotalism against the civil forces of the country. This was quite unhistorical. The ecclesiastics were the only people of any education who were not engaged in fighting, and thus they were of necessity the officers of society for pacific purposes. Afterwards, as more of the laymen became educated and able to take up these duties, the ecclesiastics were gradually deprived of them, and he feared very much that they grumbled at the process. Dunstan's revival was for the better government of the outlying districts, and to reclaim the country from the Danes; and, as a matter of policy, he and Edgar worked for the restoration of the old monasteries. In 966 the second cathedral of Medeshampsted was built, and, for the purposes of protection, surrounded by a wall. The old name was lost, and the place was merely called Burgh. The monastery being dedicated to St. Peter, in later years it gained the name of Peterborough. Very little was known about that church. Hereward the Wake entered into an alliance with the Danes and invaded it in 1069, and burnt the monks' buildings and drove out the monks. The church was spared then, but in 1116 the whole of it was burnt. He was afraid this time that the disaster came upon it owing to an outburst of bad temper, and it was a very moral story. The story was that the Abbot de Seez, getting up one morning "in a bad way with himself," rated his cook because his breakfast was not prepared. The servant in the bakehouse, in his anger called out, "Come, devil, and blow the fire." The invitation was responded to, and the fire was blown to such purpose that the building was set on fire, and the flames spreading destroyed the church. It was decided to begin to rebuild, and he had to tell them the history of the way the church was rebuilt. The means of discovery were by such records as they possessed by monastic chronicles, and it was very strange how little they told them of the place in which they lived. A careful study of the architecture itself revealed to them, if they pursued it intelligently, the periods at which the building must have been stopped and the periods at which it was resumed, and they could make any building tell its own story. Northamptonshire owed its great name to its churches. They were famous all the world over, and they were famous for these two reasons. First of all, because of the splendid stone of Barnack, and secondly, because the water carriage could bring it everywhere where it was wanted. Builders of past time never built for population. The size of the congregation had not the least place in the architect's mind when he prepared the plan. That only occurred nowadays, when we had more people than we knew what to do with. The people in those days, too, stood and not sat in the churches. The very next year after the destruction of the building by fire John de Seez undertook the rebuilding, the choir being put up between 1117 and 1140. The question had arisen whether the present building contained any remains of the older one it succeeded. That had now been set at rest, because in the course of recent work at the cathedral the site of the old building had been discovered. The architectural magnificence of Peterborough Cathedral depended entirely on the existence of the great quarry of freestone at Barnack. From 1155 to 1175 Abbot William of Waterville built the transepts and the central tower. The last named consisted then of three storeys, if not four. From 1175 to 1184 Abbot Benedict built the nave. He originally intended to finish the nave at the third bay, but probably a visit to Lincoln Cathedral showed him the beauty of the western transept, and he added another bay, so that such a transept might be built at Peterborough without interfering with the monastic buildings. A further bay was built, and it became a burning question how to finish the cathedral. The changes of design which took place, and which were illustrated in the building, formed one of the most interesting processes in connection with any building he had examined. His lordship, by

means of a photograph of a couple of bays in the choir, showed and remarked on the quiet and dignified style of the original Norman architecture. The building of the cathedral extended over a period of years in which the architectural style of the country changed considerably; but the builders of Peterborough adhered to the old style till they reached the front, with the result that, as they got farther to the west, their style got more and more clumsy, because they were not working freely in accordance with the conceptions of the time. Time proved that the pillars of the centre tower were not strong enough to bear the tower's weight, a defect almost always found in Early English architecture. Had the builders gone down another 18 inches they would have reached the rock, but they had reasons of their own for placing the foundations upon the earth. The result was that the tower had to be lowered, and was now a squat structure not in proportion with the length of the cathedral. A most interesting and lucid account of the history of the west front was next given by his lordship, who remarked that when that was reached the builders did not feel there was any need to restrict themselves to the Norman style, but allowed themselves to proceed with their work in Early English. The west front became the chief object, and the original design was modified considerably from time to time. The front presented really a great stone verandah connecting the two flanking towers. They were told that the west front of Peterborough Cathedral was the most magnificent piece of architecture in England, but he was bound to say that he did not think so. When they saw a front consisting of three huge arches, they naturally asked what those arches were meant to contain. The design appeared to have been for them to have contained three miserable little doorways, for the early English architects were sadly deficient in the matter of doorways and doors. To have arches which ought to be doors, and to have such doors underneath them, was not a thing to be mentioned as the noble achievement of a sane and sober architect. Pointing out upon the photograph the incongruities which resulted from the frequent change of design, his lordship especially dwelt upon the lovely work of the pediments at the top of the archways. Sometimes they talked as if everyone who lived in the present day was stupid, and as if everything that was done in the old days was wise, but they saw that people in the old days, though they might make beautiful things, yet occasionally did not exhibit beauty and wisdom hand in hand. In many old buildings they saw clearly that the architect began in an exceedingly rash way, and allowed the design to grow as it would under his own hands. Very often he did not know when he began or where he was going to finish, and that was the case with the architect of the Peterborough Cathedral. There was, curiously, no record of the building of the west front, but it must have been between the years 1200 and 1230. The cathedral was consecrated in 1237, and in 1260 Richard, of London, gave a peal of bells called "Les Londres." It was then found that there was nowhere to put them. A tower was therefore built on one side of the cathedral, and then it was discovered that this lent a somewhat lop-sided appearance to the structure. The old builders were not such slaves to uniformity as modern people, so that to balance the bell tower, instead of erecting a second tower on the other side, they added a lovely spire to the flanking tower most remote from the bell tower by way of a counterpoise. Then the second flanking tower was felt to need a similar treatment, and a spire was added to that, though quite dissimilar to the first. Having explained the reason for the span of the two side arches being greater than the middle span, his lordship spoke of the small porch which was added in 1370. It entirely ruined the appearance of the three archways, but its object was to act as buttress to the two centre pillars which were found to be leaning. Of itself the porch was a beautiful bit of work in the Perpendicular style. His lordship next referred to the subsequent alterations, especially mentioning the reconstruction of the windows from the old Norman style to allow for the introduction of more glass. The rich tracery of this later work was illustrated, and the history of the eastern chapel, added round the old apse, and its stained windows, was given. The different styles of the doorways were also shown, in addition to several views of different parts of the interior of the cathedral. His lordship, in concluding, said he loved architecture above all other arts, and he thought the great reason why he loved it was because it was of all other arts the most popular art, it was absolutely the most democratic art, and it appealed to everyone, it could be seen by everyone, and it was the possession of everybody alike. Architecture they could see in the streets as they passed by, and they should try to learn to love it and see in it the beautiful things that came from the minds of those of former times, the conceptions they left behind them, which told them of their aspirations, their endeavours and their longings. Look at St. Peter's Church, Northampton. If they passed such a building as that, and caught the beauty of its mouldings and the delicacy of its tracery they might feel as though there came a voice to them from the past that told them to be of good

cheer, a voice that told them they were the inheritors of traditions, and a voice that bid them also to see that in their hands those traditions suffered nothing, but were handed on to those who came after them enhanced in value.

THE BATEMAN HEIRLOOMS.

THE important collection of works of art and antiquities known as the Bateman heirlooms have been sold. The most important lots were as follows:—Enamels.—A chalice-shaped cup of Venetian enamel of the sixteenth century, 61*l*. (Money); an important triptych of Limoges enamel representing the Adoration with St. Michael and St. Catherine in the two wings, 156*l*. (Rollin); an alto-relievo in Oriental alabaster of German work, circa 1550, from Lord Shrewsbury's collection, 122*l*. Ivories.—An important ivory diptych of the sixth and seventh century, described by the late Mr. Bateman "as matchless in this as specimens of the period," 182*l*.; an ivory carving of Italian work of the fourteenth, representing the Coronation of the Blessed Virgin, in fine condition, 70*l*.; leaf of a diptych of the fourteenth century, representing the Coronation of the B.V. and the Nativity, 70*l*.; a valuable diptych, or probably covers of the Gospels, formed of two large plaques of ivory, in three compartments, representing incidents of the life of the Saviour, the whole within an acanthus leaf border. This fine example of early Christian art, originally from the cathedral of Trèves, formed a portion of the collection of Samuel Rogers. The ivory carvings are assigned to the eighth and the metal to the thirteenth century. There was much competition for this, and eventually it was secured for 1,000*l*. It sold for something less than 400*l*. in the Roger's sale. Metal work.—The head of a pastoral staff, twelfth century, in bronze gilt, of simple volute form, 50*l*.; a gorget of the seventeenth century, in copper, richly gilt, of bold repoussé work, elaborately chased, with a battle scene, from Lord Shrewsbury's collection, 63*l*.; a bronze ewer of German work, 52*l*.; a curious equestrian bronze figure of a knight, thirteenth century, 61*l*.; a fine silver mace, given by Charles I. to the Corporation of Leicester, 58*l*. (Usher); a horn book of the seventeenth century, with portrait of Charles I. on reverse, 65*l*. The heirlooms realised 3,133*l*.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the meeting of this Association in the Royal Institution, Mr. W. W. Robertson, H.M. Board of Works, president, in the chair, Mr. A. H. Millar, F.S.A. Scot., read a paper on "The Old Howff of Dundee," on many of the monuments and their inscriptions in which burying-ground he commented and illustrated by means of the limelight. He traced the origin of the cemetery, pointing out that the orchard of the Franciscan monastery had been granted by Queen Mary for that purpose in 1567, and that for three hundred years afterwards the "Howff" (which had been so named from the fact that up to 1778 it was used by the crafts as their meeting-place) continued to be the chief place of interment in the town. Consequently the sacred spot was peculiarly rich in memorial-stones, indicating the alterations that had from time to time taken place in the artistic tastes of the community, and Mr. Millar gave it as his opinion that no other Scottish burial-place contained so many sculptured memorial bearings of extinct Scottish families. At the close of the lecture—in connection with which about one hundred lantern slides were used—the President of the Association and the Lyon King of Arms (Mr. Balfour Paul) and others testified to the excellence of what had been brought before the Society, the last-named gentleman alluding to the interest which attached to many of the ancient gravestones of the "Howff," particularly from a heraldic point of view. Subsequently Mr. Millar received the cordial thanks of the Association.

FORESTRY IN AMERICA.

THE *Engineering News*, New York, says:—The importance of the systematic tests and investigations of the timber and timber supplies of the United States, which have been instituted and commenced by the Forestry Division of the United States Department of Agriculture, has been pointed out several times in the columns of this paper. It has been shown that this is a work which deserves the aid of the Government, being in the public interest; but we learn that although many leading railway engineers, architects, professors of engineering and others interested in the timber tests have written letters expressing this view to their representatives and senators and to the committee on manufacturing, in whose hands the special appropriation for the work was pigeon-holed, neither the committee nor the House paid any attention to this expression of public interest. The Senate, however, realised that there was value in the work and sincerity in its endorers, and increased the appropriations for the Forestry Division by 8,000 dols., and

that is 20 per cent. of the amount asked and considered,* by those in charge as necessary to continue the work on a proper business basis. Under these circumstances the testing will be discontinued until after July, when the new appropriations will become available, and then proceed at the slow pace which Congress has set. While the result of the efforts of those who took active interest in securing appropriations for the work were not crowned with that success which they deserved, this is the only proper method of influencing legislation, and those interested in the investigation should not fail to move again when the new Congress assembles.

The first compilation of test results is now in the hands of the printer, and will probably be issued in a few weeks as Bulletin No. 3, Timber Physics, Part II. It will contain the results obtained on longleaf pine, and will especially discuss in detail the results of tests and examinations of bled and unbled timber, results which in themselves justify the expenditure by the Government of money on such work. Part I. was issued several months ago. At the World's Columbian Exposition the Forestry Division will exhibit the methods pursued in this work, which will be of interest, since nowhere in the world has such comprehensive and systematic investigation of timbers been ever devised. The working plans for a similar undertaking by the Prussian Government have only just been perfected. Another exhibit of interest to railway engineers and those interested in reducing forest waste will be a collection of the most approved types of metal railway ties used throughout the world, and a complete set of coloured drawings illustrating the various forms of metal ties now in use, being copies of the original drawings from which the plates were made for the report on "The Use of Metal Railway Ties," made to the United States Government by Mr. E. E. Russell Tratman in 1890. This report showed that, excluding the United States and Canada, which have no extent of metal track, over 13 per cent. of the railway mileage of the world is laid with metal track. The exhibit will also include metal tie-plates, which are an important addition to railway track equipment.

TESSERÆ.

Mosaic Floors.

MOSAIC floors have been in use from a very early period. The most ancient on record is the floor in the palace of King Ahasuerus at Shushan, described in the 1st chapter of the Book of Esther as "a pavement of red, and blue, and white, and black marble." These were the prevailing colours also in the Greek and Roman pavements. They were generally formed of small cubes, some of them very minute, arranged in various interlaced and flowing patterns, principally geometrical, with animals and other figures interspersed. Pliny says, "The most celebrated Greek mosaic worker was Sosus, who strewed at Pergamus what they call 'the unswept room' (*Asaroton Aicon*), because he had represented all the leavings of a repast in various colours on the floor." The numerous Roman pavements discovered in different parts of this country are composed of tesserae not exceeding an inch cube, and the principal colours were red, black and white. Ormerod, in describing the Roman bath discovered in Watergate Street, Chester, in January 1779, mentions "an adjoining large chamber with a tessellated pavement of black, white and red tiles, about an inch square." Sir Robert Atkyns, in his work on the present state of Gloucestershire, p. 350, says:—"There was accidentally discovered, in a meadow near the town of Cirencester, an ancient building underground. It was 50 feet long, 40 feet broad, and 4 feet high, supported by 100 brick pillars, inlaid very curiously with tesseraic work, with stones of divers colours, little bigger than dice." The fragments of Roman bricks which are so frequently found in Chester are also commonly called tiles, but they are quite distinct from floor tiles, being usually about a foot and a half long, a foot wide, and one and a half inch thick, of unglazed red clay. These were formerly called wall tiles, and from this term they received the name Roman tiles, but they were principally used as bricks in constructing walls, and some of them as roofing and water tiles. Earthenware of this description, because they were called tiles, seem to have conveyed an idea to some minds that all tiles discovered below the ground are Roman. Tiles were, however, much used for floors in the Middle Ages also; but these are easily distinguished from the Roman pavements, as the tesserae of the latter scarcely ever exceeded an inch cube, whereas the Middle Age tiles vary from 4 to 6 inches square; moreover, the Roman tesserae were each of a self colour, the pattern being formed by combining a number of them so as to compose a picture, just as the coloured stitches in woolwork are arranged in the present day, whereas the pattern on a Mediæval floor is inlaid in the tile itself. Ornamental tiles of this kind were much used for paving the floors of churches and religious houses, so that, being generally confined to buildings of a sacred character, wherever they are found, there is good reason to suppose that a religious edifice had at one time occupied the

site. There are few samples, however, of an earlier date than about the middle of the thirteenth century. The earliest are of red clay, stamped with a pattern, and the sinking filled up with white clay, and glazed. Such tiles are frequently ornamented with foliage in various colours and forms, according to the different periods in which they were made.

English Patronage of Painting.

We have private patronage in England to an extent which no other nation possesses. Let us encourage this market by supplying it with excellence rather than choking it with abundance: husband it in every way; let not its importance be underrated. To this class of patrons we owe the chief works of art in our land. The whole range of landscape-painting, scenes of familiar life, all our portraiture and a great proportion of our historical works are the offspring of individual encouragement. The palaces of Rome, of Florence, of Bologna and of Venice were filled with works from the like source. It was by this, and this alone, that the great families of the Doria, the Colonna and the Altieri acquired their magnificent specimens of Claude Lorraine and of the Poussins: it was by this that the Farnese, the Farnesina, the Rospigliosi and the Ludovisi were decorated; by this the family of Orleans became possessed of the Sacraments of Poussin; and by this has the Burgomaster Six been handed down to our day as the friend and benefactor of Rembrandt. All who desire to distinguish themselves and grow into eminence in art; all who begin to plume, as it were, their wings for an untried flight in the higher or the humbler regions of art, must hope for success through patronage such as this—a patronage which surpasses far that of many foreign governments, and has been established here both by patriotism and generosity. To this source all that the genius of our school has produced must stand indebted for origin and support. This is a feature in our art, as well as a proof of the increasing taste and growing wealth of the empire. Activity of mind in the artist, a variety and diversity of subject, an originality of style, splendour in colour, a happy adaptation of the theme to the feeling of every variety of being: an observance of these ruling points has enabled English art to penetrate and become an object of demand in every country in the world.

The "Erber," Thames Street.

On the south side of Thames Street, between the Steel Yard and Dowgate, stood that magnificent mansion of the olden time, the "Erber," so intimately associated with the stirring times of chivalry, and with more than one illustrious name. It was granted by Edward III. to the gallant and learned Sir Geoffrey Le Scrope. Its next illustrious occupant was John Lord Neville of Raby, the heroic companion in arms of Edward III., from whom it descended to his son, Ralph Neville, first Earl of Westmoreland. This was that powerful lord who was so instrumental in raising Henry Duke of Lancaster to the throne as Henry IV., and who afterwards so distinguished himself in that Border warfare and in those successful operations against the Percys which led to the battle of Shrewsbury and to the untimely end of the impetuous and heroic Harry Hotspur. From the Earl of Westmoreland the "Erber" passed into the possession of another branch of the Nevilles, the Earls of Salisbury and Warwick. But the principal interest which attaches itself to the spot is from its having been the residence of the great "King-maker," Richard, Earl of Warwick. Some idea may be formed of his princely hospitality from the fact that at his house in London no fewer than six oxen were daily consumed by his retainers at breakfast, any person, moreover, who happened to have access to his establishment being permitted to take away with him "as much sodden and roast meat as he might carry upon a long dagger." After the death of the Earl the ragged staff and white cross disappeared from over the portals of the "Erber," and not long afterwards we find it occupied by the ill-fated George Duke of Clarence, "false, fleeting, perjured Clarence," who obtained a grant of it from Parliament in right of his wife, Isabel, daughter of the "King-maker." After the death of Clarence the "Erber" became the residence of his younger brother, Richard Duke of Gloucester, on whose usurpation as Richard III. we find it styled the King's Palace, and undergoing considerable repairs. During the brief reign of Richard it was occupied for him by one Ralph Darnel, a yeoman of the crown, but on the death of the usurper was restored to Edward, son of the Duke of Clarence, in whose possession it remained till his attainder in August 1500. It was rebuilt in 1584 by Sir Thomas Pullison, Lord Mayor of London, and not long afterwards became, according to Stow, the residence of the great navigator and hero Sir Francis Drake.

The Engraving of "The Death of Lord Chatham."

"The Death of Lord Chatham," by Bartolozzi, is too well known to need description. Although a work of great ability and immense labour, it has never become a standard, or at all a popular print. It was many years in hand, and the price agreed upon with Copley (2,000 guineas) was nearly expended

by Bartolozzi on assistance, which proved for the most part, according to his account, worse than none. Testolini, a fellow-countryman, was employed on it for three or four years, and to his entire satisfaction, as expressed by his principal during its progress; but their engagement terminated in a quarrel, and Bartolozzi erased much of what Testolini had done. Delattre, the ordinary and regular assistant of Bartolozzi, also contributed his aid, and was afterwards commissioned by Copley to make a smaller engraving, a copy of the larger, for which he engaged to pay him five or six hundred guineas, but afterwards refused to receive the plate on the plea of gross imperfection in its execution. This led ultimately (1801) to a lawsuit, which excited great interest in the little world of art, and ended in favour of Delattre, to whom the jury gave a verdict for the whole amount of his claim. The plate, however, though paid for, was never published. The motive which influenced Copley in having a smaller engraving made was with the view of preventing surreptitious copies being circulated to the detriment of the larger one, from the successful sale of which he expected extraordinary results, in which he must have been greatly disappointed.

Chantrey and the Nelson Column.

Chantrey was always consulted by the heads of the government on the propriety of public testimonials. Among others he was desired to send his opinion as to the propriety of erecting a column, with a statue on the top, to the memory of Lord Nelson. He seriously and reasonably objected to a column, for a column ought to be part of a building, or if it be used as a monument, it should be treated as a biographical volume, with the acts of the hero sculptured on the shaft of the pillar on the capital of which he stands, similar to those of Trajan and Antoninus. Chantrey also wished to see the useful united with the commemorative, and would have preferred an architectural edifice, adapted to accommodate (with dwellings rent-free) the veteran officers of the navy, and the site adorned by a fine statue of Nelson, forming altogether a memorial worthy of the hero and indicative of the gratitude, generosity and benevolence of the nation.

Roman Glass.

Thick sheets of glass of various colours appear to have been laid down for paving floors, and to have been attached as a lining to the walls and ceilings of apartments in dwelling-houses, just as scagliola is frequently employed in Italy and occasionally in our own country also. Rooms fitted up in this way were called *vitrea camera*, and the panels *vitrea quadratura*. Such was the kind of decoration introduced by Scaurus for the scene of his theatre, not columns nor pillars of glass as some, nor bas-reliefs as others, have imagined. The question whether glass windows were known to the ancients has, after much discussion, been set at rest by the excavations at Pompeii, for not only have many fragments of flat glass been disinterred from time to time, but in the tepidarium of the public baths a bronze lattice came to light with some of the panes still inserted in the frame, so as to determine at once not only their existence but the mode in which they were secured and arranged. From the time that pure glass became known, it must have been remarked that when darkened upon one side, it possessed the property of reflecting images. We are certain that an attempt was made by the Sidonians to make looking-glasses, and equally certain that it must have failed, for the use of metallic mirrors, which are more costly in the first instance, which require constant care and attain but imperfectly the end desired, was universal under the empire. A strange story with regard to an alleged invention of malleable glass is found in Petronius, is told still more circumstantially by Dion Cassius, and is alluded to by Pliny, with an expression of doubt, however, as to its truth. An artist appeared before Tiberius with a cup of glass. This he dashed violently upon the ground. When taken up it was neither broken nor cracked, but dented like a piece of metal. The man then produced a mallet and hammered it back into its original shape. The emperor inquired whether anyone was acquainted with the secret, and was answered in the negative, upon which the order was given that he should instantly be beheaded lest the precious metals might lose their value should such a composition become generally known.

The Process of Etching.

Etching, as a process for the ornamentation of metal surfaces, was practised as early as the middle of the fourteenth century. As to who first employed it for the purpose of taking impressions authorities are in doubt, but to Albrecht Dürer, of Nürnberg, we owe the first important works, not commensurate, however, in success with the results obtained by him with the graver. Of his pieces, of which he etched some nine, the *Virgin and Child* and a *St. Jerome*, dated 1512, are considered the most satisfactory. The practice may be described shortly as follows:—A cleaned plate of polished copper is covered with a varnish protecting layer called "etching ground." To this the design is either transferred or drawn at once, or worked

out on the ground with the aid of the etching-point or needle. This point—a stout piece of steel wire, varying in thickness inserted in a handle—removes the ground from the metal plate wherever it works or passes, thus exposing the plate to the action of an acid when poured over it, as it actually is in the next stage of the process. A low wall of wax having been built up along the margin of the plate, dilute nitrous acid is poured over the latter. This stage is called “biting in.” The acid coming into immediate contact with the copper, where the etching-needle has scraped away the ground as it traced out the design, eats away or corrodes out the metal more or less deeply the stronger the acid and the longer time it is allowed to remain. Where the ground has not been removed by the needle the acid cannot act upon the plate. Thus, where it has been taken away the design remains bitten into the copper, and visible as soon as the remains of the acid and etching-ground are cleared off. The plate is then inked, and an impression or proof obtained as from other engraved objects. In addition to the action of the acid, the dry point—so termed from no acid following its use—is brought into requisition, producing more or less of what is known as “burr.” This burr, during the process of printing, gives off rich velvety gradations to the impression. The burr is, in fact, the ridge of the copper material thrown up by the dry point on the left edge of the furrow, as the instrument cuts its way through the metal, which, catching and retaining the ink in a peculiar manner, protects a certain margin of smooth copper against the operation of the printer’s hands when wiping the plate. The ink remains on this smooth copper, but passes away from the burr with a delicate gradation, giving a peculiar softness to the line.

Polychromy of Greek Temples.

The discovery of Greek temples coloured on the exterior is doubtless a very remarkable fact in archæology, for if these monuments appeared to many persons to reject the application of colours in their external decoration they were assuredly made by the Greeks. Now, it is impossible not to admit that it was among these people that the alliance of colours with architecture was made, not at the epoch of its decline, but at a period when they erected monuments in the best style; in fact, the ruins of coloured temples discovered by the excavations made in Greece, Italy and Sicily, in places where many Greek colonies prospered, have this characteristic in an unmistakable degree. If we seek the cause which has determined the Greek architect to seize upon one of the most powerful means that the painter has of addressing the eye, we shall find it especially in a taste for colours rather than in the intention of rendering the various parts of an edifice more distinct from each other by colouring them differently and of substituting painted ornaments for ornaments in relief, whether sculptured or moulded, or of augmenting the relief these ornaments already possessed; finally, the communication of the Greeks with the Egyptians may have induced them to imitate the latter in this application of colours to monuments. In the coloured drawings of Greek monuments we may remark not only the number of colours employed in these monuments—white, black, red, yellow, green and blue—but also the use which has been made of them under the relation of variety and purity of tint, of distinct view of the parts, and of the harmony of the whole. In the work of the Duke de Serra di Falco upon the “Antiquities of Selinonte,” we see coloured designs representing the ruins of Greek temples, where the principal lines, such as the fillets of the architrave and those of the cornice are red, the mutules blue and their guttæ white; the triglyphs blue, their channels black and their guttæ white, and the more extended parts of the frieze and the cornice as well as the architrave are of light yellow. We see that red, a brilliant colour, designated the greater part of the principal lines; that blue associated with black in the triglyphs and their channels formed an harmonious ensemble distinct from the neighbouring parts; also that the dominant colour, light yellow, produced a much better effect to what it would if the most intense or the most sombre colours had predominated. Finally, the colours were distributed in the most intelligent manner possible without being motley, presenting a variety and lightness in the tints with easy separation of parts.

Greek Painting.

Upon the authority of Quintilian painting was considered by the Romans to have flourished chiefly in the age of Alexander and his immediate successors. In the mere mastery of the technical difficulties of the art it doubtless did; but the great period of Grecian art was from Cimon and Pericles to the time of Alexander. Polygnotus of Thasos, who settled in Athens about 460 B.C., established painting in all the essential principles of the art. Character, form, and all that is essential in colouring were thoroughly attained by Polygnotus and his contemporaries. In the succeeding generation the art was rendered dramatic by Apollodorus, Zeuxis, Parrhasius, Timanthes, Eupompus and their contemporaries. The imitation of the local and accidental appearances of objects was added to the generic or essential style of Polygnotus; character

and form were enhanced by the addition of local colour and tone and dramatic fidelity of composition. The Alexandrian period, which was one only of refinement, did but add variety of method and effect to the already perfect art of the preceding age. The great masters of this period were Pamphilus, Apelles, Protogenes, Euphranor, Nicias Nicomachus, Aristides, Pausias, and others—in essentials probably all more or less equal, yet each striving after distinction by undue attention to one or more of the mere technical qualities of art. Thus we find one distinguished for grace, another for high finish, a third for facility, others for peculiar effects of light and shade or bold foreshortening, some for ingenious or novel devices others, again, for skilful grouping, and one only, Aristides of Thebes, for expression. As these mere technical excellences of art were made thus prominent the higher qualities of art were overlooked by the succeeding generation of artists, and the form became paramount over the essence, even with the very pupils of these great painters. This caused the rapid decline of Grecian art which immediately supervened on the close of the Alexandrian age. A glance at the similar revolution of taste and practice which took place in Italian art in the beginning of the seventeenth century will render this change intelligible. The school of the Carracci, though a partial revival at the time, was, when compared with the Roman and Florentine schools at the commencement of the sixteenth century, just such a transition from essence to form, from sentiment to sense, as that which it has been endeavoured to show took place in Grecian art immediately after the period of Alexander. It should be borne in mind that the paintings of Pompeii are the ordinary chamber decorations of an insignificant provincial town, and that they were executed at an age when, according to Roman writers, the art was in a disgraceful state. If we compare the Pompeian remains with our own provincial, or even metropolitan chamber decorations from the establishment of the arts down to the present day, we shall find the comparison greatly in favour of the ancients. There have been, however, many noble specimens of the art discovered at Pompeii and Herculaneum, both as regards facility of execution and composition. The great mosaic *Battle of Alexander*, discovered in 1831, is, even as a composition, worthy of any age of art, and has much merit of execution, even as a mosaic, though, from its great superiority as a work of art, it is evidently the copy of some celebrated picture of some former period; it abounds in skilful foreshortenings, and is, on the whole, a noble battlepiece. In the mere mural decorations also of Pompeii there are many successful attempts at perspective. It is well known that the Greeks were acquainted with perspective, for perspective scenery (scenography) was introduced on the Greek stage as early as the time of Æschylus, though, perhaps, not generally until the time of Sophocles.

The Epic Spirit in Sculpture.

The whole scenery of a picture may, of course, be regarded as *dramatis personæ*, as much so as the painted actors of the canvas or the living actors of the stage. That rock is a stony-hearted villain: that flower is your sister asleep: the brook is a beautiful idiot, babbling nonsense. But apart from such generalities, be it observed that painting is romantic and that sculpture is classical drama, which expression may be taken as meaning, in the one case, a drama truly such, in the other, a drama conceived in an epic spirit. A. W. Schlegel reports the saying of Hemsterhuys, that the ancient painters were too much of sculptors, and that the modern sculptors are too much of painters. According to the above interpretation the remark means that the ancient pictures were epic in their tone and that modern sculptures are more truly dramatic; that the ancient artists could not save themselves, but whether with the pencil or the chisel would give a Classical or epic meaning to their works. For, as a general rule, in sculpture (that is to say Greek sculpture) the face is without expression, at least of present feeling, whereas in Christian art it is all in all. Wherever character can be traced in the countenances of Greek sculpture it is almost always an unmoved character, a character without present energy, but hinting a thousand probabilities of past history, a thousand possibilities of the future, past and future—the symbols of those epic and lyrical tendencies which go to form the classical drama. The epic tone of sculpture is also shown by the fact that often a character has no individual expression whatsoever, and is recognised only by some conventional mark attached. “Take from Apollo his lyre,” says Sir Joshua Reynolds, “from Bacchus his thyrsus and vine-leaves, and from Meleager the boar’s head, and there will remain little or no difference in their characters. In a Juno, Minerva or Flora the idea of the artist seems to have gone no further than representing perfect beauty, and afterwards adding the proper attributes with a total indifference to which he gave them.” Instead of making the statue speak for itself, as all purely dramatic art is bound to do, there is added to tell the tale an attribute, as Sir Joshua calls it—an arbitrary sign, a shorthand narrative.

NOTES AND COMMENTS.

OBJECTIONS to the sale of the Hunter collection of coins have been formally lodged by the Senate of Glasgow University with the Universities' Commission. Dr. HUNTER'S will, it appears, contains instructions that the collections were to be delivered to the principal and faculty of the Collège of Glasgow, "to be kept and preserved by them and their successors for ever, to and for the use of the said principal and faculty of the Collège of Glasgow." Whatever effect the Universities (Scotland) Acts of 1858 and 1889 may have had in transferring from one body to another the management of property belonging to the university or of property held by the university in trust, there was no authority given for converting any property held in trust into an asset of the university. Of existing university bodies, the Senate is the one among whose members the successors of the principal and faculty are to be found, and consequently they take a special interest in anything that may affect the Hunterian collection. The Senate therefore, in the first place, object to the sale of the Hunterian collection of coins or of any part thereof, because the testator directed that the collection was to be kept and preserved for ever for the use of the university. Secondly, the Senate object to the proposal because it commits a power of sale to the university court that contains only one permanent member. The Senate object, in the third place, to apply the proceeds of the sale to purposes outside those contemplated by the testator, viz. to the maintenance or extension "of other libraries and museums" belonging to the university. Finally, the Senate object because the proposal which it contains is highly inexpedient and inopportune. It is inopportune because it proposes to alienate from the university a collection which would be most effective for the teaching and illustration of history at the very time when the commissioners are proposing to establish a Chair of History—a time, too, when universities elsewhere are using their best efforts to procure similar collections. At the date when it came into the custody of the university the Hunterian collection of coins was the most important and valuable in the United Kingdom, and even at the present time the only collection in this country which excels it is that in the British Museum. No other treasure in its keeping has contributed so much to the fame of Glasgow University; and, besides the uses which the collection subserves to members of the university and others in Scotland, numerous communications and inquiries involving references to its contents are received from universities and other learned bodies, as well as from persons interested in art and archæology in foreign parts. It is inexpedient to authorise the sale of this collection—a collection which could never by any possibility be replaced—for such sale would greatly injure the reputation of the university at home and abroad, would cripple its resources for teaching and illustration, and would take away all hope of similar benefactions being made to it in future.

THE site for the proposed City Hall in New York has been selected, but it is not generally approved. The façade will be on a line with the existing hall, which is to be removed, but the Court House, which is associated with many scandals, is to be preserved. The design for the new building will be obtained by competition. Drawings are to be submitted not later than September 1. Six designs will be selected by three architects to be nominated by the Board of Commissioners. One out of the six will be chosen by the Board, and the architect, if of adequate standing, will be appointed architect for the building. His commission will be 5 per cent. on the first million of dollars expended, 4 per cent. on the second million, and 3 per cent. on the remaining outlay. The authors of each of the five designs which remain will receive 2,000 dols. The new hall is to provide accommodation for present needs amounting to 270,000 square feet, and it is calculated that from 50,000 to 100,000 square feet will be required in the future in addition. It is desirable that each storey should have at least 70,000 square feet, in order that it may not be necessary to have any considerable part of the building of a greater height than five storeys. The building is to be throughout of fireproof construction, and especial care is to

be taken in imparting security to the offices in which public records are kept. The sum named for outlay is 4,000,000 dols., which is insufficient. The drawings are to be on a scale of 16 feet to the inch, except the block plan, which is to be 64 feet to the inch. Shadows or shading will not be allowed, and the perspective is to be without accessories. A single figure is allowed to indicate scale. The drawings are to be without any mark, to be on paper measuring 29 inches by 44 inches, and to be sent flat in a portfolio.

WHITEWASH is not always an evil thing. In the eighteenth century it was the means of preserving some remarkable examples of French sculpture. The great CONDÉ, who always sought after grandeur in whatever was undertaken by him, erected a monument to his father, which exemplified the height attained by sculpture in the age of LOUIS QUATORZE. When, at the close of the eighteenth century, the Revolutionists were struggling against Europe, there was a demand for cannon, and many a work of art was sacrificed to obtain materials for casting them. The Condé monument was doomed. Some sympathising friend of the family covered the statue with a thick coating of whitewash, and the Committee of Artillery, being probably in a hurry, came to the conclusion that the figures were only made of plaster, and rejected them. They were then lodged in one of the musées until 1816, when they were returned to the family. The Duc d'AUMALE, when they came into his possession, with the aid of M. DAUMET, set them up in the chapel of the Château of Chantilly, where they guard the cenotaph in which the heart of the great CONDÉ is mouldering. It is to be hoped that the statues will never be again reclaimed as war material, for the thickest whitewash could no longer deceive inquisitors.

THE syllabus of the lectures on architecture, building construction and modern practice, by Professor BANISTER FLETCHER, which will be delivered at King's College, deserves the attention of students of architecture and building. Care has been taken to give unity to the course. It is also a great advantage for students to possess a museum of casts, models, photographs and drawings which illustrate the history of architecture as well as the progress of construction. The Carpenters' Company have most loyally aided Professor BANISTER FLETCHER in securing the best appliances for the instruction of the students.

For some time past there has been agitation in Cardiff respecting a new town hall, and some of the local architects have taken time by the forelock, since they have endeavoured to gain the approval of the inhabitants for their plans. The Marquis of BUTE should have much to say on such a project, for he is not only a most generous and self-sacrificing landlord, but he has expended more money on architecture than any of his contemporaries. When therefore it is said that while his lordship is anxious to assist the Corporation in providing such additional or improved accommodation as may be necessary, still, after giving the whole matter most serious consideration, his lordship has arrived at the conclusion that there is no necessity for the removal of the town hall from the present site, the people of Cardiff would do well to reflect on the suggestion. The Marquis considers that Cardiff has at present an adequate site, but he is willing, if the Cardiff Corporation so desire, to sell them for the purpose of erecting police courts a portion of the lower end of the Cardiff Arms Park. Lord BUTE desires to facilitate the carrying out of improvements or extensions, but he hopes, in the interests of the ratepayers, that no expenditure will be incurred beyond that necessary for providing accommodation for the proper conduct of various affairs of the Cardiff Corporation. The people of Cardiff are no doubt very wealthy, and we fear we must add very stingy. Just now it is desired to launch into expense for the benefit of some of the inhabitants, in the expectation that eventually the Marquis of BUTE will assume responsibility for the outlay. At present there is a desire to obtain plans and to expend 50,000*l.* on a building, but it is to be hoped the selection of plans or tenders will not be entirely left to the local authorities.



PHOTOGRAPHED BY BEDFORD LEMERE & CO.

21st 1893.



INK-PHOTO SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ROMSGROVE.
R, Architects.



PHOTOGRAPHED BY BEDFORD LEMERE & CO.

April 21st 1893.



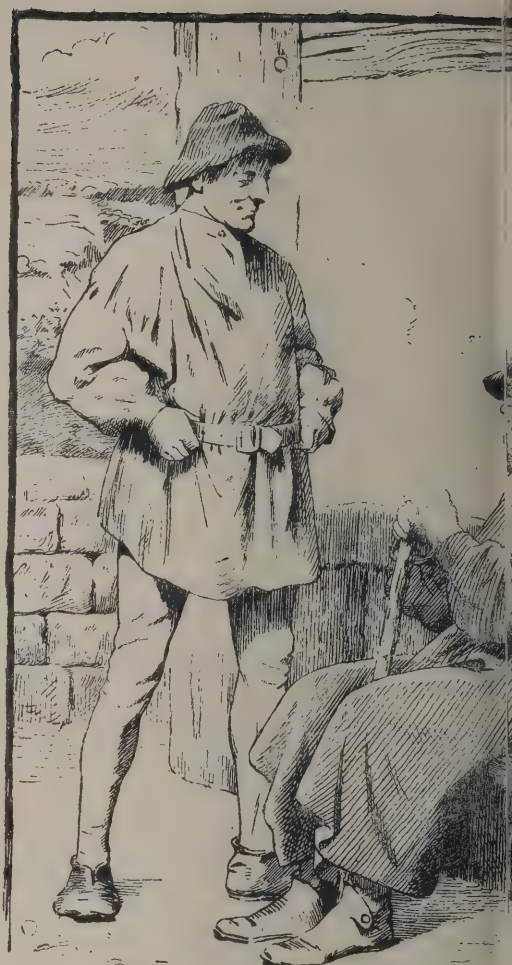
PARSH: ENTRANCE FRONT.

ETO, Architects.

NO. PHOTO SPRAY VE & 11 X 5 1 LAST HALL NO STREET FETTER LANE E.C.



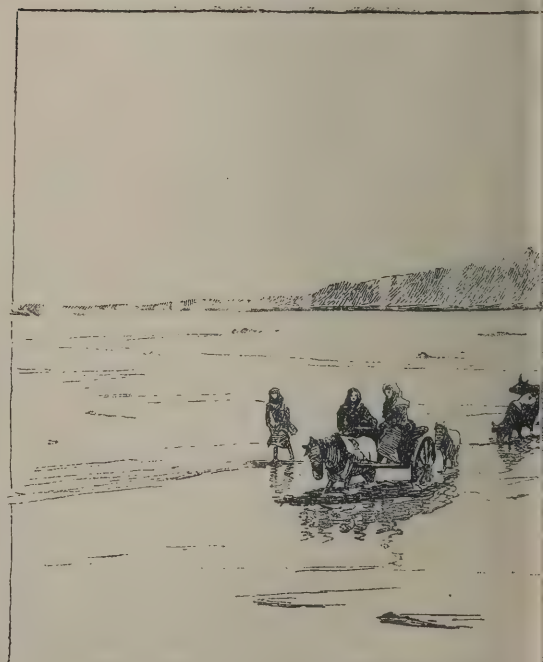
TRAFALGAR SQUARE. BY H. M. MARSHALL.



GOOD MORROW, GAFFER! BY H. S. M.



AN OLD FIDDLER BY BIRKET FOSTER.



CROSSING THE FORD. BY



.A.



ST. PAUL'S, FROM FLEET STREET. BY E. A. GOODALL.



NOX ÆSTIVA. BY E. RADFORD.



ALLAN.



"THE BEGGARS ARE COMING TO TOWN." BY NORMAN TAYLER.

CIETY OF PAINTERS IN WATER-COLOURS.

ILLUSTRATIONS.

HEWELL GRANGE, BROMSGROVE.*
[MESSRS. BODLEY & GARNER, ARCHITECTS.]

BATSFORD PARK, MORETON-IN-THE-MARSH.*
[MESSRS. ERNEST GEORGE & PETO, ARCHITECTS.]

VIEW IN RATISBONNE.

* From photographs by Messrs. BEDFORD LEMERE & Co.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AFTER the business meeting held on Monday evening, an ordinary meeting of the Institute of Architects was held, Mr. H. Currey, vice-president, in the chair.

The deaths were announced of Mr. J. S. Crowther, architect, Manchester, and W. C. Tuke, also of Manchester.

Examination of Building Stones..

A paper under the above title was read by Mr. H. W. Burrows. He described the modes of judging of and testing building stones, and considered their relative merits in regard of structural and weather-resisting properties. He classified the leading building stones under the heads of granites, sandstones and limestones, more especially referring to the two latter kinds in regard of their chemical composition, and the disposition of the components. Prior to adopting stone for use on a building, it was necessary to examine its power to resist disintegration by crushing, shearing stress or weathering. If the architect could visit the quarry and personally inspect the beds, it would be all the better. There were three principal tests, viz. mechanical, chemical and microscopical, the last of the three being the most important. As to the mechanical tests, the chief related to tests by crushing small cubes, the customary method being to take the mean of the results; but as the strength of a chain was represented by its weakest link, the factor of safety should be the sample which least withstood the strain. He then referred to the familiar experiment with bedding cubes on lead or pine when the test object was subjected to shearing strain. It was also advisable to test samples of building stones under the action of frost, artificially, as easily could now be done, in absence of actual freezing. Another ordinary test was to show the amount of absorption of water. Limestones and sandstones, for instance, which showed the same powers of absorption of water, proved very different in powers of resistance to crushing or shearing strains. A rough and ready knowledge could be got by simply eye estimate of the earthiness or friability of the texture of the different species, but as a matter of fact an inter-comparison of limestones and sandstones was of no practical use. Another mechanical test was to boil cubes in a solution of sulphate of soda and then weigh and crush them. But he did not see that any natural influence ever attacked stone in this manner. A closely allied test was to immerse cubes in a diluted mixture of 1 per cent. sulphate of soda with hydrochloric acid, which he also considered to be of no practical value. In regard of chemical tests, to which much interest now attached, he believed they were misleading unless supported by other methods of tests. Quarry owners often enlarged on the large amount of silica in the special products of their quarries shown by analysis. If this were conceded it would prove that sandstone was more durable than limestone or even granite, an hypothesis which was manifestly absurd. In fact, experience had already shown that the presence of silica, whether in large or small quantities, gave no criterion as to weathering properties. Cohesion of particles was the true test of a stone. Scattered grains of sand did not by any means improve the character of stone, the question being the disposition and not the amount of silica, and in this investigation chemical analysis was no guide. Samples of chalk, limestone and marble might be equally pure specimens of carbonate of lime and absolutely identical in analysis, and yet no one would elect to build in chalk when he could have marble or limestone. Having explained that the difference lay in the fact that the carbonate of lime was amorphous in chalk, semi-crystallised in limestone and crystalline in marble, he went on to refer to great variations in structure in crystalline stones. According to chemical analysis, stone crushed to powder was of equal strength with solid rock as far as its components went, and therefore sand should be classed as the most stable of materials. All this showed that cohesion of particles was of far more importance than the actual nature of those particles. The third or microscopical tests showed the manner in which the particles were built up. He then gave the method of conducting microscopical tests, which we need not recapitulate, and proceeded to show a large number of photographic examples of sections of stones by means of the lantern. The lecture was further illustrated by numerous diagrams and classified lists of building stones.

Mr. Percival Gordon Smith proposed a vote of thanks for the paper, which was seconded by Mr. Henry Dawson and supported by Mr. F. W. Rudler of the Museum of Geology, Mr. W. Topley of the Geological Survey, Mr. Harris, Mr. G. A. T. Middleton, Mr. J. M. Bryden and Mr. William Woodward.

The vote was passed by acclamation, and the proceedings terminated.

LOCKS AND SAFES.*

THE subject of old locks and their keys is one which has received a considerable degree of attention, and those which are noticeable chiefly for the beauty of their artistic forms have taken precedence, being treated popularly from time to time in illustrated periodicals. Modern inventions have also created interest, but interest of a different kind, more utilitarian—in fact, scientific. It need not, however, be taken for granted that the two views are incompatible, or, in other words, that a sharp line must be drawn, say, at the end of the seventeenth century, to divide the artistic from the mechanical. As a matter of fact the gradual growth or evolution of the locks in common use to-day can be traced, with but few missing links, from the earliest forms. Overlaying, and sometimes almost obscuring, the mechanical intention is the work of the artist, this being invariably characteristic of the period when the artist-worker lived. This is true no less of Roman times than when French and German smiths of the Middle Ages encrusted their lock-plates with Gothic mouldings and carved their delicately-shaped key-bows. As the styles of architecture and its kindred arts succeeded one another, age after age, the decoration and treatment of locks and their keys were affected by the same changes; mechanically they altered also, not, however, always for the best when looked at from the modern point of view. One cannot, therefore, say that their advancement in the two respects has been together, but the connection between the two is at all times interesting and often instructive. Mechanical invention, pure and simple, is just as much subject to the general laws of progress as everything else. So also is the work of the designer, mechanic and designer being equally inventors in the true sense of the word. When you have the two qualities combined in one man, as they were frequently in the Middle Ages, you get a result that is self-evident, and although it cannot be said that the progress then in craft equalled the progress in art, there is yet a greater harmony between the two than when they are separated, or in any other way specialised. Whilst the inventive faculty has had, and still has, so much to do with the locksmith's craft, this is hardly the opportunity to analyse it; but I think the axiom will be readily granted that, viewed broadly, it is not purely a matter of spontaneous genius or mere mental accident, but is, as I have suggested, a faculty admitting and responding to cultivation.

Before entering upon the subject proper of this paper, there is one minor branch that may be mentioned. I refer to the use of seals. The effect of the seal is an ethical one, as long as the moral tone of the community is good. The Egyptian storehouse keeper sealed up his large earthenware corn jars, using clay as the material to take the imprint of his matrix. One notable Biblical instance occurs when Darius and his lords sealed the door of Daniel's den. No lock was needed where the king's device had been impressed, and the king alone could undo his own work. The survival of sealing to the present day, for securing our Post Office despatches and Customs vaults, shows that where there is an obvious intention on the part of authority that certain things shall be left alone, that wish is respected. The use of a personal or corporate device, first and still employed as a means of identification and of legal power, readily lends itself to this purpose.

Amongst early fastenings, those intricately made by knotted thongs or ropes should not be omitted, for with these nomad pastoralists tied up their tents. The Gordian knot will, of course, occur to everyone in this connection.

No one has more clearly traced the early growth and sequence of lock mechanism from the primeval door than Lieutenant-General Pitt-Rivers. Doing for locks what he has done for weapons, for certain conventional designs, &c., his contribution to their history is of great value. Besides tracing their development, he has followed the various types along the known lines of early trade, showing how they became distributed.

The present wooden lock of Egypt—the Dub'beh—supposed on fair grounds to be the same as that used 4,000 years ago, has been illustrated and described so often that it is almost needless to do so again. That the two locks are identical is highly probable; the water-raising "shadoof" has remained through this long period, and there are other evidences of similar mechanical crystallisations in the East. Indeed, a recent description of a wall-painting in the temple at Abydos, given by the late Miss Edwards, almost proves the point. She

* A paper by Mr. Harry W. Chubb, read at the meeting of the Society of Arts on April 12.

writes of "Rameses II. . . in the act of opening the door of a shrine by means of a golden key formed like a human hand and arm." This closely agrees with the oft-quoted account—now 100 years old—given by M. Denon, of a painting in the great temple at Karnak, and both descriptions are true of the present day lock and key.

It is quite reasonable to suppose that the first barring of a door was done by means of a cross beam, either dropped into sockets or sliding in staples fixed on the door; and it is equally reasonable to suppose that if it slid, a vertical pin dropping into a hole through the staple and beam together, kept the beam in place.

If the beam was inside the door, and had to be released in order to slide it back, then one kind of key was necessary to take out the pin. Of this I shall speak presently. But if the beam was on the outside, then the locking pin must be hidden, and can only be reached either through a hole in the beam, or else through a hole in the staple. The Egyptians adopted the former method; other primitive peoples adopted the latter. They—the Egyptians—shortened the beam into a long bolt, and made it hollow for part of its length, so as to reach the pin, hidden in beam and staple through the beam itself. The key, which was pushed up the hollow, had pegs on it to match the pins which held the bolt—for the one pin was now multiplied. When the key was well "home," it was raised, and so its pegs lifted up the pins out of the way, leaving the bolt free. Then the bolt was drawn back by the key, the pegs of the latter filling up and engaging with the holes till then filled by the pins. You notice the shank of the key is the arm; the pegs are the fingers of the hand. We shall see how this principle of dropping pins—true tumblers—was adopted with variations by the Romans.

Now as to another class of primitive locks—those in which the pins were reached through a hole in the staple, and not through the bolt. There is good reason to believe they were once remarkably widespread, though now chiefly found on the fringes of culture. You see them at the present day in some parts of Scandinavia, in the Hebrides and Faroe Islands, and the peasant of Normandy still makes them for his gates and barns. They have also been observed upon the West Coast of Africa; and Herr Andreas Dillinger, of Vienna, whose name is known in Germany in connection with the historical study of locks, states they are in use in the less frequented parts of Galicia, Roumania and Servia. The hole in the staple by which to get at the pins is a horizontal one above the bolt. The pins are square in section, and are notched on their sides for the key to pass and get into position before being lifted. The key is usually flattish, with little side projections which engage the pins. After they are lifted it is necessary to pull back the bolt by hand, thus making a marked and essential difference between this lock and that of Egypt, in which the bolt is withdrawn by the key itself. They vary in detail, some having two sets of pins, the key passing between the sets; in others the pins have holes right through them for the key, not merely side notches.

The next two classes of primitive locks are those in which the beam or bolt was mounted on the inside surface of the door. In this case, if fastened by the tumbler pin, it would not be so necessary to conceal it as when both were outside the door. There are some curious sickle-shaped pieces of iron found now and again, which look as if they were made for the purpose of putting through a hole in the door, and pulling up or pushing up the pin. Perhaps they simply engaged the bolt in a direct fashion, and, being turned from the outside, moved it to and fro. But they vary in their outlines too much for this supposition to be probable, some being full sickle-shape, and others only slightly cranked or bent, and in some well-preserved specimens their ends have been carefully shaped, as if to fit a hole exactly. They have been found at many places in France and Germany. General Pitt-Rivers well authenticates some he himself found near Lewes to the late Celtic period. In connection with these he also discovered some coins cast in tin of debased Greek design, and points out how this shape of key agrees precisely with a description given by the Greek writer Eustathius in the twelfth century, who states that this kind, although still in use, were considered antique. This coincidence is extremely curious and interesting, and makes one wonder if the Phœnicians had been the agents of its distribution.

At last we come to the fourth primitive type of lock, the bolt or beam being still inside the door. In this type the bolt was kept out by the projection of a spring or springs, which spread out against the side of the staple in the same way that an unwilling boy spreads out his arms and legs against the jambs of a doorway through which his schoolfellows try to push him. The first function of the key is to compress the springs. It is a flattish one, with return prongs or hooks on its end. It is first passed through a horizontal slit in door and bolt, then turned a quarter-circle, and pulled. The pull brings the prongs to bear upon the springs of the bolt, making them lie flat, and so clear of the fixed obstructions at their ends. The bolt is

then free to slide back, and this is effected by simply sliding back the key, for its prongs are now embedded in the bolt. The keys of these locks are numerous found among Roman remains, and locks of this kind are stated to be in use still in Norway.

Having thus very briefly stated what is known of the primitive kinds of locks, let me take the last type, and show how closely allied its mechanism is to that of the Roman padlock. Looking at the diagram, you will see the lock consisted of two parts—a body and what, for want of a more accurate term, may be called a hasp or bolt. The hasp carries on its lower side a pair of spreading springs, and these enter a hole in the end of the body when the two pieces are being put together. When the hasp is pressed right "home," the springs, which during the operation have been gradually closed up, now fly out inside the body, and so hold the two parts together. To take them apart the springs must be compressed, and this is done by the key, which is pushed through a hole in the body against their sides near the point, and slides along them. The springs are simply flexible barbs.

It is no wonder that loose, portable locks, like those used to secure baggage of all kinds in transit, should become well known and distributed, especially along the ancient lines of trade. But as this style of padlock is found to be the almost universal one now in China, one is tempted to ask who was the first and true inventor, Roman or Celestial? They are seen, too, all over the East, being shaped and decorated in ways peculiar to their own countries. Here I have a modern Japanese of dragon-shape, two others with hidden key-holes, and a fourth—Chinese—in form of a conventionalised dog. His tail turns up right over his body, and goes through the back of his head, its end forming the tongue. This is the hasp. To release it, the key enters a hole in his chest, and you push the tail right out. There are some bodies of Roman ones in the British Museum like this Chinese curiosity, but looking more like horses than dogs. All these have the diverging springs. There is one in the Indian Museum in which, to close up the springs, the key is turned as in an ordinary padlock of the present day, not simply pushed in, and a large class of Mediaeval padlocks—French ones more especially—are made like this. The Romans had other kinds of padlocks as well, the security parts of which were made like those of their fixed locks. Here is a copy of one made from an original at Pompeii.

Now as to the Roman fixed locks. Many archaeological "finds" indicate what these were, but none so clearly as those unearthed at Pompeii. I will show you on the screen some specimens photographed by a friend for me in the Naples Museum, and you will see from these, as well as from the wall diagram, how closely these locks are akin to the Egyptian. The bolt is now much shortened, and is concealed behind a front plate; it is still held, when locked out, by vertical pins falling down into it. The parts are now mostly, if not all, of metal, sometimes in a wooden casing or block. The pins vary in sectional shapes, being oblong, square and triangular, as well as round, and are pressed down by a flat spring. The key has projections or teeth formed on it, corresponding to the pins, and reaches the bolt through a hole in the front plate. The pins being pressed up by the key projections, the bolt is free, and can slide to and fro, precisely as in the Egyptian lock. Roman keys are found much more commonly than their locks, and some are of such shapes that it is not always easy to say what their locks were like. There is a key with its "bit" angle shaped; one angle is cut to operate bolt pins in the way just now described, the other is pierced with holes, as if to pass fixed obstructions or wards. Many of the keys were undoubtedly turning ones, having solid stems called "pins," or else made with hollow stems called "pipes." The pipes were sometimes drilled right up, so that any dirt or other obstruction could be pushed through. I believe this simple device appears in three separate English patents, and not a year passes without some enthusiastic inventor rediscovering it, and offering to part with his idea for a consideration. Here are two old bronze keys of this kind, dug up in London. On the wall is a picture of one taken from Molina's "*De clavibus veterum*." This picture brings us to a class of Roman keys that is quite unique, and which, although well suited to present wants, is, strange to say, not in demand. These are the keys attached to finger rings. Whilst not found as numerous as those of other types, you cannot visit an antiquarian museum without seeing specimens of them. Their bits are as diverse as those of the larger keys. Here are five specimens on one of the show boards. These are replicas cleverly made after originals at Naples. A few only are found combining signets with keys on one and the same ring. It was the Roman wife to whom, as a bride, when crossing the threshold of her new home, the house keys were given. They were all here with one exception. That exception was the key that kept the wine. This her husband held. The hoops of the ring keys are all large, being of a size suitable for a masculine finger, and it is likely that they may have been specially for the locks that secured the wine amphoræ. Just now I suggested that it was a pity this

combination of ring and key is seldom met with in general use. Many years personal experience has shown me that it is an extremely convenient combination. The key folding behind the signet of this ring opens several locks *en suite*; there is less chance of losing it than on a chain, and its effect upon Customs' officers—even on a New York examiner—when produced to open trunks and bags is marvellous.

Here let me mention what there is bearing upon our subject among the objects recently found at Silchester, Hants. There are quite a number of iron hook keys of various sizes, with their prongs arranged in different ways; there is the iron hasp with barbed springs of a padlock, a bolt in bronze for a fixed lock, with perforations for triangular pins (this in very good preservation), and there are two of the neat little finger ring keys.

Coming down to the Byzantine period, one has to regret the absence of information about locks and keys. One need not wonder at this. "The empire preserved much, but did not add to the treasures of civilisation" (Garnett). In gold and silver work the Greeks still excelled, and the golden lions by the side of the throne of Alexius Comnenus, that sprang up and growled, no less than the mimic forest with automatic birds behind the throne, attest their mechanical skill. In all probability the existing forms of locks and keys, as regards mechanism at any rate, were adhered to.

I will now show you a few transparencies on the screen prepared from photographs of objects in the museum in Naples, very kindly taken for me by a friend. These will exhibit the characteristics of the Pompeian work. About the shapes and ornamentation of the key shafts there is no light Greek touch such as you find breathing through the higher forms of Roman art; still they have an interest of their own, and have not been previously illustrated.

At last, in the seventh century, and in the now more settled West, a metal-working personality appears, St. Eloy. He was probably the first to found what would now be called a "laboratory of art metal"; and this was in connection with his abbey. Three centuries later comes St. Dunstan, in early life working at the forge himself, and even later, when burdened with the heaviest cares of the state, still at his leisure fostering the growth of art in metal. Other great men, long since those times, have found relaxation in the blacksmith's art. I recently came across an old jingle, in which of Louis XIII. it is said—

Sometimes into his forge he goes,
And there he puffs and there he blows,
And makes both locks and keys.

This is said of him when he was young. Charles I. indulged his caprices in the same direction, and, later yet, Louis XVI.

With the commencement of the Mediæval period, we get to shapes of keys more like our own, and working more like them than the preceding types. The sliding and pushing have given place entirely to turning movements, the keys being either made pipe-fashion, to slide on to a fixed pin in the lock, or else made solid, and terminating in the projecting pin, which fitted a socket or hole cut in the back plate of the lock. Later on, the section of the pipe was not always circular; sometimes it was triangular, and the pin on which it was pushed was shaped to fit it. Of course, provision was then made for the pin itself to turn with the key. The outside of the key, too, was fluted, and the lock pin then became a barrel as well, revolving in bearings at both ends. But this is anticipating, for these varieties do not appear until Renaissance times.

One feels greatly tempted at this point to make an excursion into the wider field of metal-work in general, for it was then that the smiths' art began to take shape and prominence. Our study is but a small branch of the art not being specialised till modern times, and it is somewhat of a barbarism to strip off a lockplate from, say, a cathedral door, and show it alone. Unaccompanied by the graceful curves of the hinge straps that flow across the door to it, a good deal of charm is lost. With the introduction of the Pointed style in the twelfth century, the culture of ironwork, no less than of the other metals, begins to move side by side with architecture. The Church, becoming richer from her share in the world's increasing wealth, secures not only the services of the best laymen, but increases—especially in France—the number of her monastery schools in which the arts were variously taught. From these emerged many a masterpiece in iron, silver and gold, fashioned by hands that were guided not more by art feeling than by a love for the sacred edifice the work was to adorn. Besides, there was plenty of time to do what had to be done: lives of hurry were unknown. Even in those days the results were not taken as matters of course. They excited admiration and wonder. Witness for instance the compliment paid to Biscornette, a layman, the maker of the hinge-work for the doors of Notre Dame, Paris. They said he could never have produced anything so beautiful without the devil's help. Perhaps professional jealousy started this rumour; if so, it was all the more a compliment. At any rate he disappeared suddenly one day, and the secret methods he had discovered died with him (Burty).

These very early keys have their humble bows in symbolical or, speaking generally, in ecclesiastical shapes—trefoils, quatre-foils and the like. Most remaining to us are of bronze, and, like many of the finely wrought iron specimens of later date, have thus escaped the melting-pot that, from time to time as coffers got empty, engulfed art-work made in the more precious metals. Here is one with an almost spherical bow, pierced. This early lock is the ancestor, in direct and unbroken line, of the ordinary tumbler lock of to-day. It had a bolt prepared by a notch for the key to actuate—locksmiths call this notch a "talon"—and it was held in place by a tumbler. The tumbler, instead of moving vertically, was hinged. The word "catch" describes it better than tumbler. A part of it came down over the bolt to reach the key, and the first thing the key did as you turned it was to lift up the catch, then, as you went on turning, the key caught the bolt in its notch and moved it. The wall-picture, with the sliding door bolt, is one of these. You will notice the bolt has a hasp or tongue coming off at right angles to it, and this enters the lock, and is there secured by the internal bolt. Liger, I think it is, ascribes these locking bolts to the thirteenth century. You can see them on the cathedral doors of Chartres, Rouen, and in some of our own cathedrals, and I once met one in a very unexpected place. This was on the door of the inner temple building at Kandy, where the piece of ivory called Buddha's tooth is kept. Presently I will show you a photo of it. The surface decoration of the lock has nothing Gothic in it, and it did not look imported, but no one knew its age. Within the same building was another surprise, the iron grille surrounding the tooth itself being fastened with two Chubb's padlocks.

Besides these thirteenth-century locks with the single tumbler, those with fixed wards were in use, their keys showing numerous and intricate slits and perforations to pass over and around them. Warded locks appear to have been the chief kind used for many centuries. Amongst the primitive we found four types; at this stage we have but two, the letter padlock does not come until the commencement of the seventeenth century.

Certainly the most beautiful specimens of keys are those we now meet with belonging to the fifteenth and early sixteenth centuries. A good specimen authenticated to 1530-70, and now at Frankfort, is shown in diagram. Others in the Florence Museum I will show on the screen. There are a few at South Kensington, and some in the Musée Cluny. For perfect proportion in all their details and minute workmanship, they have never been excelled, even by the later Renaissance keys. Their four sidedness and breadth gives them a strong, sturdy look; but this is lightened by the gracefulness of their pierced tops and sides, allowing the same play of light and shadow that you get through the tracery of a Gothic window. Hence flat pictures alone do not show their beauty; you must see them in order to be able to appreciate them. Of course they are awkward to hold, and you could pick their locks; but such criticisms are the property only of the nineteenth century—the century which commenced by making roses, flowers and branches in cast-iron for suburban villa gates, and has not quite got out of the habit yet. Now, also, we get the highly-ornamental lock-plates of French and Flemish make, the Italians devoting themselves chiefly to the adornment of sword-hilts and other articles. The French locks, and even escutcheons, showed considerable skill in adornment. The mouldings of the traceries upon them are made of layer upon layer of saw-pierced plates, one plate on top of another, their edges forming the members of the miniature mouldings. Where there are no figures or other devices, to which the traceries are only secondary, there is sometimes a background of brass. This gives a contrast in colour, and adds effect, for traceries are primarily intended to be seen by transmitted, and not by reflected light. If by reflected light, then the mouldings must be deep, so as to give rich shadow.

The German work of this period excelled more, from the artistic point of view, in the decoration of their lock plates than in fine keys. To begin with, the outlines of the plates are more fanciful. The surface decoration of the plates consists of a single thickness of metal, cut out and embossed to represent conventional flowers and fruit growing on stems that branch out gracefully from below the keyhole. The converging branches thus form guides by which to find the keyhole on a dark night, or when, from other causes, it was difficult to hit upon it (Wyatt). Recently this idea of external projecting guides to a keyhole was patented in England. There is an interesting thing about these German lock-plates that partly accounts for their shape. Their bolts were generally spring ones, and to get long—though not always easy-acting—springs to act upon them, the end of the plate was made much wider, in order to hold and cover them. Hence, you see, there is a direct result of form springing from utility. You can see it in these old German locks I have here, obtained in Nuremberg. On another board is a copy of a Japanese lock-plate of similar shape, but this shape, though common to many Japanese locks, is not, I think, owing to the same cause. One can tell to what

extent the Germans prized their pretty plates when it is known that their owners carried them from place to place when changing residence (Labarte).

(To be continued.)

PHOTOGRAPHY IN RELATION TO ARCHITECTURE.*

IN the course of his address, Mr. Allport asked, What is architecture? The art and science of building. It is rendered imaginative by the architect as delineated on paper or by models; or real, as executed in buildings. It comprises all the sister fine arts, as painting, sculpture and music. It therefore takes the highest standpoint in the fine arts. Yet the author conceives that photography must be satisfied with a comparatively low position, even though there be much scope for mind and imagination; for when compared with the art of architecture, its scope is dwarfed considerably; for true art lies in the architect, painter, sculptor and musician; not in the pencil, paint, marble, stone or instrument; in the man and not in the means. So the higher phases of photography lie, in a sense, in the acquired skill of the photographer—his choice of subject, his knowledge of light and shade—rather than in his camera and chemicals; in fact, in other respects there is more of artifice than art in photography, and it is an art shared in common with artisans, and a fit companion as such with arts and crafts. Such being the case, as soon as photography offers equal facilities as with architecture, painting, sculpture and music for expressing one's ideas, then, and then only, can any approach to equality be claimed. It is necessary to focus so as to obtain the finest effects of light and shade with a certain amount of depth, bearing in mind that too great depth will produce hardness of outline, whilst a medium depth will give that requisite artistic feeling and degree essential to convey to the mind the relative projections of the object, the definition and details of the buildings photographed. Whilst this will apply to all works, it has a particular bearing upon studies in architectural art and craft; and will intensify feeling, and give a vast help in the balancing of lines, in unity, breadth, repose, &c., which, taken together, form one grand whole.

It will be well to consider the various heads under which to the author's mind photography is of great practical use to architects, architectural students, and the constructive engineer; to surveyors, sanitary surveyors, and the lawyer—in fact, to all persons who have to deal with architecture and its practice. This granted, photography becomes a very material and important adjunct to the study of architecture both in theory and practice. And in the exemplification of architecture, through the medium of lantern slides, it may of course be regarded as indispensable.

1. It affords to the architect and student the advantages of seeing faithfully delineated architectural examples and subjects both of ancient and modern works. This conveys a guidance to their study which no other means with equal truthfulness affords. Thus, too, it becomes the medium of creating impressive comparisons of different treatment of architectural subjects of all ages and climes.

2. It allows architects to have copies made of their own drawings, whether they are sketches, studies or works to be executed. These, it need hardly be remarked, can now be reproduced by many processes in use, such as photogravure, photo-lithography, zincography, calotype, bromide, carbon, Woodbury, platinotype and other systems.

3. It affords the architect and architectural student the opportunity of carefully comparing the effects of various designs of buildings that have been published or executed, and allows them to make a comparative analysis, either for study or to enable them to judge as to what, in their opinion, is good and to be followed, or rejected as bad or inappropriate for their purposes, or present requirements in the working out of their designs.

4. It offers to the architect and student the advantage of making combinations from photographs of works and designs—combinations which they could not effect by the mere inspection of a building or by making casual sketches, even if time and opportunity permitted. This especially applies to examples of elaborate and intricate designs and works.

5. It enables the architect to take or have taken for him photographs of the buildings he is erecting. This practice is being extensively adopted, and no doubt will be more generally utilised in the future, either from an artistic or practical point of view, and with the following objects:—

(a) Photographs of existing buildings before their removal from the site to be utilised in the erection of new buildings, or to show damage or destruction done to them after the effects of a fire, storm, &c.

(b) Photographs of adjoining buildings showing relative position to buildings to be taken down, particularly as to light and air enjoyed previous to the building being removed either by building or adjoining owner. The neglect of this is often of serious importance and a cause of loss to the parties affected.

(c) Photographs of works in course of erection for such purposes as that of showing their state at certain dates for granting certificates, and also for keeping a record of works in course of erection, or of defective works done by builder, or the state of works before removal of any portion for intended alterations during their erection, or as exhibits to a client who may be far removed from the locality or abroad during the execution of the work at its various stages. It is quite possible, too, that the building owner might employ a photographer privately as a check upon both architect and builder!

(d) Useful indeed are photographs of building construction, particularly those of iron and steel, both as a record of their condition during manufacture, and at the building during fixing, or of sections and showing qualities, &c., after the effects breaking from the result of tensile strain or breaking loads, and after completion. These prove a very interesting and instructive medium for instilling into the minds of pupils and students a knowledge of quality of materials for, and in connection with, the principles of construction, particularly so in the absence of the opportunity of visits to the workshop or building during the preparation and fixing of works of this nature, and where details of construction are concerned.

(e) To the pupil and student photographic views of works in these several stages of progress enable them to thereby keep a record of what they have seen executed, to note defects, advantages or disadvantages, in a manner that cannot otherwise be so comprehensively obtained except by great labour, loss of time and expense. They also enable the pupil to have a record of what he has seen in its embryo condition on paper in the office until completely carried out in the building itself.

(f) To the architect and surveyor photographs of existing buildings taken before being interfered with are very essential, especially when taken under different lights and at various hours of the day. These, in light and air cases, will often save a client from serious litigation, and, when the latter cannot be avoided, may be the means of protecting him from heavy loss, damages and much anxiety, especially when used as rebutting evidence in legal cases of this kind, as in connection with dilapidations, dangerous structures, &c.

(g) To the architect, architectural student, antiquarian, surveyor and the sanitary surveyor. Photographs of important drawings which have passed through their hands can be taken, and any subsequent alteration of a detrimental or fraudulent nature subsequently made can be readily discovered. The same remarks equally apply to written or printed documents, of which time perhaps would not permit copies being taken by any other means. These are vouched for as accurate, and are often found to be of no more reliable and trustworthy proof than that of evidence given by experts as to handwriting, &c.

(h) For architects of large and elaborate buildings, who are in the habit of employing eminent sculptors or carvers to execute works from designs, models of their own, or direct from their own ideas and imagination, photographs of such work can be taken from the scaffolding so soon as executed. This work is often at heights and in such a position as to render it difficult or impossible after the removal of the scaffolding to take photographs of it. These often prove of great service in that they enable the architect to have the photographs taken with a light and shade, giving a definition from an artistic point of view not only as a record of what has been executed, but of the effect produced. They also help him to form an opinion of what is good and effective for future execution, and to avoid anything that has proved unsatisfactory.

Very much more could be advanced under general heads of the advantages of the use of photography by the architect, architectural student, architectural and sanitary surveyor; whereby matters of doubt can be solved and information obtained in the office in a few minutes by photography which might otherwise require days, weeks or even months to accomplish, and in some instances might never be obtained.

The author, speaking from the short experience of an amateur of two years' standing, could enumerate many instances of the great advantages he has already derived from the use of his camera, and in some cases its requisition has so unexpectedly arisen in urgent professional matters as to be of great importance to clients and himself; of these, however, he could not give anything like detailed particulars in a paper so limited as this.

To those who wish to qualify as amateur architectural photographers, whether out of love of art or of the numerous advantages derivable therefrom, it may be said that without good tools and appliances they will not obtain any satisfactory results. Having decided upon the size of plate to be adopted, let the camera be a special one for architectural subjects.

It must be rigid, and have a perfect turn-table, with a swing

* Abstracted from a paper read at the meeting of the Society of Architects on Tuesday, April 18, by Mr. William Allport, F.S.I.

back and cross-levels thereon, and it should extend forward and backward at least 30 degrees each way, for absence of distortion is a *sine quâ non* in recording facts. Especially should the turn-table be set perfect level, and the front and back fixed at right angles with it, otherwise the neglect of this in the using of the turn-table is apt to cause distortion if the camera is slightly altered either way.

The author's is a whole plate one, but so arranged that half or quarter plates can be used when so desired, thereby allowing double the number of views to be taken when using whole plates only. The lens should likewise be adapted for architectural matter capable of giving a clear and the finest definition possible, with parallel lines in every direction. The one now in use by the author is a portable symmetrical lens, which when properly focussed and adjusted gives excellent work and affords a good definition and flat surface. This lens is now superseded by a more recent one, called the patent concentric lens, absolutely free from distortion and imperfections incidental to lenses of general construction, and giving a still finer definition than the portable symmetrical lens does. Another important departure in lenses is the production by Mr. Dallmeyer of one that will give an object thirty miles distant. This, of course, is dependent on a very clear condition of atmosphere, and not such as appertains to this country in general or this metropolis in particular; but nevertheless it will, even in this country, take views of any buildings many miles removed. Time will not permit the author to go into all the details and requirements to enable a novice to become an amateur photographer or describe the various *modus operandi* of the science, or as to the most approved camera for architecture or plates, time shutters, dark room, ruby lamp, developing trays, dishes, chemicals, focussing, exposure, developing, varnishing, printing, toning, mounting, &c., or the making of lantern slides and other incidental accessories too numerous to mention, let alone entering upon their detail. There are now so many able works to be had on these details, and the information afforded in them is obtained from such well-known and reliable authorities, and the ready means are now so available for obtaining practical lessons, that these will afford a more satisfactory road to becoming an amateur architectural photographer than anything the author could bring before you at the present time, and he therefore proceeds to give you, through the medium of lantern slides, some examples of ancient and modern architecture.

A civil engineer writes that the use of the camera, both theoretical and practical, ought to form part of the education of the civil engineer; and he tells the old story of the engineer who every morning received progress reports of an important work many hundreds of miles away from him by means of photographs. This embodies all that can be said for the use of the camera to the civil engineer. Why, then, may it not be equally applicable to the architect in his profession and wanderings? The architect may often come across fine examples of architrave mouldings or other architectural details which may prove of great use at some future period when he is designing a building.

Instances of this sort might be multiplied *ad libitum*, but, given the idea as here attempted, architects, like engineers, will be able to discover at once where the camera may be useful.

It must not, however, be supposed that the author for one moment decries the practice of sketching, or would substitute for it the use of photography. The necessity of being able to sketch even moderately well must be admitted by every one as a great essential to all architects and architectural students.

In these times, however, of high pressure and necessity for quick despatch, particularly in this metropolis, photography is an important adjunct to architectural practice, and, as has been said, can be used with very considerable advantage by the architect; for instance, when on a tour, many objects of architectural or antiquarian interest often present themselves that time or circumstances will not permit of his sketching, but of which by means of a camera he is enabled to obtain views in a short time, and that under effects of light and shade it would be otherwise impossible to obtain.

Take, for instance, an elaborate entrance to a cathedral or a building at an inaccessible position or height. Even though a general view only of the whole of a building can be taken in an expeditious manner by the photographic amateur, it allows the sketcher more time for details, and for taking careful measurements of parts of interest necessary for applying in any works of a similar kind, and for adapting them to his own designs, and the effect of which the architect is enabled to form an opinion upon from his general photographic view. Therefore, to the architectural student let it be said, be as good a sketcher as possible, even though you aspire to become likewise an expert amateur photographer, and do not permit your art as an architect to degenerate into a mere photographic copyism.

As to the use of photography in connection with lantern slides for demonstrations of architectural subjects, the illustrations we have seen this evening fully show what a powerful

agent and adjunct it has proved to be in connection with photography in the development of architectural art, and in the illustration of such papers as are given from time to time by this Society.

The author is of opinion that a great advantage and good service would accrue to the profession in the establishment of a "National Architectural Camera Club," having its headquarters in London, with the view of fostering the development of architectural study and design. Especially would this be useful to the student and profession in the provinces, for the latter have not the same opportunity of acquiring knowledge and information as is enjoyed by those resident in this metropolis. Through the medium of such a club or society a department might be added for the exchange of architectural photographic views and the lending of lantern slides for lectures. The author will be pleased to co-operate with any in the profession with the view of establishing some such club or society in connection with the Society of Architects or any other architectural body in the metropolis, and has already mentioned the object in view to the promoters of a proposed "Central Photographic Club."

As an off-shoot to photography, as an adjunct to architectural art, examples of sun printing of copies from tracings of drawings and of architectural and engineering works can be made by the ferro-gallic or black line process, by which most useful and accurate reproductions of original drawings have been obtained. Examples of designs, working drawings and details are exhibited on the walls of this lecture-room. Many of these are tracings made by ladies and printed by the proprietress who presides over them.

And now a natural question presents itself for the consideration and discussion of this Society. Is amateur photography of any material benefit towards the advancement of the art or to the architect, engineer, student or surveyor, or is it to be looked upon as an amusing and fascinating pastime only?

The author of this paper puts forth for the Society's consideration, and that of the amateur in architectural photography who brings to bear a seeing eye and an understanding heart, that while it is not difficult to make a photograph, it is quite another thing to produce a satisfactory picture. To obtain the latter he must exercise to the fullest extent at all times the power of recognition, discrimination, and a careful selection of subjects, and with a wise, patient and attentive eye he will have to select his predominant object, and with varying aspect, and selecting a proper time that will ensure judicious light and shade with the requisite half tones. It is with these important and necessary adjuncts that the higher uses of photography can be best and advantageously employed in developing the beauties of architectural art, and thereby be enabled, through the medium of the lantern slides, to demonstrate them to the architectural student and lover of our noble art.

Does not photography materially therefore assist us in our guidance and judgment in architectural art, just as a fair criticism is a union of knowledge with self, and is it not so as respects photography in its relation to architecture, and indeed with all creative art? In this way does not the study and practice of photography lead the way to a fuller inquiry into, and comprehension of, architectural art, and by that means materially assist in the formation of a finer critical faculty, and in a sense giving to the mind forms and ideas communicable, just as languages do? And is not photography in a measure the conducive means to a better all-round excellence in architectural design, and thus give force to the creative power of the mind which, when well directed through the aid of photographs of good examples, will be materially assisted? It is towards a right direction of ideas that the advantages of good criticism will thus tend; in short, the architect and architectural student become better masters of their art and free from monotony of style.

SYMBOLISM IN ART.

A SERIES of lectures are in course of delivery by Mr. John Macdonell, LL.D., at the Royal Institution on Symbolism. After referring to the spontaneous expression of inward emotion by external gesture and the varieties of such expression which were found in different nations—adoration, for example, being indicated sometimes by kneeling, sometimes by raising the hand, and in other cases by kissing the hand or some sacred object—he pointed out in his first lecture that the extremes of passion were sometimes expressed by the same action—as in the instance of excessive joy or grief. The symbolism of different parts of the same country was sometimes entirely different, and a Lombard would find the gestures of a Neapolitan unintelligible. It might be even contended that writing was a debased or latent symbolism, and there were conditions in which it was a very inadequate form of expressing thought. One striking symbol of impossibility was two feet walking upon water. Then marriage ceremonies were often a reproduction of the forms of capture or of sale and purchase. A large region

of the subject was embraced under the head of colour, which in all ages and places had been used as the vehicle of expressing moral and æsthetic ideas. The lily had been a favourite token of purity, and the Blessed Virgin was traditionally always represented in blue raiment. Goethe had treated exhaustively this branch of the history of symbolism in his "Farbenlehre" and shown the associations which had most generally prevailed between particular colours and special emotions. Sickly yellow was, for example, the vehicle of contempt, as in the case of the Jews, who had been compelled to wear that colour. Our mystic poet-painter Blake had thought out, and particularly in his "Marriage of Heaven and Hell" realised, precise conceptions of the ethical value of colours. It was the function of poets and painters to translate the impressions of one sense by means of another. Diderot was fond of speaking of "sonatas in colour." Both painters and poets showed unmistakable preferences for particular colours, but the remarkable thing was that they were by no means the same preferences. Among the painters there was a generally prevalent choice of red and blue among other colours, whereas the poets of many ages and nations—Euripides, for example, Shakespeare, Spenser, Wordsworth, Tennyson, Matthew Arnold—found their epithets chiefly in white and yellow or gold, and the red and blue of the painters were relegated to a subordinate position. This interchangeability of different sensations was well expressed by Goethe in his simile of the three rivers having their common source in one mountain. It often happened in the history of language that words originally used in connection with one sense were extended to another. Another group of symbols consisted of tangible objects. Thus a sword represented a man, a spindle a woman. Among the Romans an auction was denoted by "hasta"—a spear—a term probably derived from conquest. In many tongues the hand intimated power and protection, and the glove always denoted protection. Certain birds and beasts were also invariably endowed with a symbolical meaning. The elephant was naturally used for wisdom and the lion for strength. The hare indicated timidity, the falcon vigilance, whilst the eagle was the bird of Zeus. Disastrous consequences might follow from misunderstanding the symbols of a savage tribe, as was done by the French navigator of the last century who accepted the brand from the Tasmanian, thereby, though he knew it not, taking up a challenge to war. In the case of great literary nations symbols became of world-wide range, as in the case of the club of Hercules, which in some instances had been confused with the hammer of Thor. The world was full of dead symbols, and virtually the same symbol played many parts. Who could doubt that the lituus of the augur, the crook of the shepherd, the staff of Æsculapius and the sceptre of kings all sprang from a common original? The lecturer also dealt in some detail with the forms of primitive conveyance by the handing over of a clod or piece of a tree or opening a door—forms attested by the enfeoffment and seisin of our English law—and illustrated the principle by drawings from early Anglo-Saxon chronicles exhibited on the wall.

In his second lecture Dr. Macdonell began by illustrating two important groups of symbolical ceremonies—those which are imitations of the acts to which they refer, and those intended to show in a dramatic way a change in condition or status. The Roman slave, for instance, might be freed before the Prætor by receiving a slight blow or tap, and being turned round. The Mediæval serf was often freed by *manumissio per denarium*. He held in his hand a coin, which was struck out of it so as to make it fall at the feet of the king. Sometimes he was freed in the churches by the master putting his hand on his head; and when in later time writing was employed, the writing was put on the serf's head, as if to show the words alone were ineffectual. When there was no clear distinction between things secular and religious, sacred and profane, the gods were often called as witnesses to the acts of men, and were even made parties thereto—a habit which in Christian times developed into elaborate forms of anathema inserted in ordinary legal instruments. In every well-drawn charter were several species of penalties—pecuniary, excommunication, divine judgment, with pointed reference to Judas, Korah, Dathan and Abiram. The lecturer cited in illustration a commination clause from a charter of A.D. 634. No usage had been more prevalent than the blood covenant—that is, the contracting parties drinking blood drawn from each other's bosoms, and references were given to this practice from Herodotus to modern times. The Scythians made their oaths by dropping blood taken from slight wounds into a bowl of wine, into which were dipped a sword, arrows, a battle-axe and javelins, and the bowl was then drunk by the contracting parties. In Central Africa much the same custom is still found. In tracing the wide prevalence of customs of this character we seem to be in the presence of a fundamental fact of human experience, an impression forced upon all races, that blood, the mysterious source of life itself, is the aptest emblem of a promise to be kept even unto death. After reviewing the various forms of marriage ceremonies—forms of capture and purchase, pouring of lustral water on the bride, eating bread

together, the married pair sitting side by side on the skin of an animal slain in sacrifice—the lecturer proceeded to examine the details of the English marriage service, and showed that it was a mixture of ceremonies, some of them symbolical and ancient, and that there could be found in it traces of primitive practices common to all Aryan nations. Before the time of writing most of the affairs of life—adoption, the doing of homage, the administration of justice, for example—were represented by symbolical rites. Somewhat akin to these is another kind of symbols—the signs or marks to designate beings real or legendary—what may be called the heraldry of mythology or legends—the symbols of the gods of Hellas, Rome, Egypt, and, equally numerous, those of the saints. Certain ceremonies served in lieu of statements of abstract principles. The coronation ceremonial was in a sense the constitution of a country. Not by the bare words of a written constitution, but by visible forms, by a striking and dramatic pageant, people were taught what their sovereign is and ought to be, and what are his rights and duties. In mythology, and indeed in all arts, there is a process of elimination and selection until loose, floating ideas finally crystallise in the aptest form. The free gestures of individual adoration stiffen into a liturgical formula; the unprompted prayer hardens into the form from which there must be no variation of a syllable; the rude, shapeless stone of the idol is gradually moulded into beauty. But at the moment of artistic perfection the symbolic element has almost departed.

ANCIENT MONUMENTS OF EGYPT.

A CORRESPONDENT of the *Times* at Cairo writes:—In calling attention to the following subject I trust I may not be understood or be thought to find fault with the remarkably able way in which the Gizeh Museum and the departments of antiquities connected with it are administered under Mr. De Morgan, to whose courtesy and energy I wish to pay my tribute. As, however, much of the cost of clearing the remains of the ancient buildings is paid for either by the tax on tourists—a large proportion of whom are English—or by the Egyptian Exploration Fund, it may be permitted to an English traveller to point out, through your influential columns, the serious and unnecessary destruction which accompanies some of the work of clearance.

At Kom Ombo, as was the case around so many ancient structures, a vast amount of *débris* has accumulated through the lapse of centuries. Both inside and out the building has been nearly buried. On the top of this *débris* many of the stone roof beams and slabs have fallen. This *débris* is now being removed. To replace the fallen stones in their original position would be a work of such great cost that it could not be faced, but to remove them by breaking them up seems nothing short of barbarism. This is, however, the course adopted. In order that the floor may be cleared, stone beams 10 or 15 feet long, and decorated with hieroglyphs, are riddled with wedges and then beaten to pieces.

The great difficulty of dealing with these vast masses of stone must be at once admitted. So far as my observation goes, supported by the opinion of others who are acquainted with building operations, it would not be a very hard matter to lower these stones until they rested on the floor of the temple, and there they would remain, bearing the evidence of what they were on their face. Whatever could by any possibility be preserved would then be preserved. To the student of archæology and architecture the preservation of these pieces and of all the evidence which the building can give is the only course that can commend itself.

In his work upon the temples and pyramids of Gizeh, Professor Petrie calls attention, with regret, to the destruction of similar beams by Mariette at the Granite Temple near the Sphinx, "when clearing up the place to exhibit at the festivities of the opening of the Suez Canal." Have not the tender mercies of the archæologist advanced since then?

I would urge upon those who have the administration of the funds that our very willingly paid contributions should not be expended in making the places neat and trim, but in preserving every stone that can be saved. One feels convinced that the present director of the museum, who is so deservedly popular, cannot have given his sanction to the destructive methods of procedure to which I refer.

At Der-el-Bahari I regretted to see stones being broken to pieces. No doubt the work of clearance would get on much more slowly were the stones laid on one side and preserved, but it must be remembered that to obtain a speedy result is not the one object in view.

The stones fallen are in many cases in as good a state of preservation as those still standing in their places. It is an open question whether in some cases the stones should not be once more set up, and thus a fresh lease of life given to the structure. No conjectural restoration is needed or should for a moment be tolerated.

RAEBURN AND SCOTTISH ART.

A LECTURE in connection with the Aberdeen Artists' Society was delivered by Mr. J. M. Gray, the curator of the National Portrait Gallery, Edinburgh. He said that though his lecture was mainly on "Raeburn," it also would include a brief review of the history and progress of portraiture in Scotland from the earliest times. The objects of the fine arts were to give pleasure; and these aims were attained by a dexterous and beautiful arrangement of the materials with which each art was specially worked. The most distinctive and especial pleasure which was derived from drawing came from its beautiful and specific arrangement of lines; and the first and most distinctive pleasure derived from painting came from its beautiful and satisfying arrangement of colours. But beyond this purely sensuous pleasure which was derived from a work of art—the result of technique and dexterous use of materials—another source of pleasure lay in its external and emotional power, and the power which it possessed to originate in the spectator a certain definite mental conception. This was a power that was common to all the fine arts, though each of them had its own special aptitude, its own special range of mental impressions for the production of which it was especially fitted. But in addition to these qualities of technique and adequate realisation of mental conceptions, there were other ways in which certain works of art might help them and interest them and give them pleasure. For instance, they preserved and recorded a fact, and portraiture did this; and while it might have very little sensuous charm or very little technical power, it might be useful as a record, and this was the main value of art. After dealing with certain of the early sources of portraiture, such as charters, coins and monumental effigies, Mr. Gray went on to speak of painted portraiture, and mentioned as one of the earliest specimens the altar-piece of Trinity College Church, Edinburgh, now preserved in Holyrood. He said there seemed to be no doubt that this was painted by Hugo Van der Goes, and it showed portraits of James III., his son, afterwards James IV., of Queen Margaret of Denmark, and of Sir Edward Bonkill, provost of the church. After referring to the portrait of James IV. at Keir, and the double picture of James V. and his second wife, Mary of Guise, in possession of the Duke of Devonshire, he went on to discuss elaborately the portraits of Mary Queen of Scots, mentioning the characteristics of the genuine portraits, and dealing with them according to the various periods, beginning with those painted and drawn in France. None of these could be assigned to the period of her residence in Scotland, but certain of them were known to have been painted during her imprisonment in England. Others were painted as memorial pictures after death, one of them being in Blairs College and another in the Queen's possession at Windsor. The only other authentic portrait was the alabaster effigy on her tomb at Westminster, erected by her son. After mentioning some lesser-known and intervening painters, the lecturer went on to consider in more detail the works of George Jamesone, of Aberdeen, giving a sketch of his life; Aikman, Ramsay, the pencil drawings of John Brown, and the medallion portraits of Tassi. Mr. Gray then sketched the early life of Raeburn, who, he said, was one of the swiftest painters known, and none had been able to give them more truly and effectively the counterfeit presentment of a man. Raeburn contemplated his subject from a distance, and discovered forms and contours that would otherwise have been lost sight of. He was an artist of the highest natural endowments, but he was interested in a thousand things beyond the pale of art. Housebuilding and shipbuilding, gardening and mechanics engaged his attention, and it was avowed that he was even interested in the intricacies of the law. Amid thousands of varied demands upon him he was a broad-natured, genial man of the world, enjoying life in the midst of a wide circle of widely-varied friends, and, as one of them remarked, nobody would have ever imagined him to be a painter till he took up brush and palette. No other painter was so exclusive a painter of portraiture as Raeburn. He was not like Gainsborough, who went into landscape, or like Velasquez, who went into the paths of sacred art; he left behind him absolutely nothing but portraiture—portraiture superb of its kind. No one could deny that Raeburn did not devote himself quite unreservedly to art. He was a great painter, who might have been a yet greater; and instead of remaining in absolute and effortless supremacy over Scottish artists that surrounded him, he should have settled in London and pitted himself against stronger men, and then perhaps an impulse might have come to him that was needed to force into living activity the very highest potentialities of his artistic nature. No Scottish painter was worthy to stand by his side—the only other artist that was fitted to do so was David Wilkie. Mr. Gray said he had not time to deal with modern portraiture, but Scotchmen now living, in the hands of their great townsman, Sir George Reid, and men like Orchardson and others, were maintaining in a high degree the efficiency and artistic beauty, and there was no prospect they would fail to leave behind them sufficient record of their visible appearance.

ARCHITECT'S FEES.

IN the Liverpool County Court, Mr. J. Havelock Sutton, architect, sought to recover 55*l.* 7*s.* from the proprietor of a restaurant for professional services in supplying him with plans for alterations and the addition of two storeys to the old Southern Hospital, Sefton Street, Liverpool, which had been used for some years by the defendant as an emigrants' boarding-house. The defendant paid 2*l.* 2*s.* into court, and denied further liability. The plaintiff stated that the defendant gave him orders to prepare the plans in question, and that they were duly delivered and accepted. A witness stated that he saw the plans delivered to the defendant, who expressed his satisfaction with them. The defendant denied that he had given the order for the plans in question. The judge having heard the case, said that on the evidence before him the plaintiff had clearly made out his case. Judgment would therefore be for the plaintiff for 53*l.* 5*s.* and costs.



The Future of Architecture.

SIR,—In referring the other day to the important architectural assistance the Persians gave to the Romans in the middle of the sixth century, I did not think it necessary in a short letter to notice other ancient examples of eclecticism. As, however, the history of architectural styles shows that every one with which we are acquainted was originated from some pre-existing germ or some model on which masons or trained artists had been working for generations, as in the example noticed above, I will now record one or two others, and conclude with a suggestion as to the future of architecture, or as I should rather say, as to the revival of a living spirit of British architecture, which is now in a melancholy state of coma.

But first to describe very briefly what the Roman army, every man of which was an artificer if not an agriculturist, must have seen in Persia about A.D. 500, just before Justinian decided to build a magnificent Christian church at Constantinople. When 200 years previously the Sassanian Artaxerxes and his successors, having conquered their enemies, were able to turn their attention to peaceful arts, architecture throughout Western Asia was at the lowest possible ebb, and it must have been with some difficulty that they gratified the desire, common with all powerful monarchs of the East, to exhibit their greatness by means of splendid buildings, although the stately character of the palaces of Darius at Persepolis must have been pretty obvious. But utility rather than magnificence seems to have been the object of the Sassanians, and consequently they adopted for guidance the comparatively insignificant buildings in Mesopotamia of an Arab dynasty, which generations before had ruled under the Parthians. The result proved that centuries of foreign invasion and oppression had not extinguished the art instinct of Iran. An architecture was developed which was so bold and magnificent that the Greeks and Romans of the sixth century deigned to imitate it. The main features in M. Flandrin's illustrations of the palaces at Ctesiphon, Serbistun and Firuzabad are entrance-halls 40 to 50 feet wide and 80 to 100 feet high, roofed over with an arch, and chambers on three sides communicating with one another and the hall, covered with domes of oval section. Contemporary historians describe these features and the walls as decorated with rich faience, in harmony with the national religion of Zoroastrians, and in the representations of Ormazd and Ahriman—principles of Good and Evil, and of the sun, moon and stars. Gold, silver and colours were freely used.

The Saracens having conquered and converted the Persians freely adopted the arts of their highly-cultivated subjects, but soon made the characteristic changes creating their own new style. In a wonderfully short time this noble race, no less energetic in peace than in war, founded cities, displaying their beautiful architecture not only in Asia but in Europe, Africa and India.

The Lombards applied the spirit of architectural eclecticism more boldly perhaps than any other race. Their structures were based upon Roman remains, but Greek workmen from Constantinople had great influence with them, with the result that the style is distinguished by more variety than any other. The round and the pointed arch, the Byzantine dome, the quadripartite vault, the Arabian minaret, towers square, hexagonal and circular, the mosque, the basilica and the temple, were all mingled with boldness and disregard of convention, but with a result that justified the daring. As Grüner says, "The influence of Byzantine art is clearly perceptible in the variety of colour which is employed, yellow and white and

red and green and black tiles and bricks being used alternately with the utmost skill and the greatest variety of effect."

And now for my suggestion. It is in few words that in face of the present atrophy of British architecture we should go and do likewise, adopting eclecticism in the same spirit as the great art nations above referred to, who, having found a suitable basis to work upon, created national architectural styles answering all their social requirements for centuries. Why should modern English architects be longer satisfied to go on copying, with antiquarian exactness and zeal, structures which are themselves debased imitations of Renaissance buildings, when noble ancient edifices exist in their own dominions only awaiting their application of the eclectic spirit to reward them with the honour, glory and substantial rewards for establishing a new national style of architecture characteristic of their country's world-wide realm?

Considering that the population of India is ten times that of Great Britain, that thousands of Englishmen now visit the country every year, what, Sir, should appear more natural than for Oriental domes and minarets, with their beautiful tracery and variety of everlasting colour decoration, to make their appearance on the horizon of this metropolis of the modern rulers of the great peninsula? A living architect, indeed, has proved that the style can be applied satisfactorily to modern requirements.

HERMES.

Shoreditch Technical Exhibition

SIR,—The Shoreditch Vestry have just established a municipal technical trade school for the woodwork industries, in which 16,000 artisans are engaged in the parish. The school is the first municipal one of the kind in London, and to mark the opening of it an exhibition of antique wood-carving and furniture, with carefully-selected examples of the best modern work of the locality, has been arranged to be held in the Shoreditch Town Hall from May 5 to 13, and to be opened by the Lord Mayor of London, the president of the school.

The antique work will be arranged in historical sequence and explained to groups of visitors by expert demonstrators, so as to make it of educational and artistic value to artisans. Several leading connoisseurs have already promised loans, but to make this section of historical value a large variety of examples of different periods and styles is required. As this is the first exhibition ever held in Shoreditch, whose artisans are practically shut out from the art treasure houses of the West End, will you allow me through your columns to appeal to generous collectors of old carving and furniture to lend a few exhibits for this exhibition, which is intended solely for the artistic education of workers in the wood industries? The fact that some of the technical classes are already in a fortnight filled up shows, I think, that the apprentices and artisans here are alive to the value of technical education, and that they will fully appreciate an artistic exhibition in their midst.—I am, Sir, your obedient servant,

H. MANSFIELD ROBINSON, Hon. Sec. to the Exhibition.

Competition Trickery.

SIR,—Seeing in one of the professional journals an intimation of hospitals being required by the Lanark County Council, we wrote the secretary asking "full particulars," and received some in a few days, but not finding therein any reference to the employment of the successful competitor, we wrote again and put the following plain question: "Will the first-prize man, if known, be appointed architect for the hospitals on the usual English terms?" and received the following reply: "In all probability, if the successful competitor is a capable man, he will be entrusted to carry out the work," which coming, as we thought, from gentlemen of a county council, who would not descend to the giving of a mere tricky reply to so plain a question, we prepared plans on the understanding thus given. In due time we forwarded plans of one hospital to cost 20,000*l.* to 30,000*l.*, and another of smaller size, and were informed officially that we had taken first premium for the large and the second for the smaller hospital, but coupled with this intimation came the extraordinary question as to whether we would undertake all the duties required, plans, specifications, quantities, measuring-up, attendance on committee, &c., for 3 per cent., on which we at once called attention to the plain question and answer sent us prior to the competition and asked an interview.

Instead of an interview, the clerk sent us a printed document headed "To Architects," in which it was stipulated that the premiated plans became the property of the committee, but which document being withheld from us when we wrote for full particulars, and not seen by us until after our plans had been actually accepted, could not with any fairness be considered as binding upon us, and we again asked an interview with the committee, offering also as a compromise to accept the terms recognised in the neighbouring city of Glasgow, although unknown to us. Finally we were asked to meet the committee, and on

Good Friday, of all other days, did so, but only to find that whilst they disagreed amongst themselves as to what the 3 per cent. was to include, its acceptance at all cost was determined upon, and instead of allowing us to read the correspondence (which was but short), and take up the points *seriatim*, we were met by cries of "Yes or No," "We can't sit here all day," and such like; when, seeing the difficulty of getting arguments considered at such a meeting, we promised, in the light of the information then given us, to reconsider the matter and write again in a few days, but from a letter sent us bearing the same date it is evident they no sooner got our backs turned than they passed a resolution withdrawing even the 3 per cent. offered, and a cheque has been sent us for the premiums, showing the intention to keep our drawings and leave us with a paltry 70*l.* instead of the employment we were led to expect on English terms, which would have brought us some 1,500*l.* or thereabout.

Such is the treatment meted out by a county council to an old-established firm of architects, who only competed after careful inquiry as to terms, and whose only fault is that they believed they reply to their queries to be such as gentlemen of a county council would be expected to give and not the mere evasion it has turned out, and to be taken advantage of when opportunity served.

With this publicity we leave the matter for the present, and much mistake our fellow-architects and the journals which so ably represent our profession if such a disreputable transaction is allowed to pass without the most indignant protests.

Yours &c.,

C. O. ELLISON & SON.

Liverpool.

GENERAL.

Excavations are in progress in the caves at Lavant, Chichester, under the direction of Mr. C. Dawson, F.G.S., and Mr. G. Lewis, C.E., and it is expected that the results will add to the knowledge of prehistoric life.

A Chapel of Ease is to be erected in Worthing at a cost of 3,230*l.*

The Brighton Town Council are negotiating for the purchase of property in the rear of the School of Science and Art to obtain a site for the contemplated technical school.

A Board School is about to be erected at Polegate, Hailsham, Sussex, according to plans by Mr. Mitchell, architect.

Mr. W. S. Braithwaite has been appointed architect to the Leeds School Board at a salary at the rate of 200*l.* per annum, with permission to take private practice, the engagement to be terminable by three months' notice on either side.

The Earl of Carlisle has presented to Tullie House, Carlisle, a replica of the bas-relief of the battle of Flodden Field, by Mr. E. Burne-Jones and the late Sir Edgar Boehm.

Mr. R. H. Carpenter, who so faithfully adhered to the practice of his father, the late R. C. Carpenter, in church work, died on Wednesday in his fifty-second year.

The Aberdeen University Court have received a letter from Mr. Charles Mitchell, of the Elswick Works, Newcastle, announcing a further donation of 7,000*l.* towards the extension and improvement of the Marischal College. The total of Mr. Mitchell's donations now amounts to 20,000*l.*

The Governors of Dulwich College have arranged that the Dulwich Picture Gallery will be open on Sunday afternoons from two o'clock to five during the summer months.

The Edinburgh Architectural Association will tomorrow pay a visit to Leuchars Church, and after that will inspect Earlsall.

The Dundee Institute of Architecture met on Thursday evening, the 20th inst., when Mr. Frank W. Young gave a lecture on "The Influence of Minute Quantities of Impurities on the Properties of some of the Useful Metals."

Mr. Lewis F. Day will on Monday evening, the 24th inst., deliver the third of the series of Cantor lectures on "Some Masters of Ornament," in which he will treat of the latter Renaissance.

The Surveyors' Institution meets on Monday, the 24th inst., when the adjourned discussion on the paper, read by Mr. T. Bright at the last meeting, on "Underwoods, their Growth and Utilisation," will be resumed; and, time permitting, a paper will be read by Mr. R. F. Grantham on "Recent Experience in Sewage Filtration considered in relation to River Pollution."

The Annual Dinner of the Surveyors' Institution will take place at the Holborn Restaurant (Venetian Room) on Wednesday, May 31, at half-past six o'clock, instead of the day previously announced.

London and Lancashire Fire Insurance Company.—The directors announce that they propose to pay the same dividend as for last year, viz. 7*s.* per share, free of income-tax, which, with the interim dividend of 3*s.* already paid, makes a total of 10*s.* per share, or 20 per cent. on the paid-up capital, thus absorbing 42,550*l.*

The Architect.

THE WEEK.

ALTHOUGH a manager of Drury Lane Theatre discovered by experience that "SHAKESPEARE" might be taken as meaning bankruptcy, there can be no doubt that the poet's name is every year becoming of more significance to the world. When it is found that for the year ending March 31 no less than 23,966 people went on a pilgrimage to the poet's house in Stratford-on-Avon, and that only about one-half, or 12,381, were Britons, is it not plain that the plays are more and more esteemed as a part of what the Germans call "Weltliteratur"? Ten years ago it was considered remarkable that 12,400 people visited the house in New Place. The figures may now represent the number of foreign pilgrims. The extent to which the whole world becomes kin by the poet's touches is evident when we find that two votaries of SHAKESPEARE came to Stratford-on-Avon from Arabia, nine from Turkey, ten from Ceylon, and five from Japan. It was fortunate for the town that the Yankee showman was not able to carry off the old house, and put wheels under it in order that it might be hawked from State to State in America.

ACCORDING to the agreement just entered into with the Chichester City Council, Mr. BALDWIN LATHAM, C.E., is to receive a commission of 5 per cent. upon the estimated cost of the drainage works (exclusive of the cost of land) set forth in his estimate of November last, and a like commission upon any supplementary expenditure which may be sanctioned. In addition, he will be paid 310% for his charges and expenses in carrying out tidal observations, 145% for surveying work, 50% for Parliamentary work in connection with the preparation and lithographing of plans, &c., and 100% in respect of his time and expenses in attending Government inquiries. Mr. LATHAM may by himself, or by the appointment of a qualified quantity surveyor, or conjointly with a qualified quantity surveyor, in addition to his other remuneration, receive the usual commission of 1½ per cent. from the contractors for the supply of quantities, together with the cost of printing same, and other documents required for the purpose of entering into a contract. The commission will include travelling and other incidental expenses. As to the time of payment of commission, the agreement stipulates that one-half the said commission of 5 per cent. is to be paid to Mr. LATHAM within two months of the sanction being given to the works by the Local Government Board, or the money can be borrowed for execution of works, and in case the works are so sanctioned and the Corporation proceed to carry out the same, then the remaining half of such commission of 5 per cent. shall become due and payable to Mr. LATHAM each month as the works proceed on the amount certified by him to be due to the contractors, and the final balance shall be paid within three months after the works have been completed and handed over to the Corporation, and after the contractor's period of maintenance shall have expired. In the event of the sanction of the Local Government Board not being obtained to Mr. LATHAM's present scheme and another scheme being prepared, then he shall be paid half of the first instalment of 2½ per cent. (namely, 1¼ per cent.) in addition to the sums due to him; and in the event of no further scheme being sanctioned within two years from the date hereof, then a further commission of 1¼ per cent. shall be accepted by the engineer in full satisfaction for his services of every description, and shall be paid within six months after the expiration of the two years. Mr. BALDWIN LATHAM has been asked to furnish the plans, estimates, &c., with as little delay as possible, as it is desired to obtain the sanction of the Local Government Board and to commence operations.

THE London School Board lately attempted to act unfairly towards their quantity surveyors. About a month ago it was resolved, "That in future the provisional sums included in the contracts for new schools, enlargements, &c., be calculated by the architect instead of by the quan-

tity surveyors; that a separate amount for the provisions be specified in the resolution of the Board for the acceptance of the tender, and that the quantity surveyors' commission be calculated on the amount of the tender exclusive of the provisions." It should be remembered that recently the Board obtained tenders from the surveyors which were below the ordinary percentage, as it was understood that allowance should be made on provisions. The surveyors therefore remonstrated. They said:—"In face of the agreement entered into between the Board and ourselves, we submit that no alteration in the terms of the agreement should be made by either party thereto without previous consultation and arrangement. The resolution materially alters the conditions under which the surveyors nominated by your Board contracted to prepare quantities, by taking the provisional sums out of the contract, and thereby depriving the surveyors of their commission upon the most profitable part of their work. The terms of the contract between the Board and ourselves, even before this alteration, were such as to leave only a bare remuneration for professional services." There could be no escape from the argument of the surveyors, and it is therefore proposed to rescind a resolution which undoubtedly was a piece of sharp practice unworthy of a public body, although introduced as an economical stroke.

A REPORT has been presented to the Secretary of State for War by the Council of the Society of Antiquaries of Scotland respecting the condition of Stirling Castle. The parts noticed are the old hall, the royal lodging or palace and the chapel. The hall is said to have been erected by JAMES III., and is 125 feet long by 36 feet wide. It corresponds in general plan with English halls of the same period. It has an oriel or projecting window on the east and west sides of the south end of the hall, and the remains of the stone vaulting are still to be seen. The old roof was removed in 1797, when the whole building was cut up into barrack-rooms, and every architectural feature more or less interfered with. The conversion of this building into a barrack has brought about the destruction of much that must have been interesting. The roof of the building has been renewed, and the officers' mess is now located in it. Originally there were apartments above the state rooms. For the baptism of Prince HENRY, JAMES VI. determined to hold a great function, and Stirling was decided on as the proper place for it. As the existing chapel was too small and ruinous, he caused it to be razed to the ground and a new chapel erected, which is the one now existing. Parliament granted 100,000% Scots for the work, and it was built by a great body of skilled workmen, King JAMES superintending its progress. The ceiling and walls were richly decorated with painting and sculpture. The walls and architectural features are quite entire, but the roof is modern. It is now divided up and used as a storehouse. There is evidently a vault below it, or at least the east end of it. The ground falls rapidly from west to east, and a built-up door exists in the east gable. What most impressed the committee, after an examination of these buildings, was the ruthless manner in which they had been treated to suit temporary purposes, in utter disregard of their historical or architectural interest, and the trumpery character of the new work. Yet they are not so far destroyed but that they might be restored to something of their former condition, were the military authorities willing to give up using them. Mr. CAMPBELL BANNERMAN has informed the Council that with the aid of military advisers he has come to the conclusion that any disfigurement which may have been perpetrated, for the most part at a remote time, cannot be corrected without such changes as would modernise the buildings according to the fancy of some living architect. It is thought better, therefore, to leave them alone, care being taken to keep the exteriors, and especially the decorative work, in good repair, to guard, as far as possible, against decay, and when repairs are executed, to see that they are in the hands of some competent person. The Secretary of State for War is not prepared to go further, as a diversion of the buildings from their present use as barracks would involve the expenditure of a very large sum of money in re-providing accommodation for the garrison elsewhere, apart from the expenses of restoration.

ARCHITECTURE AT THE ROYAL ACADEMY.

THE exhibition of the Royal Academy, which opens on Monday, will not be disappointing to visitors. Among the paintings and sculpture are more pleasing works than were visible last year. The few who will be adventurous enough to invade the solitude of the Architectural Room can also find there very much which will afford enjoyment. This year some consideration has been shown for amateurs. In the majority of cases where several drawings by one architect or firm are accepted they are hung together, and hence it is possible for the public to discover that there is less monotony in treatment than many suppose. Designs by various architects for the same work, such as the South Kensington Museum, the Glasgow Art Galleries, the Oxford Town Hall, &c., can also be contrasted from their positions, and in that way something is done to diminish the difficulties which oppress so many of the public when they attempt to realise the value of modern architecture. Whether the care taken in the arrangement will be appreciated remains to be seen.

Many of the architects whose designs were declined will be sure to cast longing eyes on the blank space that is visible. On the principal wall there are on an average not more than three rows of drawings. It is a convenience to the few who are bound to study the contents of the room when drawings are not hung up to the cornice, but architects, as a rule, are satisfied to have gained admission for their drawings, and are less anxious about the positions in which they appear. The large designs for decoration which are shown in the room will probably be more acceptable to the public than the views of buildings, but no doubt there will be some grumbling about the space assigned to them.

As in recent exhibitions, the absence of public or governmental works is enough to amaze a foreigner, and forms one of the peculiarities of the room to those who have seen the architectural displays of the Continent. The nearest approach to a work of the class is perhaps the Imperial Institute. Mr. COLLCUTT contributes a view of the staircase, in which he proves that it is possible to avoid monotony and to produce an effective whole by depending solely on architectural details, without aid from the sculptor. Competitions follow so fast in this country, the three designs for the completion of the South Kensington Museum by Mr. EMERSON, Mr. T. MANLY DEANE and Mr. W. YOUNG, may appear to architects like ancient history. But they are worth the attention of the public, for they will suggest the risks which attend Government work in this country. It may not be generally known that the preparation of these and other designs was wasted labour, since there was no money available for the work. The cause is commonly attributed to the change of Government, but in reality it arose out of departmental jealousy.

If State works are absent we see enough evidence of what can be done by municipalities. There are three of the five premiated designs for the Oxford Town Hall. It is not difficult to perceive that in the contest between Mr. HARE and Mr. RÜNTZ, the latter must have suffered through his efforts after originality. At first sight there is less symmetry apparent in the second design, and it would be supposed that in consequence there would be less economy of execution. In both there is surface ornamentation, but in the accepted design it is commonplace, and therefore no doubt it was held to be cheaper. The two designs are worth the consideration of young competitors, because they denote how valuable is tact when dealing with municipalities. Messrs. CHESTON & PERKINS's design was probably considered to want solidity from the extent of the fenestration. The design for the County Council House, Stafford, by Mr. W. A. PITE, appears to be too quiet an example of eighteenth-century style to satisfy local rulers. Mr. E. W. MOUNTFORD sends the south-west angle of his Sheffield Town Hall; but as the uninitiated cannot judge of fragments it is likely to be said that, in the building, chimneys and gables are in excess. In the Battersea Town Hall Mr. MOUNTFORD has ably treated a difficult site. The principal front, with its rusticated quoins, capacious semicircular porch and round-headed windows, is stately and substantial, while the side (which stands on an incline), with its ingenious buttresses and massing of the

parts, may be said to be picturesque. The design for Edinburgh Municipal Buildings, by Mr. STATHAM, was also for a site that was not level, and the author's aim was apparently to suggest that the municipal offices would be a guardian fortress for the Old Town and the New. Mr. W. HARRISON's first premiated design for St. Pancras Municipal Buildings shows a building that has dignity and no trace of the fussiness which so often marks competitive work. There is a good porch, a range of round-headed windows on ground floor, a second storey that might be taken as mezzanine, and a third with large square-headed windows, which is evidently the most important. The whole is well combined, and there is nothing to which economical reformers in the parish can take objection. Mr. W. M. FAWCETT's Cambridge Guildhall is also of the cubical block type, but more Classic in expression. The first storey is adorned with pilasters, and they do not appear out of place by contrast with any of the other parts. Messrs. BRADSHAW & GASS have selected English Renaissance for the Town Hall and Offices, Farnworth, and have treated it effectively. The Police Offices, Birmingham, by Messrs. A. WEBB & INGRESS BELL, is a very important example of a public building for a town in which it was requisite to be sparing of expense. The proportions being satisfactory the severity does not appear misplaced. If the Victoria Courts could also be shown the value of the work would be heightened by contrast. Mr. C. F. HAYWARD's Local Offices and Fire Station at Harrow is rather small in scale, and the necessity of having a fire-bell is turned to good account, as it gives opportunity for the introduction of some telling wrought-iron work; but the real crux of such a building is evaded, since there is no provision for sheltering a fire-escape. The fine drawing of FORMENTONE's Town Hall, in Brescia, by Mr. J. C. WATT (this year there are very few examples of ancient work) should not be overlooked in examining the municipal buildings.

The importance which is attached to provision for education is apparent. The Municipal Technical School, Manchester, by Messrs. SPALDING & CROSS, may well be described as palatial. The departments are indicated, the size of the windows will enable any light that forces its way through the smoke to be used, and the numerous gables will enable the building to assert itself on dull days. It is creditable to Manchester to erect such a building, and yet the outlay is a wise investment. The Northampton Technical School, Clerkenwell, is the subject of designs by Messrs. ROGER SMITH & SON, who believe in the virtues of capacious windows. Mr. E. W. MOUNTFORD, in his design for the same building, introduces much variety of grouping as in his other works. His St. Olave's Grammar School is a good example of its class. In the Leeds School of Medicine Mr. W. H. THORP was apparently desirous to impart a sort of domestic character to the building, which would gratify students, and to suggest the professorate by a tower. The combination is more agreeable than would be afforded by a severe Classic style. The Glasgow Art Galleries may be included with the educational buildings. The accepted design by Messrs. SIMPSON & ALLEN will explain the controversy that arose in the north when it was accepted. The amount of ornamentation in statuary and relief, and the variety of the parts, at the first glance suggest a costly design, but the effect is undoubtedly attractive, and if the building can be carried out as here represented it will look well on the site. Messrs. MORRIS & HUNTER adopted a more severe treatment, but one that is not uncited to Glasgow. There is more power of composition in Mr. T. MANLY DEANE's design, which should discredit those who maintain that only Scotsmen can manipulate northern details; but probably it was considered too massive for a building that was to be a resort for pleasure-seekers. In his new British Gallery, Millbank, Mr. S. R. J. SMITH, we suppose, wished to suggest a relationship between the building and the National Gallery. There was not much difficulty in surpassing the obnoxious "pepper castors" by transforming them into graceful domes. The style adopted is Classic, and visitors will be grateful when they find that so large a part of the galleries consists of only one floor, which will be lighted from above. Mr. KOCH has a Board school at Gais, Switzerland, which somewhat resembles the ordinary London Board school, with the exception that the windows

are smaller, and there is consequently more solidity. The Public Library, Colchester, by Mr. B. BINYON, is of red brick, with a very large window in the middle. Mr. J. M. BRYDON'S Village Hall, Forest Row, is of the cottage type. The School of Needlework, South Kensington, by Mr. FAIRFAX WADE, is so quiet as to be remarkable amidst so much that is pretentious in the region.

(To be continued.)

MUNICH.

BY A CORRESPONDENT.

IT will commonly be found that visitors to Munich, especially English visitors, display more or less uncertainty when they are criticising the city. They treat it as a sort of puzzle. Most of the greater towns of Germany are sure to surprise the stranger, for where he expected antiquity he is likely to find an imitation of something that was to be found in Paris not earlier than the eighteenth century. The princes who went to pay their respects to LOUIS XIV., if they did not bring back French gold or a promise of it, carried home a belief that to become every inch a king it was necessary to dwell in a building that was an imitation of Versailles. Reverential subjects imitated their highnesses on a becoming scale. Now in Munich one sees evidence enough of the influence of France on the buildings; but that is not all. You have exotics of many other sorts. If you are disposed to dream as you perambulate streets at home or abroad you may in Munich be suddenly transported to Florence, and you will scarcely have discovered you are the victim of an illusion, and that you are standing in the Bavarian capital, than you are likely to imagine, after taking a few steps, that you must be in Rome or Milan, in Athens or Ravenna. You have spent, say, an hour in the Basilica of St. Boniface, and may be endeavouring to determine for yourself, after seeing an artisan's marriage in it or a christening, whether a costly copy of St. Paul-without-the-Walls is an ideal modern church, when you find yourself in front of the neighbouring national Palace of Glass. Here, at least, Munich designers should be free; but if you are unable to recall the exhibition building which served as the prototype, you are convinced that you have seen engravings of it years ago. Then the notion, in spite of its absurdity, may arise within you that Munich is only a scattered Sydenham, or that Sydenham is a compressed Munich.

While one is in so hesitating a mood it is astonishing how interesting will become the comparatively few buildings that have survived the mutations of kingly and electoral taste in Munich. The Frauen-Kirche dates only from 1468, and is therefore not of the purest type of Gothic. An English critic in the early part of the century condemned the exterior as "frightful in the extreme," and in the interior the air and dust of four centuries appear to have been preserved. But after a general survey of the streets of Munich the student of architecture will find that he prefers to go round and round the church to while away time rather than to renew acquaintance with what is outside. He may have admired the cast of the monument of LOUIS IV. in London, but in the Frauen-Kirche it assumes a new interest because it is genuine. In any other city the church of St. Cajetan would be condemned as an example of the ultra Rococo; in Munich there is relief in the extravagances, because they appear more human in their fallibility than the chilling correctness which is visible in so many of this century's buildings.

A judge of the MATTHEW ARNOLD type would, however, find much to gratify him in Munich, for if the function of criticism is to rule all things, to hold sway especially over all men who claim to be artists, there is no doubt it has had a better opportunity to show its strength in the Bavarian capital than in any other city, ancient or modern. There is scarcely a street which does not present something to testify how inferior is the individual artist if valued beside some formulation of a principle. The critical spirit had demonstrated about sixty years ago what was proper to be done in the way of building, and ever since the architects have been trying to realise the discoveries which the æstheticians had drawn out of their studies as amateurs.

Fate was undoubtedly favourable to all those in Munich who had faith in "the bookish theoretic." In 1825 LOUIS, who

was the second king of Bavaria, reached the throne. He was an enthusiast for whatever was Greek, even in name, and for a long time he was a yearly visitor to Athens. In 1829 he published a volume of verses, but he had not much belief in the inspiration of his contemporaries. He considered his subjects would be better employed in imitation of ancient works than in setting up freaks of their own, and in order to convince them he decided that Munich should exemplify what His Majesty considered was the best work that had been produced by Greek, Roman, Mediæval and Renaissance hands. If LOUIS were as strong as NAPOLEON, who was the creator of the kingdom of Bavaria, he would have carried off every stone of the buildings he admired, and have set them up again triumphantly in his capital. The King's limitations, however, became a source of new pleasure. LOUIS was able not only to erect imitations of the buildings he admired, and as they appeared when most perfect, but he could also have them adorned with paintings and sculpture that would gratify his own inclinations, and correspond with the theories of the Court philosophers. In that way Munich would present an appearance still more unlike what was to be seen in Nuremberg or Innsbruck, and more becoming the capital of so important a kingdom. The king's family are still visionaries, and LOUIS may have imagined that he was doing much to make his country a connecting-link with Italy, Rome and Greece in the chain of civilisation. One of his unhappy successors, it is well known, wished to renew the connection with the France of the Willkürregiment that had passed away with the POMPADOURS and DU BARRYS, as well as with the far more remote mythic period of the Wagnerian "Gottterdammerung;" but, failing, he sought relief under the waters which he loved to traverse as the Knight of the Swan. Apparently it was not believed at Court that Bavaria could stand alone or work out an independent destiny.

King LOUIS could not have discovered a more suitable architect than LEO VON KLENZE. He had mastered Classic and Renaissance styles, and he was willing to evince his reverence for them by combining them in a manner that would be considered illegal if ordered by an inferior architect. He began with the Königsbau, which would recall the Pitti of Florence if it were not for the Doric entablature of the lower storey and the Corinthian and Roman pilasters in the upper storeys. The palace seems absurdly strong for a city in which the inhabitants are loyal. In the interior the architect meekly sacrificed a reputation for planning in order that ample room and verge enough should be provided for the series of paintings by SCHNORR, KAULBACH, ZIMMERMANN, friezes by SCHWANTHALER, and other decorations. The pictorial work is undoubtedly remarkable. No artist could work on so large a scale and so correctly who had not mastered all the knowledge that was attainable in a German academy. But as often happens with learned artists, the draughtsmanship is superior to the colouring. In spite of what GOETHE had written in his "Farbenlehre" (and the English scientists who profess to have demolished his conclusions would do well to remember that during forty years Professor HELMHOLTZ championed them), it was not possible sixty years ago to convince German artists of the importance of the relation between colour and form. They were taught so much about figure, how "der Künstler gibt Bilder" and "Bilder nehmen die Sinne auf," and so on, they concluded that mental images were comparable to cartoons in black chalk, which might vary in definiteness and beauty, but were colourless, because colour was unnecessary to their significance and appreciation. To people who were brought up on German metaphysics, the paintings of subjects derived from the "Iliad," the Greek tragedians, the histories of CHARLEMAGNE, BARBAROSSA and RODOLPH of Hapsburg, which are seen on the walls of the Königsbau, would not be made more expressive if a second TITIAN had executed the colouring. They were accepted as examples of the ideal as far as it could be depicted; the compositions were considered, as it were, by the mind's eye of every onlooker, and in that way they were deemed to be satisfactory. Critics whose eyes had grown dim by poring over books, and to whom most things seemed of the colour of printed paper, realised the intentions of the artists, and were indifferent to short-

comings of execution which to a colour-grinder in a Renaissance workshop would appear ridiculous.

It would be unjust for any one to judge of the experiments in painting by the appearance which the pictures present to-day. Time has not dealt more tenderly with the Munich frescoes than with those which are to be seen at Westminster. The external work has suffered, and the writer must admit that he prefers SMIRKE'S Post Office or even WILLIAMS'S at St. Martin's-le-Grand to the Postgebäude in Munich, which forms part of a group with the palace and opera house. Although its polychrome decorations must have been ambitious, they have now as used-up an appearance as if they belonged to the halls of dazzling light in some broken-down Cremorne. Elsewhere in the city the colour work is not more persuasive—at least to English eyes—than the crude plates which are produced for the benefit of students in treatises on polychromy. There is, or rather was, in the Munich paintings a comprehension of the law of contrasts, and the colours are rightly chosen for the positions in which they are laid; law, in fact, is supreme everywhere, and probably nothing was done without a precedent whose existence is duly recorded in an official report, but the difficulty is to find anything which denotes that the painters possessed feelings and were not afraid of experiments which would give them pleasure. Is it disappointment with so much of the coloured architecture in the streets which makes so many of the paintings in the Pinakothek appear almost fascinating? A visitor who sees many galleries may grow sceptical about RUBENS'S power as a colourist, but in Munich he becomes almost refreshing, and one is indifferent whether the numerous dozens of pictures which bear his name contain any of his handiwork. They have at least his characteristic effects, and one's gratitude is excited. Another example may be allowed. PIOTY is prone to exaggeration in his colour experiments, but go straight to his picture, after a contemplation of the frescoes outside the galleries, and you are likely to say the artist must be a man of genius. May it not be said that the important sculptures in the Glyptothek hardly seem to convince every visitor that they once adorned temples and public places in Greece? It is difficult for a moment to resist the misgiving that they also were reproduced, restored or in some way manipulated according to the canons of the local professors.

If those canons were attempts to get at the essence of things they might be excused, as well as any artists who accepted them because they helped to impart consistency to work. But in Munich the initiative for all the speculations about art and the buildings which were raised were derived from the fads of King LOUIS. He believed he had discovered the noblest works, and too many able men were ready to aid in demonstrating the infallibility of the royal perception. It would be absurd for anybody to suppose that it was not possible to excel the work done by machines at any time, and yet it is taken for granted that the human machine declines in power after it has attained some efficiency. Munich presents so much evidence of the latter assumption as to become depressing to everyone who believes that art is not outside the influence of the law of progress. The disappointment which is felt at seeing how valueless are the efforts which once were made to resist that law is, however, a good sign, for it is an expression of a belief that political power should never be allowed to control an art.

EGYPTIAN EXPLORATION.

IN a communication to the *Manchester Guardian* Mr. W. St. C. Boscawen writes:—

In the hills of the Gebel-el-Gebrai, which derive their names from the small Coptic village of Dier-el-Gebrai in the plain, there are a number of tombs of officials who lived during the reign of the Pharaoh Nefor-Ka-Ra-Pepi, or Pepi II., and who were governors of the Nome of Tuf Antaeopolis, and also priests of the pyramid of the king. This office of priest of the pyramid or pyramid temple is one of the oldest in the hierarchy of Egypt. In the tombs at Sheik Said we find the burial-place of a man who was priest of the pyramids of Kufu and Usorkauf, of the Fourth and Fifth Dynasties, and in the museum of Gizeh there is the inscription of an official, Tepe-Ankh, who was priest of six pyramids, including those of Kufu, Kephren and Menkara, and the still older pyramid of Senefru

at Medum. The discovery of these tombs is of special interest as the pyramid of Pepi II. is still unknown. That of Ra-mori Pepi I. was opened at Sakkarah in 1880, but no indication has been afforded as to the site of that of Pepi II. until the discovery of these tombs. Here the name of the pyramid is given as Men-Ankh, "the Support of Life." During the last few months many records of Pepi have been found in this district and in the neighbourhood of Mer, on the west bank of the Nile, where some very fine tombs have recently been opened by the authorities of the Gizeh Museum. In the neighbourhood of Namir, opposite Manfalut, on the borders of the Lybian desert, there are the remains of a pyramid which it is now supposed may be possibly that of Pepi II. The early part of the Sixth Dynasty, about B.C. 3200, was one of the most prosperous periods of the early Egyptian empire and the tombs here amply prove this. The paintings in the tombs, though considerably damaged by the Copts, are among the best in Egypt, and furnish us with almost every detail of the domestic life of the people. The best tomb is that of Jau, whose name and titles are found in an inscription which reads as follows:—

Priest of the pyramid of Nefor-Ka-Ra (Men-Ankh), the Support of Life, Great Chief of the West, Ha Prince, Royal Chancellor, familiar friend of the King; Lector, Superintendent of the South, Great Chief of the Antaeopolite Nome; the devoted one towards the great god the Lord of Heaven, the veteran Jau.

The inscription is beautifully drawn, and is painted in green upon a red ground. The walls of the tomb are covered with paintings representing harvest scenes, fishing scenes, and the usual vocations of the deceased. One of the most lively scenes here is that which represents the dancers who danced at the *Ka* festivals. The girls are perfectly nude, and have their hair done in long plaits which hang down the back. To the end of this plait a ball or inflated bladder is tied, and part of the dance seems to consist in kicking the bladders on each other's heads. On another wall a number of ships are represented, including the funeral bark of the deceased, which exactly resembles the small models of boats so often found in the tombs.

Close to the tomb of Jau is a smaller tomb, terribly mutilated by the Copts, but containing some of the most important paintings that have yet been found. Here we have on the walls a complete series of little tableaux representing every trade, profession or domestic service known in Egypt, and, what is more important, every group is accompanied by a hieroglyphic inscription giving the explanation of the picture. We learn from this remarkable painting not only the different trades but the names of the trades, and in many cases the names of the different processes in the work. Here we see the sculptor cutting out of stone the funeral or *Ka* statue of the deceased; in another group the painter painting it; the wood carver makes the coffin and paints it, and smaller wooden statues; while another carves the staff of divine strength to place in the hand. In another group the carpenters make furniture; cabinets, chairs, tables are being neatly made and polished. The most interesting series of pictures are those illustrating the working of gold. We see the whole process: washing the alluvial in a cloth cradle, gathering the dust, melting it with the blow-pipe, casting into ingots and weighing the final result—each of these processes is most fully described, and the whole forms one of the earliest chapters in the history of mining. So also every process of ship and boat-building is figured and described. For domestic service there are scenes illustrating the work of the baker, butcher, butler, the weaver and many other domestic occupations. The official in whose tomb these paintings were found is named Apa; he was also a governor of the Nome and a magistrate, and upon these walls his judicial functions are recorded. A crime has been committed; we see the police in search of the criminal and arresting him by seizing him by the head. He is brought before the judge, and we next see him being bastinadoed. These tombs are now being copied by the members of the Archaeological Survey of Egypt, under Mr. Newberry, and their publication will add much to our knowledge of the life of Egypt in the thirty-third century before our era.

In another letter Mr. Boscawen says:—

On the east bank of the Nile, about 170 miles from Cairo, there rise almost perpendicularly from the narrow fringe of verdure a row of limestone cliffs, perforated with openings, the entrances of tombs. The line of hills is known as the Gebel-beni-Hassan, and is the site of the necropolis of the ancient city of Menat Khufu, the "nursing city of King Cheops," the builder of the Great Pyramid. It is difficult to explain exactly the meaning of this title, the "nursing city of Khufu," but it seems to have been one confined to the days of the early empire, as it is also found in the name "Menat Senefru," the "nursing town of Senefru," found by Dr. Flinders Petrie in one of the tombs near the pyramid of Senefru at Medum. Although the town of Menat Khufu belonged to the pyramid age, the tombs here do not represent burials of that period, but of the later age of the Twelfth Dynasty: that is, about twelve

centuries later. They belong, indeed, to the most important and glorious period of the Egyptian empire, when the pure Egyptian civilisation, uninfluenced by foreign intercourse, had reached its highest development. There are in the hill thirty-nine tombs arranged in two groups, and of these twelve are inscribed and painted. The inscriptions in the large tombs, especially that of Khnumhotep II., give us a wonderful insight into the life and social customs of the age, which are still further illustrated by the beautiful paintings with which the walls are adorned. In some of the tombs dates occur, and thus we are able to fix with accuracy the period when they were executed. They range between the age of Amenemhat I. and Usertesen II., of the Twelfth Dynasty, and therefore about B.C. 2400-2300, one of the most interesting periods in Oriental history.

To the ancient Egyptian the making of his tomb, or "eternal house," was the great duty of his life, and hence the magnificence of many of the tombs here. The truth of this is confirmed by the following passage in the inscription of Khnumhotep, who places clearly before us the reason for building his tomb:—"My first honour," he says, "was in establishing for myself a tomb-chapel. For a man should imitate the acts of his father. Now, my father made for himself a *Ka* house in the city of Mernefer, of good limestone, that he might establish his name to eternity." He also gives us another reason for the construction of this tomb, which throws much light upon the feudal character of the life of the time:—"He made this tomb as his monument, that it might establish his name to eternity and make it endure for ever;" and then he says, "that he might establish the name of his staff, arranged according to their rank, his household officers, whom he promoted from being serfs." This association of master and servant in life and death is a curious characteristic of the life of the early Egyptian empire, and is no doubt a survival of the older custom, when the slaves were slain at their master's tomb to accompany him and tend him on his long journey. It will be seen at once how important this custom is in restoring to us the life of the period. Not only do we obtain the names and titles of the deceased from their tombs, but also the names of their wives, sons, daughters and servants, from the highest steward of the household down to the donkey-boy. And when we bear in mind that each of these names accompanies a portrait, we have an increased insight into the life and surroundings of the deceased.

The feudal character of the age is still further borne out by the statements of the duties of a governor found in the tomb of Amenai, or Amenemha, who, after a period of office of twenty-five years, died in the forty-third year of the reign of Usertesen I. "I cultivated," he says, "the entire nome (Oryx-mone) with many workpeople. I troubled no child, I oppressed no widow, neither did I keep a fisherman from his fishing, or a herdsman from his herd. There was no head of a village whose people I had taken away for compulsory labour (*corvée*), and there was no one unhappy in my days or hungry in my times. When a famine arose I tilled all the fields in the nome, from its south to its northern boundary, and gave nourishment and life to its inhabitants. To the widow I allowed as much as to the wife of a man. When the Nile rose again and everything flourished, fields, trees and all things, I cut off nothing from the fields." This interesting passage may be compared with the famous inscription of Baba at El Kab, which records a famine, as well as the curious record of a seven years' famine on the Stela of Sheshef of King Teser, all of which show that droughts due to low Nile did then occur, producing famine and want. In such time it was the duty of the governor of the nome, who stood *in loco parentis* to his people, to provide relief. The plans of the tombs of the princes at Beni-Hassan are mostly on the same plan, but that of Khnumhotep II. will best illustrate the architecture of the period. The entrance is by a "portico in antis." The shafts are of the Proto-Doric type, sixteen-sided and resting on circular bases. The height of the portico is about 18 feet, with a depth of 10 feet, and affords access by a doorway to a large chamber. This chamber, the guest or *Ka* chamber of the tomb, is a magnificent room, being 31 feet long by 30 feet broad and 18 feet high, the roof being supported by four massive sixteen-sided columns slightly fluted, and in the floor are the openings of two large mummy pits. Opening out of the east wall is the shrine, in which were the statues of the deceased. The chamber is about 8 feet by 10, and beautifully painted, but the statues have been quite destroyed. The main chamber, in which the guests were received on festival days, is one mass of painting, illustrating every detail of the life of the deceased and of the Egyptian life of four thousand years ago. Here we see almost every detail of the daily life, similar to those we are familiar with in the tombs of the early empire, such as the tomb of Tii at Sakkarah. Carpenters and ship-builders are at work making the sacred boat or ark to carry the body of the deceased to Abydos, to rest by the side of the tomb of Osiris, and after a time to return to his own resting-place here in his native place. Potters are making vases of beautiful

shape, and women are baking bread for the everlasting journey, whilst all the work is being inspected by the master, carried in his litter. It is impossible to describe in detail all the beauty of the work here; but here we see the great man engaged in fowling on the papyrus marshes on the banks of the Nile, a sport—together with fishing, which is also represented—of which the Egyptians were particularly fond. Here we see Khnumhotep in his boat, hunting birds and armed with a fowling-stick or boomerang. He is accompanied by his wife, the lady Kheti, who is described in the inscription above her:—"The daughter of an Ha prince, the lady of the house Kheti, his wife, his beloved one, the priestess of Hathor," while in front of the boat is the body servant or valet; Khnumhotep, holding his sandals. The beautiful part of the work is the colouring of the birds and the flowers. Here we have the ibis chasing a butterfly, cranes and other birds, while in the reeds are kingfishers, their nests being shown. Among the birds are weasels, which are frightening them from their nests. The painting of every feather, of each spot on the butterflies is most accurate, and at once suggests attention to the only art of Christian times that approaches it, namely, that of the Japanese. In Egypt, as in the far Eastern kingdom, there was an intense love of nature coupled with a great artistic skill and patience. In Egypt the artist, with his palette of seven fine colours and his brush of a frayed reed, produced these wonderful representations of nature, because of his inborn artistic skill, and like the Jap, his intense love and study of nature. The Egyptians in their simpler days, when the civilisation was not spoiled by foreign contact, were very like the people of Japan, intensely conservative, living within themselves, with a simple almost patriarchal feudal system of government—happy and childlike in their family relationships, husband, wife and children, master and servant, all being bound by a sort of friendship and, above all, an intense love of the beautiful in nature.

In this age we have the "Age of Flowers." The husband garlands his wife with flowers, and she him; guests at the feast are crowned with flowers, and the altars of the temples are heaped with brilliant blossoms. To this age belong the "Love Songs" translated by Maspero, which so closely resemble the "Song of Solomon" and the amorous poem of the "Garden of Flowers." This trait survived until a long time after, and, indeed, never died out entirely. In the Amen-am-hib at Thebis, of the Eighteenth Dynasty, we have the resting-place of one who was a great lover of flowers. Here at the banquet his wife has a green lotus-bud in her hand, and all the ladies have crowns of flowers and lotus-buds in their hands, while in another scene we have the garden of the great man represented full of flowers. Khnumhotep had his gardens, and the names of his gardeners are preserved to us, and may be those of the oldest in the world—Neferhotep, Neter-nekht and Hotep. Such are only some of the features of this beautiful tomb. For such a magnificent resting-place there must have been an artist designer, and fortunately his name is preserved to us, for at the end of this long inscription his writer says, "He who undertook the tomb the director of the works was Bakt." His name deserves to be handed down to posterity as one skilled in the fine arts. The history of the owner of this tomb is given in a long inscription of over two hundred lines of writing in beautifully painted hieroglyphics on the west wall, and reveals to us many points of interest as to the offices and their nature.

DUNDEE INSTITUTE OF ARCHITECTURE.

THE fifth ordinary meeting for the session of the Dundee Institute of Architecture, Science and Art was held last week in the Upper Hall of the Y.M.C.A. Mr. William Mackison, the president, occupied the chair. Mr. Frank W. Young, director of studies in the Technical Institute, delivered a lecture on "The Influence of Minute Quantities of Impurities on the Properties of some of the Useful Metals."

Mr. Young, after a few introductory remarks, said very small quantities of mineral matter in the tissues of plants and animals were now known to be absolutely indispensable for growth and well-being. A small percentage of water vapour in the air was all important, as preventing the rays of the sun from being in our latitude unbearably hot by day, and the earth's surface from becoming excessively cold by night. Recent researches had shown that it was the omnipresent moisture which determined a large number of chemical changes. For a number of years it had been known that dry chlorine would not bleach, and now they were told it did not, in a pure and dry state, act on a number of elements for which it ordinarily exhibited a marked affinity. Anomalous as it appeared to be, there was now very reliable evidence to prove that carbon would not burn in pure dry oxygen, nor would a mixture of pure dry carbonic oxide and oxygen explode without the presence of a little aqueous vapour, which indeed required most unusual precautions for its elimination. Should that kind of research be con-

tinued there was good reason to expect ere long a new chemistry, that of pure and dry substances, and there was good foundation for the opinion that in some important respects the properties of the pure elements would present marked contrasts with our present knowledge. But the task of removing small quantities of foreign substances was a peculiarly heavy one, and the difficulties in the way of lost traces of some of these appeared well-nigh insuperable. Pure elements occurred nowhere in nature. The ores of metals almost invariably consisted of a compound of the metal (oxide, sulphide, carbonate, as the case might be), associated with a number of foreign bodies, often making up a very considerable weight of the material. After instancing this in the case of zinc, lead and copper, Mr. Young remarked that the bodies known as cast-iron, steel and malleable iron had each of them somewhat varying proportions of carbon, silicon, phosphorus and often sulphur and manganese. Malleable iron approached most nearly to the pure condition of that metal. It was now very generally admitted that the carbon present in cast-iron was in two forms: (1) graphitic carbon, and (2) combined carbon, and that the relative amounts of these was in great measure determined by the temperature of the smelting-furnace and the conditions of cooling. As regarded the presence of silicon in iron, it had been customary to speak of it as exercising, in the case of cast-iron at any rate, an influence not greatly dissimilar to that of carbon in diminishing the melting point and hardening the metal. It had been shown that, contrary to prevalent opinion, silicon increased the tensile strength and limit of elasticity, rendering the metal quiet in the mould when cast, and on the whole exerting in suitable proportion a beneficial influence on the properties of cast-iron. The metal manganese was always present in iron and cast steel, but the part which it played had not as yet been very satisfactorily made out. It was believed to soften the metal to some extent, and to render it less fusible, while in puddling iron it appeared to assist in the removal of sulphur and silicon. Willis had shown that a certain variety of steel containing no manganese would break into pieces at the first blow of the hammer, whereas a similar ingot containing 0.8 per cent. of the metal would forge readily. The general effect of sulphur and phosphorus on iron was unfortunately too well known to smelters. Small quantities of sulphur (say from 0.3 to 0.5 per cent.) in iron tended to the production of white cast-iron, while even as small a proportion as .03 of the element would make malleable iron or mild steel brittle and unmanageable at a red heat. Phosphorus increased the fluidity and hardness of cast-iron, while its presence to the extent of 0.5 per cent. or so in wrought-iron or steel ruined these metals by rendering them distinctly brittle at low temperatures. The tenacity, at the same time, was much lessened. Cast-irons invariably contained it in greater or less proportion, and in the making of malleable iron therefrom special care was taken to eliminate that impurity. Mr. Young then proceeded to illustrate the influence of very minute quantities of impurities on gold, zinc, copper, &c., and said the effect, as a rule, was out of all proportion to the amount added. In many cases beneficial, it was often most prejudicial, and the metallurgist made every effort for the removal of the evil. Yet in the case of a number of metals so many foreign bodies were present that it was not always certain which of them, or how many, were of advantage or the reverse. Even in the case of iron the conclusions arrived at were still in some degree problematical. Hence the necessity for combined and systematic research on the part of both the skilled chemist and the mechanic.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE Edinburgh Architectural Association paid their fifth sessional visit to Leuchars Church and Earlsall, under the leadership of Mr. R. S. Lorimer. Among those present were Mr. Balfour-Paul, Lyon King-at-Arms; Professor Baldwin Brown; Mr. J. M. Gray, National Portrait Gallery, &c. Owing to the courtesy of Mr. R. W. R. Mackenzie, an opportunity was afforded the members of inspecting Earlsall, which is in many ways a unique example of a Scottish mansion of the end of the sixteenth and beginning of the seventeenth centuries. The house had for a period of over seventy years been abandoned, and was fast falling into ruins when it passed a few years ago into the hands of the present proprietor, and has since been restored under the direction of Mr. R. S. Lorimer, architect. Leuchars Church having been first examined, the party passed on to Earlsall, which lies about a mile distant, and they were there received by the proprietor, Mr. R. W. R. Mackenzie. Mr. Lorimer, in his description of the house, mentioned that the first trace to be found of the name of Earlsall was in a charter of James IV., dated March 28, 1497, whereby the king bestowed anew on Sir Alexander Bruce "the lands of Earlsall and Pruck." It was the fifth laird, Sir William, who succeeded about the year 1580, whose name was

associated with the building of Earlsall. The plan of the house, said Mr. Lorimer, is a development of what is called the L plan—that is, two buildings at right angles to each other, with the main staircase in a tower in the internal angle—and in this case there is also a large tower at the north-east corner. In continuation of the western front there is a high enclosing wall connecting the main house with some smaller buildings, the whole forming a courtyard, in which the old draw-well is placed, and enclosed on the east side by a low wall and balustrade, and this side of the courtyard opens directly into the garden. Though not large the house contains several notable rooms, the most interesting of which is the gallery on the second floor, measuring 50 feet by 18 and some 13 feet high, and containing a painted ceiling of very curious design. This is a wooden boarded ceiling taking the form of a flat semi-ellipse, and comes down on to the walls without any cornice or moulding. The upper part of the wall is divided into compartments by arcading formed of painted pilasters and flat arches. In each compartment was a motto. Most of these have long since disappeared, but one of the few remaining informs the reader that "A nice wyf and a back doore oft maketh a riche man poore." The ceiling itself is divided into upwards of 300 panels, alternately square and circular, and joined by scrollwork. The circular panels are filled in with heraldic devices, the arms of Bruce of Earlsall being depicted in the centre. Immediately around are grouped shields bearing the cognisances of the families with which the Bruces were allied matrimonially, and to the west the arms of many of the noble families of Scotland. The square panels are filled in with representations of animals, which, there is little doubt, were copied out of some Mediæval "bestiary," of which examples still exist in the Bodleian at Oxford and elsewhere. The decoration, which is in black and white distemper, is altogether a piece of seventeenth-century fancy-work quite unique in its kind. Its preservation was a task of some difficulty owing to the deplorable condition that the roof of the house had been allowed to get into. The ceiling in a bedroom shows decoration of a similar character. This is a flat ceiling formed of massive beams with plain boarding, the space between the beams being divided into panels by scrollwork, with a picture of an animal in each alternate panel. It is curious, in a house of this date, to find that it does not contain any enriched plasterwork, a form of decoration in which some of the old Fife houses are very rich. The "cat-hole" is to be seen cut through the lower panels of many of the doors. This seems to have been a common custom, and sometimes the hole was provided with a little sliding shutter on the room side of the door, the use of these holes apparently being to enable the cat to hunt the house from attic to basement whenever the humour seized her. The fireplace in the stone hall is also worthy of note, as it has a granite lintel 11 feet by nearly 2 feet deep, and all in the one piece.

ARCHITECTS AND BY-LAWS.

AT the Birmingham County Court, on Saturday, an action brought by Mr. Moses Levenberg, a gentleman residing in London, against Mr. William Wykes, architect, Colmore Row, Birmingham, to recover 50*l.* damages for alleged fraudulent misrepresentation, was tried by his Honour Judge Chalmers and a jury. The case for the plaintiff was that in 1887 he erected three houses, Nos. 21, 23 and 25 Portland Road, Edgbaston. The defendant was employed as the architect and Mr. Brookes as the builder. The specifications drawn up by the defendant showed a separate drain communication from each house with the main sewer by a 6-inch soil-pipe. From time to time Mr. Wykes gave certificates that the work was being carried out, and on these the plaintiff made settlements with the builder. Subsequently Mr. Wykes gave the plaintiff a plan, which showed that the drains had been laid as required by the plan deposited with the authorities. Plaintiff had no reason to think otherwise until November 1892, when he received a letter from the sanitary inspector stating that the drains had not been laid in accordance with the plans deposited with the Corporation. An investigation showed that a 9-inch soil-pipe had been laid from No. 23 to the main, and that the drains from Nos. 21 and 25 communicated with this soil-pipe and not with the main. As a result, the complainant was compelled to alter the drains and spent about 24*l.* in laying them in accordance with the original plans. Plaintiff therefore contended that he was induced, by the defendant giving his certificates to the builder, to pay the builder the money payable under the contract, whereas the drains were not laid in accordance with the contract. Evidence was given by the plaintiff, who admitted in cross-examination that the defendant had power under the contract to make alterations and deviations from the plans.

Mr. Young, on the part of the defence, did not dispute that the work was not carried out according to the plans, or that the plaintiff had to spend money in 1892 to alter them. Defendant

said he was quite aware at the time that alterations were being made in the system of drainage. He sanctioned the deviations, which did not break the by-laws then in existence. He did not think it was necessary to draw the attention of the plaintiff to the deviation when he sent in the account for deviations. He had no intention to deceive, and acted honestly, as he thought, under his power as architect. In cross-examination defendant said he did not inform the Corporation at the time he made the deviation.

The jury found for the plaintiff, with 24*l.* damages.

Mr. Hugo Young applied for a stay of execution on account of misdirection. His Honour had directed the jury that they were entitled to consider whether by the certificates or by conduct the defendant had made a misrepresentation. He submitted that the judge was not justified in making such a direction, as the only fraud alleged in the particulars was the giving of the certificates.

His Honour said the certificates in themselves were nothing—the conduct was in sending the certificates.

Mr. Young said of course he did not know what view he might take as to appealing, on further consideration.

His Honour granted the stay of execution for twenty-one days on the payment of 25*l.* into court.

ARCHITECTURAL CONFERENCE IN LIVERPOOL.

A CONFERENCE of delegates, representing architects in various towns, was held on the 21st inst. at the University College, Liverpool, for the purpose of considering the proposals of the Council of the Royal Institute of British Architects "for dividing the United Kingdom into architectural provinces or districts, of which the societies now or hereafter allied to the Royal Institute would be the respective centres, one object of thus dividing the United Kingdom being the promotion of architectural education by the systematic organisation for educational purposes of such means of instruction as are at present available in the respective centres."

Mr. Henry Hartley, vice-president of the Liverpool Society, was chairman. The delegates came from Manchester, Leeds, Sheffield, Birmingham, Dublin, Liverpool, Nottingham, Bristol and Leicester.

Mr. Solomons moved, "That this conference of delegates from the provincial architectural societies in alliance with the Royal Institute of British Architects has heard with great satisfaction the proposal to divide the United Kingdom into architectural provinces, which, if successfully carried out, will so materially advance the interests of the profession throughout the country." The whole scheme seemed so desirable that he did not anticipate the slightest opposition.

Mr. Culshaw seconded the motion.

Mr. Arthur Cates said they had at present thirteen societies and possibly two or three more might be organised in the south and west. He could not say exactly what was proposed to be done in Ireland, but he thought from fifteen to sixteen would be the number all told.

Mr. T. Drew, R.H.A., said that at present they proposed only one centre for Ireland, at Dublin.

Mr. Beckwith said that there was no society in Wales, and it was a question whether Liverpool and Bristol should not divide Wales between them.

The resolution was carried unanimously.

Mr. Bulmer moved the following resolution:—"By the establishment of such architectural provinces the architectural society of each district will have its local centre, and in time, by absorbing within its centre all architects of repute, bring into harmonious and united action the scattered and unorganised members of the profession, strengthen the position of all local practitioners, both professionally and socially, and enable arrangements to be made for extending throughout the country the advantages of the progressive examination now established by the R.I.B.A., and by promoting a systematic organisation for educational purposes, utilising and developing such means of instruction as may be available at and in connection with such centres, raise the standard of architectural education in all parts."

Mr. Murray seconded, and after a discussion on the present educational facilities in the various centres the resolution was unanimously adopted.

Mr. A. Heazell moved, "That, so far as the constitution of the R.I.B.A. and each society may permit, it is desirable that the president for the time being of each provincial centre shall have a seat on the Council of the Institute; and that this conference do represent to the Council the desirability of steps being taken to obtain such modification of by-law No. 25 as will enable this to be done."

Mr. Pick seconded the motion, which was agreed to, the representatives of the Institute expressing their concurrence.

Mr. E. Jones proposed, "That the secretaries of the several

provincial societies be requested to confer together to consider the boundaries of each province proposed to be attached to the respective centres for the purpose of provisionally defining the same, and then communicating the same to the Royal Institute."

Mr. Gibbs seconded, and the resolution was carried.

On the suggestion of Mr. Cates it was resolved that the secretaries meet in committee at the close of the present proceedings for the purpose, as far as possible, of agreeing upon a provisional report.

On the motion of Mr. Emerson, seconded by Mr. Drew, a vote of thanks to the Chairman for his conduct in the chair, and to the Liverpool society for their hospitality, was passed. The formal proceedings then closed, and the secretaries met in committee to discuss the boundaries of the several provinces.

GLASGOW CATHEDRAL.

AT the monthly meeting of the Glasgow Archæological Society, Archbishop Eyre read a paper on "The Western Towers of Glasgow Cathedral." His Grace expressed regret that the towers, which had been erected immediately after the original building in the fourteenth century, were pulled down about fifty years ago. They were, he pointed out, removed in an age when the style of architecture was imperfectly understood. The people had the impression they were built only just before the Reformation, and consequently were so plain that they were not worth retaining; and an agitation was started for their removal, in which the Lord Provost, the Dean of Guild and other officials took part. They proposed to replace them with something more ornamental. Drawings were obtained, and although the towers were satisfactory so far as Pointed architecture was understood at that time, they would now be totally condemned. The south-west tower—which was the plainer of the two, but venerable from its antiquity, having been used as the consistory house for two hundred years—was demolished about 1846. Two or three years later the north-west tower was pulled down, although a number of architects remonstrated very strongly against it, and petitioned the city authorities in favour of its preservation. There was an idea that another tower would be substituted, but that fortunately, His Grace observed, never was built. The removal of the towers reduced the length of the building, making it more like a very large parochial church than a cathedral church. Archbishop Eyre was unfortunately seized with a slight attack of weakness, and the concluding part of his paper was not read.

PREHISTORIC MONUMENTS IN STIRLINGSHIRE.

AT the last sessional meeting of the Stirling Natural History and Archæological Society Mr. A. F. Hutchison delivered a lecture on "The Standing Stones and other Rude Monuments in the Stirling District." In his introductory remarks Mr. Hutchison mentioned that the sites of these ancient monuments pretty nearly followed the contour of the hill ranges in the district, but no definite conclusion could safely be drawn from this fact, as the lower grounds could be more easily cleared of the stones, which would disappear under the culture of the land. One rather remarkable circumstance was that in nearly every case where these stones could be said to point in any direction, that direction was about 250 deg. magnetic north, the point where the sun rose during the summer solstice, and this suggested that the stones had some connection with sun-worship in pagan times. Cup markings were to be seen on several of the stones, and while these peculiar indentations were still an enigma to archæologists, Mr. Hutchison said he would not be surprised if they turned out to have some relation to the movements of the heavenly bodies. There was also reason to believe that these standing stones marked ancient burial-places, as cists had been discovered in the vicinity of some of them. Mr. Hutchison then proceeded to give details of a large number of stones which he had personally visited and measured. A few of these had been previously noticed, but the great majority had been hitherto unknown.

At the Meeting of the Glasgow Philosophical Society Mr. W. F. Murray, of the Caledonia Pottery, Rutherglen, read a paper "On a New System of using Gaseous Fuel in Firing Pottery Ware." In explaining his system he remarked on the extravagant use of fuel by potters and the economies that had been introduced by the adoption of scientific methods of obtaining and applying heat in the metal industries. Similar and greater economies, he said, awaited the pottery trade, which were to be reached by the same paths as had led to comparative prosperity among metal-workers.

NOTES AND COMMENTS.

ON May 11 the subscribers to the Architectural Publication Society will hold a general meeting which may be the final one. Originally the Society contemplated the production of a cyclopædia of architecture, but after a brief experience of the aid that was forthcoming it was decided in 1852 to limit the operations to the compilation of the "Dictionary of Architecture." Owing to the untiring zeal of Mr. WYATT PAPWORTH, that work was completed about a year ago. Under the circumstances, it was not to be expected that the pages of the Dictionary would express all the knowledge that relates to architectural subjects. The majority of architects, especially those who claim to be experts on any subject, naturally are inclined to keep to themselves any information they may have gained. Accordingly, it was necessary to make the most of books and articles in journals. Eventually the Dictionary became a sort of index to professional literature, and as such it ought to be useful to students. The critical standard became more restrictive during the forty years the Dictionary was in progress, and more was expected than could be furnished. Yet only eight complete sets of the Dictionary remain unappropriated. The committee are in hopes about the copies being speedily purchased, but it has been wisely decided that no reduction of the subscription of 21*l.* will be accepted. If after six months any sets remain on hand, it is proposed to present them to libraries or public institutions. Few societies, under similar circumstances, would escape financial embarrassments, but in this case Mr. ARTHUR CATES is able to announce that "the cash in hand will suffice to meet all current expenses until the affairs are entirely closed, and even should no further moneys be received by the sale of sets or parts, some small surplus will remain available to be appropriated as the meeting may direct."

THE French artists have reason to be gratified with the admiration of the Americans for their works. As it is now necessary to pay duties on pictures and other works of art it is easy to discover the value of the imports of that class. According to an official return, the value of French works for the year 1889-90 was 1,682,000 dols., for 1890-91 the value was 1,768,000 dols., and for last year 1,681,000 dols., or in three years French artists gained to the extent of over one million sterling from the United States. It is not impossible that a reduced valuation was placed on many of the works to save duty, and the expenditure would therefore be greater. Figures so satisfactory must give rise to the question, Why is the sale of English works of art among Americans so limited in extent? The French artists do not lay themselves out to captivate American purchasers, and yet somehow they succeed in doing so. The English works, we suppose, are considered too insular in character or too costly, and hence it is that foreign as well as American dealers do not trouble themselves about Royal Academy exhibitions, while they appear in force at the Salon.

It is not altogether advantageous for the fame of a French artist when his birthplace is a village or small town. The inhabitants may do their best to show their pride in the great man, but their efforts in that way sometimes are embarrassing. A case has just occurred in Mée, near Meulan. M. CHAPU, the sculptor, is a native of the place, and he presented a large number of models to the town. Having worked themselves up to an emotional pitch, the municipal council resolved that the treasures were to be inalienable while Mée endured. The magnanimity of the declaration is unquestionable, but if a visitor to the town cannot behold M. CHAPU's works, who can deny that they have been alienated? The models are placed in charge of the schoolmaster, and as long as he attends to his classes he cannot be curating. He is likely to suffer in the reports of his inspectors if he leaves his scholars. Under such circumstances, will M. CHAPU's gift produce much benefit for the embryo sculptors of Mée?

JOAN OF ARC is to have another memorial in the form of an equestrian figure. In the last Salon M. JULES ROULLEAU went into competition with M. FRÉMIET, for he

represented the girl in full armour, with the oriflamme in one hand and the sword in the other. The war-horse on which she was mounted appeared to be vigorous. The work was nearly successful in winning the médaille d'honneur for sculpture. It has been arranged that the work is to be cast in bronze and set up in the middle of the principal place of Chinon, the town where JOAN recognised CHARLES VII. in disguise amidst a crowd of courtiers and attendants. The pedestal will be designed by M. HENRI DEGLANE, architect. It is expected that the work can be placed in position some time during the year.

TO-MORROW (Saturday) will be varnishing-day at the Salon, when the price for admission will be ten francs. On Sunday next the charge will be lowered to two francs, and on Monday admission will cost five francs. During the afternoon of the Sundays in May half a franc will be charged, while in June there will be gratuitous admission on the afternoon of all the Sundays.

THE Opera House in Paris is so costly to the State, it is no wonder so many reformers are eager to adopt the English system, and to allow the managers to depend on the public without the aid of subventions. Everything that is necessary for the production of operas, or for upholding the house, runs to an amount of money that is startling to the French taxpayer. The latest proposal corresponds with those which have preceded it. An iron curtain became necessary, and of course it cost an enormous sum. It is found that hydraulic machinery is necessary to raise and lower the screen with expedition and smoothness. Of course the expense falls on the authorities. The Municipal Council will have to pay 20,500 francs towards the expense, and the State must contribute a similar sum. In England a manager would hesitate before he laid out 1,640*l.* for moving a drop-scene, and an English hydraulic engineer would, with the aid of a water company's main, get over the difficulty for a comparatively small sum. But in France practical science is fond of making a fuss about trifles, and so much will have to be done before the Paris curtain can be raised an inch, we are rather amazed that a couple of thousand of pounds sterling are not stuck on to the estimate. Whatever the outlay the taxpayers must meet it.

THE unoccupied land which is a legacy from the Metropolitan Board of Works to the London County Council is not a satisfactory sight to the inhabitants of London. It suggests either that the improvements were not needed or that the prices paid for property, and which determine the rent of vacant sites, were in excess of the value. The Corporate Property Committee have therefore proposed and the Council have sanctioned various conditions which it is expected will find favour with speculators and overcome their objections to treat for the unoccupied land. In the first place the option will be given to purchase the reversion of the property at a price to be fixed jointly by the Corporate Property and Finance Committees, not being less than twenty-five years' purchase; such option being exercised within five years, and only in cases to be approved by this committee and the Finance Committee, and where the buildings to be erected have been duly completed in accordance with the contract for letting and to the satisfaction of the architect; secondly, the term of the leases will be for periods of not less than eighty years and not more than ninety-nine years, the exact period being fixed in each case by this committee and the Finance Committee before the publication of the conditions of sale. It is also agreed that, subject to any modifications to be approved by the Public Health and Housing and Corporate Property Committees, the conditions as to sale of artisans' sites be amended so as to provide for buildings being constructed with good and suitable material and workmanship, to the satisfaction of the architect. All the properties are to be offered for letting or sale by public tender. The Council will in certain cases suspend the standing order which requires that, in the first instance, all properties shall be submitted to public auction. The officers of the Council are to be instructed to make the necessary arrangements for tenders for vacant land.



BATSFORD PARK, MORETON-IN-MARSH
Messrs. ERNEST GEORGE

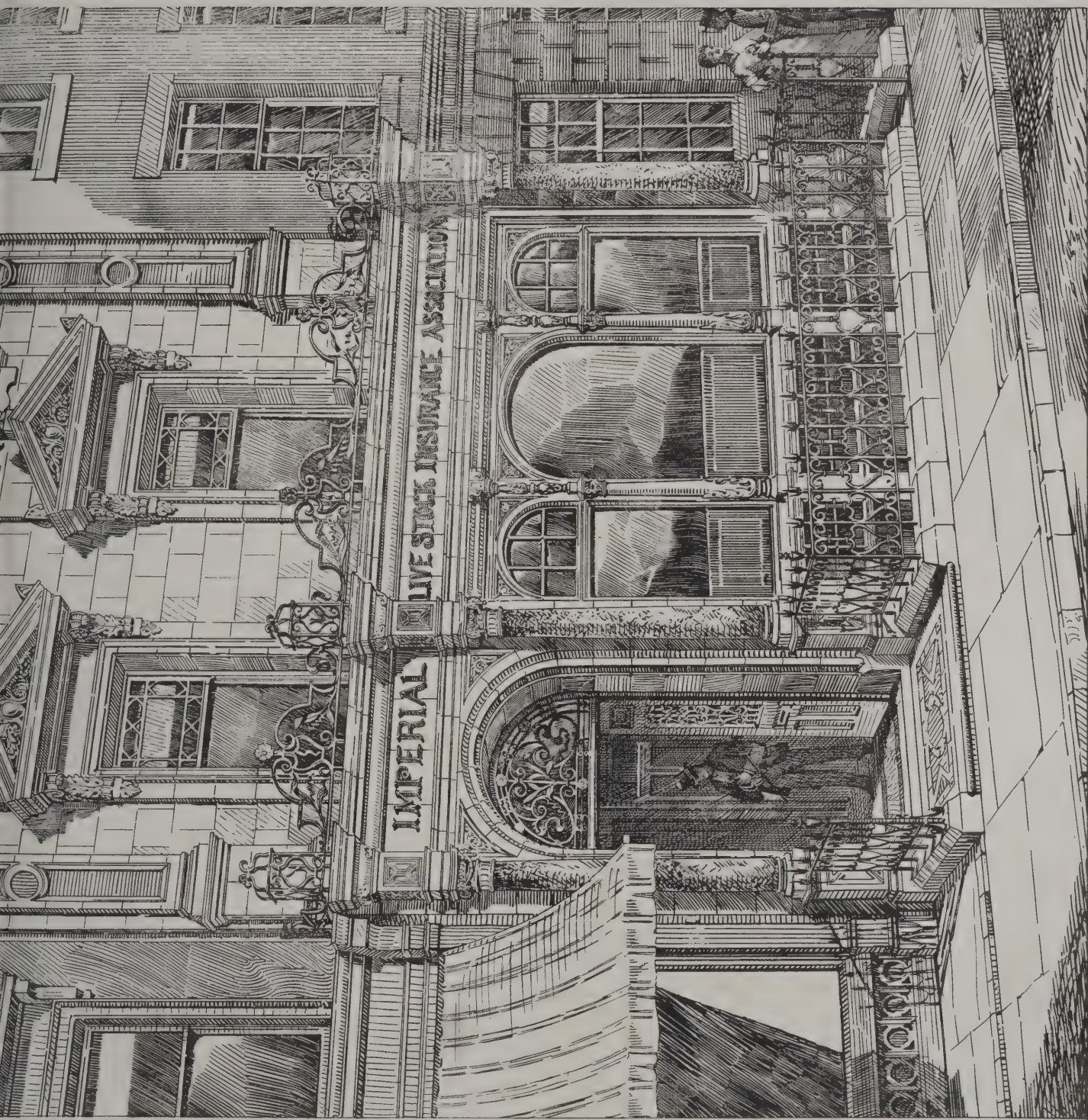
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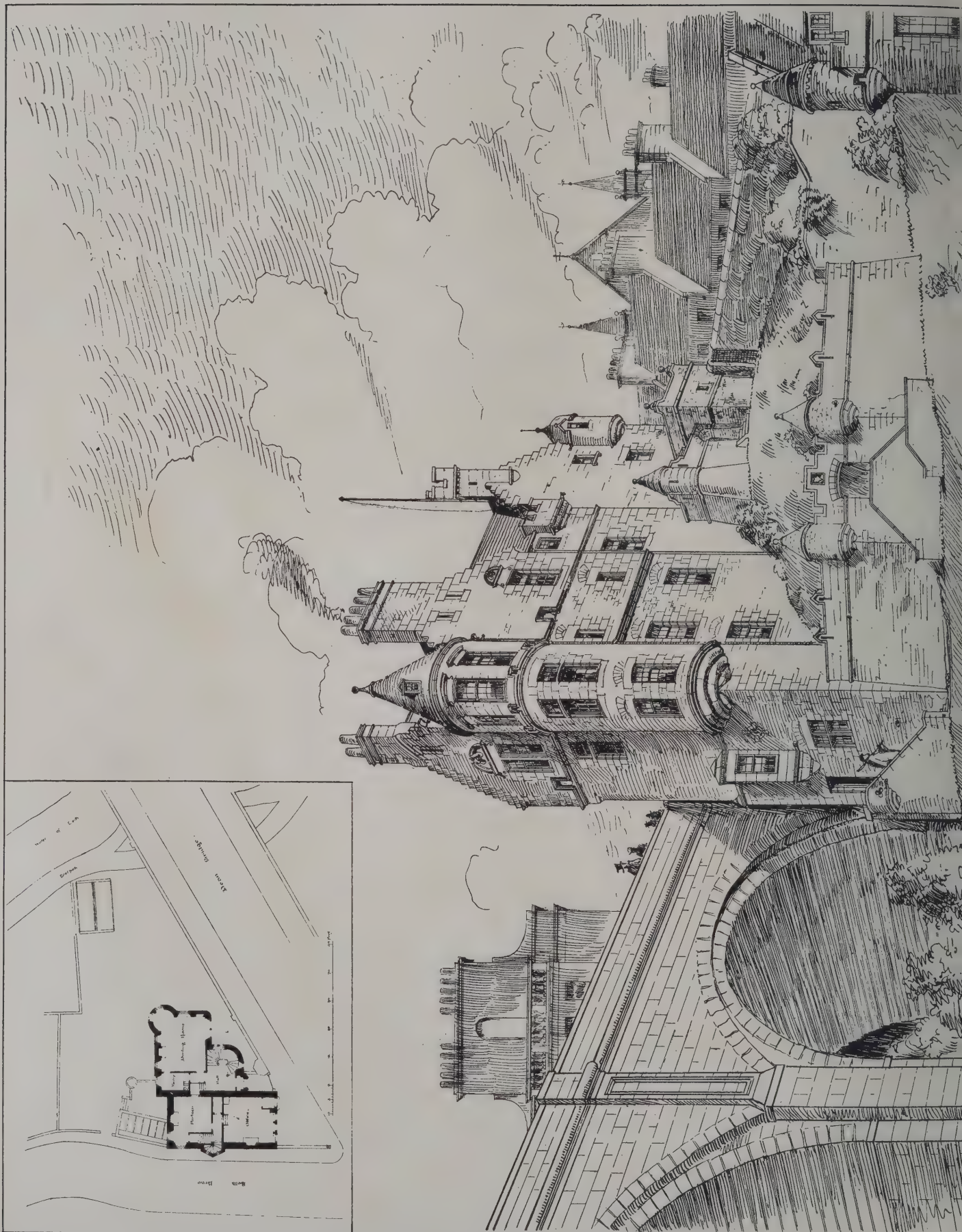


MARSH: GARDEN FRONT.
WETTON, Architects.

INK PHOTO SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.









KIRKBRÆ HOUSE, DEAN BRIDGE, EDINBURGH.

JAS. G. FAIRLEY, F.R.I.B.A., Architect

ILLUSTRATIONS.

BATSFORD PARK, MORETON-IN-THE-MARSH: GARDEN FRONT.*
[MESSRS. ERNEST GEORGE & PETO, ARCHITECTS.]

* From a photograph by Messrs. BEDFORD LEMERE & Co.

NEW PREMISES FOR THE IMPERIAL LIVE STOCK INSURANCE ASSOCIATION, LIMITED, 17 Pall Mall East.

THIS drawing represents a portion of Waterloo House, which is now being reconstructed from designs by Messrs. ESSEX, NICOL & GOODMAN, of London and Birmingham.

The ground floor and basement, with premises in the rear, will be occupied by the above Association, and the upper floors as offices and residential chambers. The front is executed in Portland and Dumfries stone, with Norwegian granite columns. The building throughout will be lit by electric light.

The contractors for the work are Messrs. SCRIVENER & Co., of Fitzroy Square, Regent's Park. The ornamental wrought-iron grilles, railings and balustrades by Messrs. BROWN & Co., and the lifts by Mr. GEORGE CLARKE. The stone carving and modelled enrichments have been executed by Mr. STEELE.

KIRKBRAE HOUSE, EDINBURGH.

THE illustration shows additions that have been made to an old and prominent house at the south end of Dean Bridge, Edinburgh, the property of Mr. STEWART. The site of this house is unique. It commands views towards Princes' Street, Firth of Forth, with Inchkeith in the distance, and Corstorphine Hill. None of these views can ever be built up.

Mr. YOUNG, Bryson Road, was the builder, and Mr. JAS. G. FAIRLEY, F.R.I.B.A., Edinburgh, was the architect.

In his "Old and New Edinburgh" the late JAMES GRANT said that Mrs. GRANT, of Laggan, lived in old Kirkbrae House. At that time her house was the resort of select literary parties, of whom Professor WILSON ("Christopher North") was always a member.

HISTORY AND DEVELOPMENT OF PATTERN DESIGNING IN TEXTILES.*

A GERMAN proverb says, "Kleider machen Leute," which is equivalent to the English "Fine feathers make fine birds." Another proverb runs, "We receive a man according to his dress and dismiss him according to his intellect." Accordingly, we find that it is a first principle in human nature to take special care as regards the attiring of the body. Savages only make a modest attempt by tattooing their bodies, while the civilised nations of all ages and countries have made an art of dressing themselves in splendid and rich costumes. This endeavour gave birth to an industry which, up to our days, has contributed in no slight degree to the prosperity of many towns and countries—I mean the textile industry.

It is not my purpose to read a paper upon the history and development of art and industry. My particular object is to give a very general summary of the evolution of textile design from the earliest times, and to show how many interesting details can be supplied by such an apparently insignificant subject as that of woven designs.

With regard to the period at which our investigations should commence, it might be considered that the art of usefully applying such perishable materials as the fragments of flax, the wool of sheep, and the fine threads spun by the silkworm, dates from no very distant time. But that is a great mistake.

We should be wrong in placing the birth of the textile industry at the commencement of the Christian era. We should be equally in error if we placed this period 1,000 years further back, to the time when Greek art was not yet spoken of, much less European culture. We can with confidence go back 3,000 years; that is, in all 6,000 years from the present time. Monuments of the early period prove to us that even then there was a culture in ancient Egypt which did not exclude the existence of a textile industry; on the contrary, its existence may be proved almost with certainty.

King Menes is said to have reigned over Egypt about the year 4000 B.C. He was accused by his successor of having enervated his people by excessive luxury. He was cursed by the priests (who also may be taken as a token of civilisation),

* A paper by Herr Paul Schulze, Conservator of the Royal Textile Collection, and Lecturer on Art in the Royal Weaving School at Crefeld, read at a meeting of the Society of Arts and published in the *Journal*.

and this curse was engraved upon a square stone. The author Ebers informs us how an Egyptian king's mother occupied herself with the study of physic, and concocted a lotion to make the hair grow. Now I think I may fairly conclude that a race of people who were in need of some means to make the hair grow more freely than in its natural condition, would not have neglected the protection and adornment of the other parts of the body; hence the existence of textile industry may be easily inferred. No remains of stuffs from this period are extant, but the paintings in the Pyramid show the Egyptians dressed in gowns striped with primary colours, blue, red and yellow. Besides this, little designs have been found which are evidently reproductions of woven patterns. There are little drawings of geometrical construction, combinations of lotus flowers, &c. There are also other motives in the designs from which we may conclude that they were applied to clerical vestures.

In a series of centuries we find that forms of certain animals, plants, &c., which were deemed sacred to religious service, were used symbolically for the designs for clerical vestments and antependiums. Hence it is probable that the Egyptians likewise used the forms of their holy animals and plants. This was particularly the case with the Assyrians, and the paintings of this race were very much like those of the Egyptians. I might, therefore, name some of the principal types which form the basis of Egyptian ornaments.

First, there are the buds and flowers of the lotus and papyrus plants, which were the symbol of the nourishment of the body and mind. Then the dung beetle or scarabæus. This insect has the remarkable habit of laying his eggs in excrement, with which it envelops the egg, and of forming a little ball. The beetle draws this ball after it with his hind legs until the surface hardens. The ball containing the embryo of a new life, which the heat of the sun will awaken, was to the Egyptians symbolical of the globe, out of which new life would spring, and of the minuteness of the Creator's work.

As the ancient Egyptians were sun-worshippers, their most sacred figure was the disc of the sun, mounting the sky on eagle wings. The Uraus serpent was the symbol of sovereignty over life and death, for the bite of this creature meant instant death. Beside these, many animals were sacred.

Another ancient state possessing culture was that of Assyria. The territory between the great rivers, the Euphrates and Tigris, was in early times the home of extensive industrial art. The Bible mentions the magnificence of old Babylon, and its circumference is said to have been about forty miles.

In the ruins of great Assyrian buildings were found plates made of alabaster, which were used for covering the walls. The prowess of the kings was shown on these plates. These give us plenty of clues to a textile industry; for we are able to ascertain perfectly well the manner in which the Assyrians made patterns for dresses, carpets and antependiums. On these plates the Assyrians are represented as being dressed in long loose gowns with fringes and embroideries to represent beasts fighting, fantastic forms of animals, bodies of lions with human heads and wings, human bodies with wings and birds' heads. Amongst these we see borders with stars, strings of roses, zigzag lines, winding curves, meandering lines, palmettos; and here also the disc of the sun with wings—the symbol of Assyrian sun-worship. A very characteristic ornament was the "Hom," the Tree of Life, which bears fruit like pomegranates.

The pomegranate plays a large part in the symbolism of many religions, as well as in the Christian religion. In ancient times it was the symbol of love: Jupiter makes the bridal Juno taste of pomegranates; Leah wanted to buy the love of Jacob—who loved Rachel better than her—with love apples, the smell of which animates love; and, lastly, the apple was the symbol of the generative power of nature, and was the forbidden fruit of Paradise. The Bible makes mention of weavings of an Assyrian character. Moses says of the makers of the ten large tapestries of the Tabernacle, which were ornamented with cherubim:—"Them hath (God) filled with wisdom of heart, to work all manner of work of the engraver, and of the cunning workman, and of the embroiderer in blue and in purple and in fine linen, and of the weaver" (Exodus xxxv. 35). About the official dress made for Aaron, Moses says:—"And they did beat the gold into thin plates, and cut it into wires, to work it in the blue and in the purple and in the scarlet and in the fine linen with cunning work. . . . And they made upon the hems of the robe pomegranates of blue and purple and scarlet and twined linen" (Exodus xxxix. 3 and 24).

A third great state of ancient culture in the far east of Asia is China. This empire has an important connection with the textile industry, being the native country of the most precious material for weaving, that is silk. In the year 2698 B.C. the consort of King Hongi, named Louitsen, is said to have invented the rearing of silkworms and the weaving of their threads. The strict custom of destroying with fire the dresses of the dead accounts for the fact that few or no remnants of old Chinese textile productions are preserved. Notwithstanding this, we are able to draw conclusions from modern drawings

as to those of times long gone by. A great characteristic of the Chinese is their adherence to ancient customs and a surprising power of resistance to foreign influences. With regard to art the Chinese are neither progressing nor falling back. They employ objects of all possible kinds, such as clouds, the waves of the sea, groups of rocks, shells, vases, &c., and all the flora. The lotus flower of the Egyptians is often used, as is also the peony, the symbol of the sky and the earth, deriving from the former flower perfume and from the latter brilliancy. We also find a number of fantastically-shaped animals, of which the dragon is a frequent figure—a marvellous creature, with the head of a chameleon, the horns of a stag, the claws of an eagle and the tail of a serpent. This dragon is the symbol of supreme wisdom. Its empire is all space, above the mountain tops, among the clouds, in the underground depths and in the air and the water. The dragon is the martial device of the Emperor and of the senior princes, possessing in this case five toes. The dragon of the junior princes not being so important has four toes, and that of the mandarins only three.

The device of the Empress is the phoenix, a bird with a peacock's tail and a head covered with protuberances. It symbolises a long and happy life. The Chinese horse, or "Khilin," has the body of a stag, the horns and tail of an ox and horse's hoofs. This marvellous creature appears in Assyrian art as a unicorn, and it may be traced up to the thirteenth and fourteenth centuries. Lastly may be mentioned the Chinese lion, or dog, named "Fo."

All these fabulous animals, together with specimens of the vegetable kingdom, and some very elaborate line compositions, form the elements of the extraordinary designs which the Chinese make use of in the decoration of their stuffs.

After considering the textile industry of the three oldest civilised nations in Asia and Africa, we turn to Europe, and give our attention to the nation which laid the foundation of European culture, that is Greece.

Until 1879, we are only able to draw conclusions as to the designs on Grecian stuffs from the decoration of old buildings and old pottery. Greek authors give a good deal of information upon the designs of these stuffs. Excavations made in South Russia, in 1879, have confirmed the supposition that no branch of industry or art has its own decorations, but the dominant style belongs to them all.

Amongst the articles found in the tombs, detailed and illustrated in the "Compte Rendu de la Commission Archéologique à St. Pétersbourg," in 1881, there were a number of fabrics, the age of which is denoted positively by inscriptions. From the tomb of a warrior of the fourth century a great cover, which was laid over the sarcophagus, was taken. It is about seven yards square. We see alternate mythological scenes and ornaments. This cover proves to be a Greek production, from the numerous inscriptions upon it in the Grecian language. The name Jocasta shows that scenes of the legend of Œdipus were being represented. The names Phœdra and Eulimene close by two women in violent motion, and the name of Atkaia point to the wrestling combat of Peleus with Thetis. The goddess Athene, armed with the protective ægis, and a lictor, returning from a chariot race, are also depicted on this cover. Another little piece of woollen material was found in a tomb, dating fifth century B.C. It is decorated with small zigzag, crosses, meandering lines and similar motives. In the same tomb which contained the large cover was found a piece of woollen material which was extraordinarily thin. One side of the fabric is bound with satin and the other with reps. The piece of stuff proves the great perfection of the Grecian textile industry. The patterns are woven upon a cherry-brown coloured ground in tapestry style. The design represents a series of five ducks with raised wings and heads, alternately turned to right and left. A beautiful dark green, whose brightness is very well preserved, is seen on the heads and necks. Other different fragments were found in the same place.

As these preserved fragments of the ancient Greek weavers' craft are of the greatest value to inquirers, so numerous literary references convince us of the cleverness of the Greek figure weavers. Their productions were worthy of a place by the side of their other artistic works—being of a high degree of merit. It is impossible to quote all the passages, but it may be sufficient to mention two of them.

Ovid, in his *Metamorphosis* of Arachne, says it was a pleasure to observe Arachne winding the wool and curling and twisting it into fine threads. She contended with Pallas Athene in a trial of their skill in weaving. Each puts her loom in a separate place, and stretched the fine threads thereon. The combatants hasten to their work. Pallas Athene weaves the Castle of Cecrops, standing on the rock of Mars. Twelve immortals are seated on their thrones, in austere solemnity, with Jupiter in their midst. Neptune, the sea god, alone is standing, and with his trident he strikes the unheaven rock, from which the salt water gushes forth. Pallas Athene is shown, furnished with the defending ægis, and having on her head a helmet and in her hand a pointed lance. At the place where the lance has

pierced the ground, a green olive tree, bearing berries, is sprouting. The work is surrounded by a garland. The gods look at it with astonishment.

It is very interesting to compare this woven picture, described by Ovid, with the splendid sculptured work executed by the celebrated Greek sculptor Phidias for the pediments of the Parthenon, now the temple of the goddess Athene, on the Acropolis.

England is fortunate enough to possess, in the far-famed Elgin Marbles in the British Museum, the original remnants of this work of Phidias. This sculpture also shows the representation of the quarrel concerning the name of the town of Athens.

But Arachne wove the story of Europa carried away by the bull. The latter seems to be really living, and the sea to be heaving. In addition, Arachne wove Asteria seized by the flying eagle, the loves of Leda and the swan, and other similar scenes. An ivy garland went round the border, with flowers interwoven. Ovid reports, moreover, that Pallas Athene was not pleased with Arachne's work; on the contrary, she punished her by changing her into a spider, ugly indeed, but a skilful weaver. This was Arachne's punishment for having had the temerity to remind the daughter of the father's amorous adventures. A passage in the *Odyssey* also gives a clear image of Grecian designs. Ulysses describes to Penelope the dress he wore on his departure to Troy. The dress of the noble Ulysses was of a purple colour, and rough in texture, with flashing embroidered front. A spotted doe is struggling under the forelegs of a savage-looking dog. The astonishment of all beholders is excited by the manner in which the dog embroidered in gold is strangling the doe, while glaring at it most ferociously, the latter meanwhile endeavouring to regain its freedom. This embroidery is very interesting, because we find among the stuffs of the thirteenth century a very similar design.

Such weavings of Roman origin as have been preserved date from the time of the Roman emperors. A very rare little piece of silk—perhaps belonging to the time before Christ—is preserved in the church of Valeria, at Sitten, Switzerland. The design shows a female figure, sitting on the back of a sea-dog, and under the latter an acanthus stalk. This stuff from Sitten, the Greek fragments already mentioned as being found in Southern Russia, and perhaps two or three other little remnants in various museums, are the only known remains of textile products of the time before Christ.

To arrive at the place where probably the oldest weavings of the Christian era were produced we must again return to the country which has shown itself so well able to preserve the treasures entrusted to it. I mean Egypt. In Sakkarah and Akhmîm, in Upper Egypt, large cemeteries have been discovered in recent years. The dead bodies contained in them were not enveloped in strips of linen, as were the old Egyptian mummies, but were dressed in the garments they had worn when alive. We obtain a complete picture of the costume of this period. But we are more interested in learning the materials of which the garments are made. There is the towel-faced material, which when used for costume was worn in the winter. In the height of summer, when steeped in fresh water, the peasants would use it to wrap round the wine amphora to cool its contents. They had also a kind of wool rap, a compact twilled woollen material with a woven broad purple stripe, woollen cloth, evidently woven over rods, looking like velvet with an uncut pile. But our greatest interest will be excited by the woven bands crossing each shoulder and running vertically down the front and back of the robe, and by the round and square pieces of cloth, the medallions, which were the signs of rank. These articles were woven in tapestry style, with many-coloured threads, in wool. There are ornamental and figure-pieces in great variety—bull-fighters, slingers, bowmen, mounted hunters with lances, hunting-lions and leopards, and a variety of animals, such as wild goats, hares, birds, &c. Further on, medallions with biblical scenes, perhaps the history of Joseph in Egypt, or another one showing Abraham about to sacrifice his son Isaac.

Not only were woollen fabrics found in excavating these tombs, but also silk materials. We find little designs, not larger than the size of a pea, composed of little lozenges, hearts and clubs. In squares or circles occur horsemen or dancing-girls similar to designs on Persian fabrics mentioned later on.

At present it is hardly possible to say positively whether these fabrics were manufactured in Persia or whether they were woven in Alexandria, Antioch or Byzantium. Similarly we are not yet able at present to determine the age of these goods. At all events we have reason for supposing them to be some of the oldest-preserved woven products of the Christian era, belonging to the time from the third up to the eighth century.

Now let us consider the Persian woven designs. At the time when the Romans were losing more and more of their independence, owing to the enervating results of their social life and the lassitude of their rules, and when from these causes the Roman Government was hastening to its ruin, the Persian

empire in Asia was building up a new civilisation upon the ruins of a culture then long gone by. In the year 226 B.C. Artaxerxes I. took in hand the government of all Central Asia. He founded the family of the Sassanides, who reigned in Persia 426 years. The greatest prince of Persia was Chosroës Anurshirwan, 531-79. During his reign commerce, industry and weaving of a high character flourished. Some original fabrics, kept till the present day as covering for relics, prove the great perfection of this Persian textile industry. If we analyse the designs upon the Sassanide weavings, we mostly find large circles standing in rows one upon the other. The points of contact are covered with roses, smaller circles and polygons. This is a very characteristic design, and one which occurs in Persian and Byzantine fabrics of the fourth up to the twelfth and thirteenth centuries. In the church of St. Servatius at Maestricht there is exhibited a small collection of fabrics of the Middle Ages. Amongst them is a very brilliant specimen of Persian weaving skill. A broad circle decorated florally encloses two Persian kings hunting lions on horseback. Hunting-scenes very often appear on Eastern fabrics, because the Orientals are great sportsmen, and we shall see similar scenes until the end of the Middle Ages. The riders and huntsmen are not always arranged in circles; we also see men on horseback, sometimes with wings, placed in rows without circles, or in squares or polygons, great lions gravely stepping in order one after the other, or two of them facing one another. Very interesting examples of Sassanide fabrics are preserved in the treasuries of the churches on the banks of the Rhine and in Aix-la-Chapelle, in several museums, such as the South Kensington Museum in London and in the Museum of Industrial Art in Berlin.

We now return from the Persian land of wonders to European ground, and consider the silk-weaving of Byzantium. This new capital, which at the time of Constantine the Great had taken the place of ancient Rome, endeavoured to emulate the old city in all matters appertaining to art. In Byzantium the artistic capabilities of the Old World were concentrated. Here the flickering spark of art was fanned to set ablaze a new art-life later on; whilst in the Western countries, owing to the violent disturbances attending the migrations of tribes, the influences of art were decaying more and more. In the beginning of its development Byzantine, or early Christian art, was a hybrid formed by the influences of the Western nation which ruled over Byzantium and by those of the Asiatic races subjugated by the Roman. With the government of the Emperor Justinian I. (527-65), a new epoch was inaugurated, and a new style created.

The Byzantine style flourished up to the early part of the thirteenth century (1204). At this period the decline of this splendid and pompous style commenced, but the inhabitants of the eastern Roman Empire continued under its influence until the time when the Turks conquered this once mighty empire (1453).

The reign of the Emperor Justinian was the prominent feature of the Byzantine Empire, as well in art as in history. Justinian I., not without reason, has been compared with Louis XIV. Both showed the same activity and capability, both were animated by the same bigotry, both were under the influence of petticoat government, and in the states of both sovereigns ambition for military glory and a great love of pomp, nourished by taxes, produced the same results. Justinian employed all the financial schemes of modern politics to swell the public revenues, such as every description of tolls, duties on eatables, state monopolies, &c. Of the latter, the monopoly of manufacturing splendid silk goods is particularly remarkable. The rearing of silkworms in Europe cannot be traced back earlier than the reign of Justinian. Before this time the silk was imported from India and China, in which countries its production was guarded as a great secret, and the export of eggs of the silk moth was attended with severe penalties. The legend runs that two monks conveyed in their hollowed pilgrim staves some eggs of the silk moth and seed of the mulberry tree, so important for its nourishment, when returning from a pilgrimage from distant China in 555. These were the germs from which an industry was to be evolved, and to which Europe owes a large part of its present opulence.

Justinian was able to appreciate the great importance of silk weaving and silk industry. He brought into his own manufactories silk weavers from those countries which were in competition with him.

We have seen how the Persian kings of the family of the Sassanides established silk manufactories in the same manner as Justinian. They paid great attention to the silk trade, rightly valuing their favourable geographical situation, which placed them midway between the East and the West. For this reason Justinian engaged first-rate Persian weavers for his imperial factories. It followed, as a matter of course, that these weavers did not immediately resign their own tastes, and thus we find, especially in the earlier part of this period, great relationship between the Byzantine and Persian drawings. Of course there was a reciprocal movement in this matter, because

the Persian kings also made use of the excellence of the Byzantine textile industry at that time by engaging weavers from Byzantium. There is an additional factor in this likeness between the Persian and Byzantine woven designs; the latter also show us figured pieces surrounded by large circles.

In the treasury of the church at Maestricht there is kept a piece of stuff which belonged to the garment of St. Servatius, the patron of this church, in which he was buried. The figured part of this design is surrounded by connected circles having a diameter of a quarter of a yard. Within the circle two brothers stand upon a Doric column, perhaps Romulus and Remus, or the two Dioscuri, Castor and Pollux. On each side of the column a bull is being sacrificed. Two angels pour out a libation.

According to Dr. F. Bock, a praiseworthy investigator and collector of textiles, this fabric is the only piece of silk which gives a representation of a heathen sacrifice of animals. The technical detail is remarkable. We observe four colours in the woof: the ground is dark crimson; the outlines of the floral ornament and of the figures are covered with dark violet purple; the carnation and some parts of the garment are woven in yellowish-white silk; and, lastly, green is employed on the garments and for the floral ornament. We can assign the manufacture of this very interesting fabric to the fourth century A.D.; and it is quite possible that the material was really part of the dress of St. Servatius, judging not only from the design, which is characteristic of the period, but also from other reasons, such as the traditions attached to this rare piece of silk and its discovery and preservation. A powerful argument is furnished by the great resemblance of the ornament in the circumference of the circle to the ornament, similarly placed, which appears on a piece of silk found in a Coptic tomb in Egypt. The design is undoubtedly the same, and, as Coptic fabrics have been found with papyrus documents, which are dated from the fourth century, there is no reason to doubt but that this material, attributed to St. Servatius, did belong to him. This is the more probable, as that saint went on a crusade from Asia Minor to the north of Germany, Belgium and Holland.

Another celebrated fabric is preserved amongst the treasures of the Aix-la-Chapelle Cathedral. Here also we see large connected circles, with diameters of over half a yard. The figured centre, a team of four horses, is sure to relate to the chariot races, which were so popular at the time of Justinian that the two great political parties of Byzantium used to wear the colours of charioteers. Hence the name of the parties "blue" and "green."

A scene very often represented in designs of the seventh and eighth centuries is that of a man fighting with a lion. It may be the fight of Hercules with the Nemean lion, or Samson strangling the lion, or finally the struggle of Christian martyrs with wild beasts in the Roman amphitheatre.

It is not possible to describe here all the woven pieces made under the influence of Byzantine art up to the thirteenth century. It may be stated that most of the designs were composed of animals facing one another and surrounded by graceful ornament. All possible varieties of animals were made use of. In old inventories of churches we find mentioned the chasuble with lions, the eagle dress, the chasuble with elephants, &c.

An interesting brocade, with pattern of lions, is preserved in the South Kensington Museum. Dr. Franz Bock, in Aix-la-Chapelle, one of the best connoisseurs of ancient textiles, says in his book "*Die liturgischen Gewänder des Mittelalters*," with reference to this design:—"If in Christian art the royal lion of the tribe of Judah represents our Saviour, which fact is undoubted, then in this design our Saviour would be Lord and Commander of the whole creation, and it would be possible to find a reference in this design to the Psalm, 'Thou wilt stalk across serpents and salamanders.'"

A cope with large eagles is preserved in Brixen Cathedral in Tyrol. On a red satin ground we see large eagles in a dark greenish black colour. The actual size of the eagles in the pattern, taken from one wing to the other, is 20 inches.

A most interesting pattern is to be seen on the splendid silk stuff in which the bones of Charlemagne were enveloped in the Aix-la-Chapelle Cathedral. The ground colour is red, the elephants and ornaments white, yellow, blue and green. The diameter of the circle is 32 inches. Besides these fabrics bearing the large designs, several remnants of materials are preserved, which show smaller patterns of geometrical construction. There are pieces of small octagons, roses, little crosses and such like. The quarrels of the image worshippers and image breakers in the eighth century perhaps had their influence upon figured textile design. Even art was outlawed, being considered an accomplice of idolatry. But this is a matter I leave to others.

Remains have been preserved of another class of silk goods which have their interest from a technical point of view. Owing to the method employed in binding the warp and the weft, the finely-drawn designs, composed only of outlines, merely appear as though engraved upon the shiny satin surface. It is very

probable that these fabrics are also examples of Byzantine textile art. The period at which they were produced is determined by the places where they were discovered, and by the traditions attached to them. In the cathedral of Xanten, near the lower Rhine, a yellow chasuble of St. Bernard, and in Mayence Cathedral, a green chasuble of St. Willigis are shown. In the Royal Museum of Industrial Art at Berlin, and in the Royal Textile Collection at Crefeld, are exhibited pieces of the garment in which the German Emperor Otho the Great (936-73) was buried. The dyeing of the materials forms a very interesting part of the examination of the Byzantine textile manufacture. Without entering into detail, it may be shortly stated that purple was the most valued colour of the Middle Ages. It comprised six shades of colour, from the darkest violet to the purest violet-red. The imperial purple possessed a deep, dark tone, like that of the violet flower. In the times of the Roman emperors the real purple from the *murex* shell-fish was worth its weight in gold; the use of this colour was confined exclusively to the imperial court and the church. The purple of Alexandria and Tyre has been famous from the earliest times.

The consideration of textile design subsequent to the decay of Byzantine art brings us to the art of the Mohammedans. With the spread of Islamism a great revolution of culture took place. Owing to the rapid propagation of Mohammed's doctrines, his adherents, within 100 years after his death, had obtained a footing eastward as far as the banks of the Ganges, and westward over all the northern part of Africa, as well in Sicily as in sunny Spain. The Arabs transported into their newly-conquered dominions not only their creed but also their culture and science. In Spain splendid palaces arose, all the pomp and luxury of the East expanded, and industry and commerce reached a height never before attained.

(To be continued.)

LOCKS AND SAFES.*

(Concluded from page 264.)

RENAISSANCE work pure and simple now claims our attention, and we are able to point to some very pronounced specimens, as regards keys especially. A serrurier, named Mathurin Jousse, published a book on his trade at Paris in 1627. He discourses on the behaviour of apprentices to their masters and of their treatment by their masters; tells how he prepares his metal, and how he shapes his tools; descants on the shapes of padlocks; gives names to multitudinous key-wardings; describes a file-cutting machine, and finishes up with an invalid's wheeling chair, and artificial arms and legs made in sheet-iron. The book is fully illustrated, and one of his four keys is reproduced in diagram. Another of his keys is almost exactly like the celebrated Strozzi key from Florence, now in the possession of Baron Adolphe Rothschild, and said to have been made by Benvenuto Cellini; but M. Piot, a French writer of authority, doubts this. Jousse incidentally says that ordinary padlocks with spherical bodies (here is one) were easy to make, but when they had two hasps, and a key going in each side to secure each hasp, they were difficult. Here is an exact copy of one of these, the original being in possession of a friend in Germany. Jousse also says that a lot of time was unnecessarily wasted through apprentices having to spend so much over their guild work required for initiation. Would that there were some such high standard to be passed now. In Germany, apprentices formally smoked themselves into their guild, using pipes in shape of keys. Jousse's escutcheon plates, whilst no doubt true to his times, show classical grotesques painfully conceived, but even they are not as repellent as some of the later German ones. These latter have been illustrated in a series of process photos, lately published at Munich. In these mere surface scratches do duty for bold incision, and hardly any *repoussé* is used to give force to designs that need it.

In viewing these two periods, the Française and Renaissance, we almost lose sight of the mechanism in the art. With the exception of the French letter padlock (about 1615) security seems to have been sought in elaborate arrangements of internal guards or "wards." These previously mentioned were projecting pieces of metal, plates and curved pins that swept round from the bolt to one side of the keyhole, and were fastened generally in a separate casing or box, hence called "box of wards." The key was shaped to clear them, and so get at the bolt. The bolts being usually "spring," it was not necessary that the key should turn right round, so a good many wards were used that would not have been possible otherwise. Here is one set of wards illustrated in a book published in 1767 by Hamel du Monceau. Had the key made a complete, instead of only a partial revolution, it would of course cut these wards right off.

The puzzle padlock, as is well known, was improved by a French mechanician, Regnier, at the end of the last century, but this was only one of the many things he did in combination locks. Anyone interested in the details of these will do well to study Bottermann's folio, 1781, and may then be surprised to see how little there is new under the sun. When keys were made of irregular shapes in cross-section and passed into their locks through keyholes cut to fit them—that is externally as distinct from being internally warded—there is considerable variety. The most curious one I have met with is illustrated in diagram, and was made for presentation to Napoleon I.

The work done by the English during the Mediæval and Renaissance periods is not as noticeable as that produced on the Continent. South Kensington has one show-case of English locks and several of French and German. Even the well-known lock-plate on St. George's Chapel, Windsor, is ascribed to Quintin Matsys (Wyatt), and we know that although, at an early date, the grilles around the tombs of Henry III. and of Eleanor, Edward I's queen, were done by Englishmen, foreign workers were being constantly invited over, even down to the end of the seventeenth century, when Tijou designed the gates for Hampton Court Palace. Tijou, by the way, illustrates four perfectly charming key bows. They are delightfully delicate and free in design. But I think to England is due the credit of decorating the stock lock, and certainly the combination of pierced bright or black iron over the strongly marked grain of oak is effective.

To get a good idea of the keys of the last century, one cannot do better than visit the collection of chamberlain's keys, bequeathed by Mr. Octavius Morgan to the British Museum in 1888. They come from Spain, Portugal, various German States and Denmark. The times and courts of our own king Georges are well represented amongst these eighty odd specimens. Two unnamed ones are double-ended pipe keys, drilled right through from end to end, and have circular-sliding bows that can be pushed up over either bit to make a handle for the other; they are nearly all gilt, and their bits are in many cases beautifully warded; as for the art of their bows, with the exception of some of the earlier ones, they are decidedly heavy. In at least one of them the emblematic and official idea is so paramount that the key-bit has disappeared altogether, leaving only the bow and stem; this is but natural, for often disused limbs lose their functions and in a few generations vanish.

These emblems of office suggest to us the symbolical ideas that have, as it were, hung about keys in all ages, prominent among them being that attaching to the presentation of a key to the Jewish rabbi on his institution, representing that in future the duty is his of unlocking and exhibiting sacred truths to the people. To those doctors of the law who did not do their duty came the condemnation:—"Woe unto you, lawyers! for ye took away the key of knowledge." There are many other scriptural references to the symbolical use of the key as an emblem of power and authority that will at once occur to us. These ideas, too, survive in folk-lore and superstitions, keys being used as talismans to prevent the entry of witches into houses or held by gipsy-women when prophesying or fortune-telling (Dillinger).

The spirit of applied science that sprang up one hundred years ago did not leave locks untouched. First came Barron, so altering and duplicating the old pivoted tumbler, or catch, that it or they had to be lifted to an exact height to free the bolt; and then Bramah, whose ingenuity was as much, or more, displayed in the machines he made to construct his locks as in the locks themselves. Many other names there are of subsequent inventors, all duly chronicled, with their mechanical ideas in the Patent Office, and more often known to us by this means than by the extent to which their locks have survived. Many inventions have lived for a time, but the Chubb lock, originally patented in 1818, has met with popular and continued appreciation, and now has a stronger vitality than ever. There is always a section in every community that demands things of the highest grade, and to this section the Chubb lock has always appealed. May I here be permitted to state, simply as a matter of fact, and without egotism, a curious matter bearing on this point of quality; it has a philological aspect, too. In the Straits Settlements the Chinese dealers have introduced a new adjective into their pigeon English; they speak of a "Chubby pair of trousers," or "a Chubby pot of jam," meaning that it is the best of its kind. The Chubb lock first achieved its notoriety chiefly from the fact of its containing a mechanism called the detector, by which the owner could tell if anyone had been lifting up its tumblers too much. This it still has in a slightly different form. Its tumblers vary in number, from six up to ten, according to the size and nature of the lock (a few small sizes have less than six). Contrary to the popular idea that the kinds of Chubb lock are comparatively few in number, the variety is so great that it takes a long experience to master their details.

I will now turn back to the early strong box, for its development into the safe and steel room is so closely connected with locks that the two may, in their modern aspect, be treated

* A paper by Mr. Harry W. Chubb, read at the meeting of the Society of Arts on April 12.

together. Dr. Schliemann, in "Troy and its Remains," tells us he thinks he found remnants of King Priam's treasure box, and gives an illustration of its probable key. In the Middle Ages cellars and vaults for storing valuables were protected by wooden doors sheathed with iron plates. Chests were made of oak or other hard wood, often strongly bound with iron bands, and sometimes, as in a beautiful specimen preserved at Knowle House, Sevenoaks, covered with leather. The German, or so-called Dutch, chests one meets with, made of little iron plates, rivetted together under bands, owe their peculiar construction to the fact that large sheets of iron were not produced. The rolling mill was unknown, and plates and strips had to be simply hammered out. Mounted on the inside of their lids were numerous spring bolts, all worked from one warded central key. Padlocks, too, were often used to secure them. In chests of this kind the goldsmiths of Lombard Street kept their bullion when in the reign of Charles II. London merchants first adopted the banking system. The foundation of the Bank of England in 1694 marks the commencement of a distinct epoch in the idea of credit that prevailed in England. This idea, permeating every branch of society, has developed with the country's increasing wealth, and is indicated by the present numerous joint-stock and private banks. Cast-iron safes and doors, easily fractured by concussion, were in vogue well into this century, but gave place to those made of rolled iron. This is now in its turn being displaced, the recent strides in the manufacture of that purer form of iron, called steel, having made it possible to substitute this more efficient and reliable material.

It is not my intention to describe in detail the requirements of a good safe, nor to weary you with the difference in quality of the various English makers. My purpose is rather to place before you some particulars of the latest developments here and in America. Despite our advanced civilisation, and the fact of lessening crime, the ingenuity of safe-makers has to be constantly at work to baffle the army of skilful scamps called burglars. Commencing with the productions of American makers, it is necessary to note that they draw a very sharp distinction between safes intended to withstand fire and those to resist burglars. Where a safe is wanted for both risks, a small burglar safe is usually fixed inside one of the other kinds. Anyone, with but little trouble, can force open an American fire safe, and the purchaser is perfectly aware of this. Whilst the outside is made of rolled iron or steel, the inner portion of the door, containing the lock and bolt work, as well as the rebating into which its numerous rebated edge shuts, is generally made of cast-iron. These castings are fairly tough, and are not brought through to the outside. The thickness between the inner and outer skins is filled up with materials selected for their non-conducting qualities. These are probably more various than those used for the same purpose in England, and include hard-setting cement concrete, which gives a certain amount of additional strength to the safe, compositions in a constant state of moisture, mixtures of dry plaster, asbestos and other finely divided materials. Some commercial salts are often added to the dry mixtures for the sake of the water of crystallisation which they contain, and which they give off in the form of aqueous vapour when heated in a fire. The Americans, as a rule, make their safes with a greater thickness of fireproofing than is done here, in order, I presume, to cope with increased risk. Added to this, they often introduce internal sheet-iron doors behind the main doors, entirely covering up the fittings of the safe, or else a layer of sheet-iron or prepared wood is fastened to the inside of the main door a little apart from it. Keyless combination locks are used in place of key locks to fasten the main bolts. These, having only one spindle, are operated by a revolving dial on the other face of the door, the edge of the dial being generally marked off into a hundred divisions. To open the lock the dial is revolved until the predetermined numbers to which the internal discs of the locks have been set are successively brought to a fixed mark. These discs or wheels, three or four of which are in each lock, are called tumblers—somewhat erroneously, in my opinion, for we have already seen what tumblers, whether falling pins or pivoted levers, really are. There is one variety of American combination lock that is a very interesting mechanical study, for its inventor has cut himself adrift completely from the past in designing it. As, however, it would take too long to describe it, I will simply refer you to the wall diagram, and to a sample of it on the table.

In American safes intended to resist burglars several thicknesses of steel of different degrees of hardness are employed, and all joints between the plates are carefully made and closed or covered with forged bands. To give extreme hardness so as to resist drilling, cast metal similar to Speigeleisen, and therefore capable of being chilled, is in some cases run in between the outer and inner plates of the safe. The strength of some of the United States safe deposit vaults is very great, resulting partly from the emulation of different owners as much as from necessity. One system recently introduced proposes to use solid blocks of chilled iron, grooved, keyed or bolted

together, not less than 10 inches thick. Upon the doors of other vaults a good deal of ingenuity is concentrated. One I recently saw in the country of big things is 8 inches thick. This was made not of cast-steel or iron, but of rolled plates of varying degrees of hardness, rivetted or bolted together. It measured about 7½ feet by 4 feet, and was hung upon crane hinges, shutting into its seating in the front of the vault with numerous rebates and three double grooves and tongues. The fit was so accurate that you could almost cut a sheet of paper between the meeting edges of the door and its surrounding frame. American practice adheres almost universally to the round bolt, made so as to revolve freely, with the idea of thereby frustrating any attempt to saw it through. The bolts are secured by two or more keyless combination locks, and by a chronometer lock, commonly called a "timer," which controls the bolts independently of the others. No doors of safe deposits, bank vaults or safes of importance are without "timers," and it is computed that there are not less than from fourteen to fifteen thousand in use. If a burglar, either by force or fraud, obtains the secret of the numbers of the combination locks, he cannot open the safe provided the "timer" be on guard. The owner, when closing his door for the night, sets his time-lock to run off guard at any hour he selects the following morning, say at nine o'clock, and at that time or after he can open the door. Timers are all capable of being set to run seventy-two hours, so as to go over Sundays, or, if necessary, from Saturday to Tuesday. To prevent the possibility of a lock-out, through the failure of springs or other accidents, modern timers have three distinct movements in them, any one of which is strong enough to run the lock off guard should the other two fail. One gentleman, Mr. Holmes, has contrived an ingenious electrical attachment to counteract the effects of a lock-out; another, Mr. Dalton, makes his timer work in conjunction with an auxiliary combination lock, which can only be brought into action when the timer stops. Here is a timer with three movements, which I hope presently to show you at work on the screen by powerful reflection. The existence of the timer, together with the popular reliance placed on it, has enabled the American manufacturers to meet a new method of attack. Discarding drills, blowpipes, gunpowder and other antique aids to their profession, burglars have within the last few years been studying the advantages of nitro-glycerine. To introduce it through the door they have pressed or wedged in the spindles, either of the locks or the bolt handles (English makers generally taper these the opposite way, viz. outwards). Though it is not possible to drive the spindle right in, enough space is obtained to inject the yellow fluid. Then, piling books and office furniture in front of the door, they await the blow-up. Of course, this method, involving as it does some noise, is not well adapted for city operations. What I am saying is not romance. It has been attempted sometimes successfully, at least twenty-five times. I should be very sorry to think that, by learning such facts as these, any English burglar might be induced to risk his life as well as his liberty, for it is not the duty of any safe-maker, with a well-ordered mind, to instruct thieves how to do their work. All I want to do is to show you how this has led up to a new application of the timer. You will see from this method of burglary it became desirable to do away with all spindle-holes through the door, and the problem was, then, how to work the main bolts. This has been solved by the use of powerful spiral springs, enclosed in a box mounted inside the door. One set of springs is for throwing the bolts, and there is another for retracting them. When the door is open the springs are wound up, or rather compressed, ready for action. From the nature of the mechanism it is impossible simply to wind up one set without the other. On closing the door, the first set throw out the bolts, either immediately by means of a contact trigger mechanism, or else by a small auxiliary time movement, and the door is locked for the night. The triple timer controls the second set of springs by means of catches, and at the appointed hour next morning releases these, and the main bolts automatically fly back. Thus ordinary locks are quite dispensed with, and reliance is wholly placed in the stored power of the springs, governed by the timer. This arrangement is sometimes applied in duplicate. It might be thought that the catches, being somewhat delicate, could be disarranged by external explosion, but this has been proved to the contrary by experiment. I have heard the objection raised that under this system the bolts, not being always held out by a rigid mechanism, may under certain circumstances be worked or pushed back; but in all work with any pretensions to good quality, it is just as difficult to get at the bolt-heads as it is to get through any other part of the safe, or its door. The fact that there are not less than two thousand of these automatic arrangements in use at the present day in the United States shows that they are entirely practical.

In England there is a large variety in the nature of the materials employed for the better class of safe-work. The object, as everyone knows, is to use a material which shall be sufficiently hard to resist drilling or other cutting instrument, and yet at the same time sufficiently tough so as not to become

fractured under percussion or pressure. To the system of running hard metal in between softer plates may be added that of case-hardening—that is, converting into steel the outer surfaces of iron plates of good quality, so largely done now with the working parts of machinery. Plates, or slabs, are also made up upon the model of war-ship's armour, *i.e.* with layers of high carbon steel welded and rolled in between layers of iron or mild steel. The high carbon steel gives the resistance necessary to keep out cutting instruments, the softer material contributing the toughness. Usually and preferably these layers are continuous, so that no part of the structure is unprotected; they are generally five in number, being either three of hard or two of soft, or *vice versa*. If made with two of hard and three of soft, the outer layer of hard steel is covered by one of the soft, but this does not interfere in the least degree with the efficiency of the hard steel, or modify the molecular change that takes place in it during the final chilling process. If, however, a hard steel face is desired, it is just as readily made as the other. It is the presence of carbon in steel which makes it hard, and steel with '6 per cent. of carbon in it is therefore more difficult to work than that with the usual percentage of '17 to '18. I mention this degree of carbon—'6 per cent.—because it is a kind of dividing line between steel that is easily worked and that which gives some difficulty, although not by any means insuperable, to hand tools. Safe-makers look with considerable interest upon the experiments of metallurgical experts in the production of steel alloys, so as to obtain a perfectly homogeneous plate, having the two properties of hardness and toughness sufficiently developed for their purposes.

In treating these armour-plates in the workshop I have applied special emery-wheel machinery, so as to produce exactly the sizes required after hardening, and thereby obviate the errors of fitting that are unavoidable if the plates be first planed in the ordinary way and subsequently hardened. I always dispense with jointing wherever it is possible to bend, or in any other way turn a corner; and these armour plates are as readily and as satisfactorily bent under the round-edge system of safe-making as if they were simply mild steel plates. Movable emery wheels are also applied to cleaning off the heads of composite rivets, and generally producing smooth and level surfaces where necessary.

Fastening the door into its frame has received considerable attention from all English safe-makers, resulting in bolts that claw, clutch, hook, screw, expand or interlace. Those shown on the diagram of the Chubb door do not shoot forward at right angles to the four sides, but move out at angles of 45 degrees; on each edge some go one way and some the other, thus pointing in opposite directions. By this method they form compound dovetails between the door and its frame, holding the two firmly together in case of attempted wedging. The diagram shows a door of somewhat unusual strength, the bolts being secured not only by double acting key locks, but also by keyless locks and a "timer."

It is often possible, in the lighter and weaker kinds of safes—safes, I mean, that can be opened with either a pickaxe or a sardine tin opener—to so "make them up" that they may deceive any but experts. This is done by giving the safe an appearance of constructional solidity it does not possess, by showing a thick front all round the door, the door itself seeming to be a plate of solid metal. In reality the appearance is produced by small packing bars, to which, on each side, are fastened sheets of iron no thicker than two folds of brown paper. The joints are filled or covered with "stopping," and careful painting—sometimes slightly scratched in order to produce an attractive idea of secondhandness in the minds of unwary customers—completes the semblance of a safe. It is easy enough to make these as heavy as the real things by using some weighty material for the fire-resisting (?) filling. What reliance can be placed upon them has been proved in many a fire, for amongst the *débris* of ruined walls one sees them lying about literally in pieces—their contents nowhere.

The safeguard against all this is of course to deal only with makers of standing and repute, who will say exactly how the safes of their various qualities are made, the thickness and material of the plates, &c. Even then it is not an easy task to make a selection, and the puzzled purchaser sometimes seeks professional and independent advice to decide between the rival claimants for his custom. Safe-makers are constantly being asked how long their safes will stand a fire, and how long they will resist burglars. To these queries it is almost impossible to give decided and definite answers. The more ready a maker is to give a guarantee that his safe is absolutely fire and thief-proof, the more cautious should a customer be in accepting the statement. Nothing is perfectly proof against fire and thieves, and the degree of protection obtained largely depends upon the sum of money expended.

Electric burglar-alarms are often used as adjuncts for security in many banks, the system employed being that in which a constant current is maintained, as distinct from the ordinary dwelling-house alarm, where the bell is only rung if

the circuit be completed instead of being broken. But it is not sufficient to insure the bell ringing simply if the wires be cut, for burglars with any knowledge of their business will join the wires outside the object protected, as as to leave the electrical circuit still complete. Hence a reliable system should give the alarm even if the wires be joined as well as cut. The little model I have here, of a strong-room door fitted up with such an alarm, illustrates this. By turning either of the keys or by breaking either of the wires, or by even joining the wires, the bell at a distance is rung. There is, therefore, a positive advantage in leaving the wires exposed, so as to invite tampering with them. Electricity may also be applied to other objects in connection with strong-room or safe-work, such as locking up gates at a distance, but it must always be borne in mind that wherever a constant current is used the batteries require periodical attention.

ELECTRIC LANTERNS.

IT may be interesting to many teachers in England to learn that a feature of the lectures upon architecture at the New York Museum of Art this winter has been the efficient working of the two electric lanterns used to throw upon the screens views illustrating the various subjects discussed. The plan of using two screens and two lanterns has proved a signal success, doing away with many slight delays in shifting the slides. In the comparison of architectural forms of any given period, with earlier or later examples, the twin screens were especially valuable.

Electric lanterns have been brought up to such a pitch of excellence, that any real and striking improvement attracts notice and wins special praise. The twin lanterns used to illustrate these lectures were of the most improved pattern, and had one feature whose excellence was proved by its effective working, and which has not been attached to any electric lantern until within the last three months. This feature is the setting of the carbons at an angle, with the lower one further toward the front of the lantern than the upper one. The wires were so connected that the arc leaped from the lower to the upper, bringing the luminous point upon the front side of the upper carbon, affording an unobstructed pathway for the light straight ahead out of the lantern. In other words, by setting the carbon pencils on a slant the carbons did not stand in their own light.

The good effect of this arrangement was seen in every picture projected upon the screen. The light was intense, and never shaded or wavering. This arrangement of the carbons was the idea of Mr. Alfred L. Simpson, formerly the vice-president of the Society of Amateur Photographers of New York, who has operated the electric lamps used to illustrate these museum lectures at the request of General Di Cesnola.

The lanterns themselves were of the latest pattern, consisting of the usual three parts—the lens frame at the front, the condenser frame in the middle, and the frame for the electric lamp or the oxy-hydrogen jet at the back. The various parts of the lantern could be adjusted for any sort of work, including that required by microscopy, and could be tipped up and down and sidewise with the greatest ease.

The electric current used was a continuous current of from 110 to 125 volts, the lamps passing about 12 amperes of current and 45 volts. Each lamp was supplied with a variable resistance coil, or rheostat, and a volt meter attached to the wooden standard of the lantern kept the operator continually informed as to the strength of the current that he was getting. The cost of the whole outfit, including the two lanterns, rheostats and volt meter, was about 600 dols. No equipment of the sort previously made has combined the idea of the tilted carbons, the special arrangement for drawing out the front of the lantern so far, with so great general adjustability and compactness. Mr. Simpson has been gratified by receiving personal congratulations upon his work by the trustees of the museum and from every lecturer of the season.

ARCHÆOLOGICAL SURVEY OF LANCASHIRE.

UNDER the auspices of the Society of Antiquaries and of the Lancashire and Cheshire Antiquarian Society, and with the assistance of antiquarians resident in the various localities, Mr. William Harrison of Manchester is compiling an archæological survey of the county. This will include a map on which the sites of the various ancient remains are indicated and a topographical index, arranged in alphabetical order, giving exact references to the local histories and to papers in transactions and periodicals respecting these antiquities. The introduction will give a chronological arrangement. The survey does not come down to a later period than the Conquest, although some doubtful remains, possibly of later date, are provisionally included. It will probably surprise many, says the *Manchester Guardian*, to know how numerous are the relics of antiquity recorded as on Lancashire soil.

Beginning with the misty and undefined pre-Roman period, there are no drift implements, but neolithic implements have been found at Aldingham, Barrow, Besom Hill (Oldham), Bleasdale, Bolton, Broughton-in-Furness, Bull Hill, Cartmel, Claughton, Crow Knoll (Oldham), Dalton, Dean, Dendron, Droylsden, Flixton, Furness, Goldshaw, Gleaston, Hawkshead, Haydock, Hopwood, Irlam, Kirkby Ireleth, Knowl Hill, Lancaster, Liverpool, Longridge, Manchester, Marton, Milnrow, Middle Hill, Newton-le-Willows, Oldham Orford, Pennington, Pendle Hill, Pilling Moss, Preston, Rampside, at many places in the extensive ancient parish of Rochdale, at Roosebeck, Royton Park, Salford Sharples, Silverdale, Stainton, Tatham, Todmorden, Tooter Hill, Turnshaw Hill, Ulverston, Wardle, Wavertree, Wegber, Woodlands and Wray. Neolithic floors have been found at Bull Hill, Tooter Hill, Knowl Hill, Middle Hill, Blackstone Edge and Readycon Dean. There are rock basins at Boulsworth Hill and Warcock Hill, near Burnley. Prehistoric interments are known at Aldingham, Allithwaite, Blackburn (Revidge), Bolton, Broughton (Manchester), Cark, Cartmel, Catlow, Cuerden, Extwistle, Grange, Hasty Knoll (Blackrod), Hawkshead, Kenyon, Kirkby Ireleth, Lancaster, Manchester, Over Darwen, Roose, Scales, Tong, Walmsley, Warton, Wavertree, Weeton, Winwick and Yealand. Canoes have been found at Martin Mere, Preston, Penwortham, Rufford and Barton (Stickens); British coins at Liverpool; and bronze implements at Aldingham, Calderbrook (Mow Road), Cartmel, Cuerdale, Dalton, Furness, Kenyon, Lancaster, Marton, Page Bank, Pilling Moss, Preston, Read, Rixton, Risley, Southworth, Sharples, Stainton, Tong, Wegber, Winmarleigh and Winwick. There are megalithic monuments at Birkrigg Common, Kirkby Moor, Warton and Turton.

We come now to the Roman period. The chief stations were at Manchester (Mancunium), Wigan (Coccium) Ribchester (Bremetonacum), Overborough (Galacum), and Lancaster (? Alone); whilst the Portus Setantiorum is believed to have been near Wyremouth. The minor stations were Walton-le-Dale, Kirkham, Burnley, Ringstones, Twist Castle and possibly at Blackrod, Castle Head, Castercliff, Downholland and Dalton. Temporary camps are set down as at Mellor, Langho, Portfield, Prestwich, Kersal and Walmsley. There was a dock at Carnforth, and according to Watkin, Botontini at Heapy, Langho, Preesal, Prestwich, Quarlton, Ulverston (Mountbarrow), Moat Hill (Warrington). (Arkholme, Melling, Hornby and Halton, which are claimed to be Saxon burhs, will be mentioned later under "Earthworks.") There are no villas, except perhaps one at Hornby. The cemeteries are at Manchester, Lancaster, Ribchester and Wigan, and a pottery at Lancaster. Roman coins and miscellaneous antiquities have been found at the many places named in Watkin's "Roman Lancashire," and also at Broughton (Manchester), Didsbury, Droylsden, Hawkshead, Oldham, Poulton-le-Fylde, Slences (Oldham), and Ulnes Walton. The authenticated Roman roads are:—(1) From Wilderspool, Cheshire, entering the county at Warrington, and proceeding by Wigan, Preston and Lancaster to the border of the county, and thence through Westmorland to Kendal and Carlisle; (2) Manchester to Wigan; (3) Manchester to Ribchester and Overborough, continued to Witley Castle, Cumberland; (4) Manchester to Slack, Yorkshire; (5) Manchester to Stockport, continued thence through Cheshire to Buxton; (6) Manchester to Kinderton and Chester, entering Cheshire a few miles from its commencement; (7) Ribchester to Kirkham, and thence (as is supposed) to the Portus Setantiorum; (8) Ribchester to Burwen Castle, near Skipton, Yorkshire, passing near Clitheroe and Downham; (9) Ribchester to Galgate, near Lancaster; (10) from the Lancaster and Kendal Road, near Carnforth, by Wyke, Flookburgh, Sandgate and Conishead (crossing the Kent and Leven Sands) to Dalton, and then crossing the Duddon Sands into Cumberland. The following additional roads will be marked as probable:—11, Manchester to Littleborough and Ilkley (with a reference to Blackstone Edge); 12, Blackrod to Mellor; 13, Blackrod to the Manchester-Wigan Road near Eccles; 14, Gorton Bridge (Salford), through Barton to Wilderspool; 15, Walkden to Barton-on-Irwell and Stretford; 16, Castercliff to Langho; 17, Portfield to Burnley, continued to Ringstones Camp; 18, Burnley, by the Long Causeway into Yorkshire; 19, Castercliff southwards towards Twist Castle and northwards through Colne; 20, Dalton to Ambleside by Satterthwaite; 21, Lancaster to Overborough; 22, Lancaster to Ivah, and perhaps further eastwards; 23, Kirkham to Elswick; 24, Melandra (Derbyshire), by Staley Street to Doctor Head (Yorkshire). The following roads are not proposed to be marked:—Downholland to Ditton (only supposed by Watkin), Dane's Pad at Pilling (probably Mediæval), Reddyshore Scout Gate (no certain traces of Roman work). Fragments of road will be mentioned in index under Brindle (Pepper Street), Dalton, Fleetwood, Hawkshead, Ulverston.

To the Anglo-Saxon period belong the sculptured stones found at Barton (Ship Canal), Bolton, Burnley, Halton, Heysham, Lancaster, Whalley and Winwick; the interments

at Claughton, Inskip and perhaps Langho. The burhs at Aldingham, Arkholme, Melling, Hornby, Halton, are included below under earthworks. Coins and miscellaneous antiquities of this period have been found at Cartmel (Castle Head), Chipping, Harkirke, Cuerdale, Halton, Lancaster, Liverpool, Manchester, Stalmine, Stretford (it is not certain that the Lancashire Stretford is referred to in this connection). The battlefields are Douglas, Maserfeld, Langho and Bruanburh—some of them matters of controversy.

In addition to the foregoing there are of course many remains of a miscellaneous character which cannot safely be assigned to any definite period. Among these are included the earthworks at Castercliff, Walmsley, Mellor and Campfield (Salford), supposed to have been Roman camps; that at Warton Crag, thought to have been a British camp; those at Arkholme, Halton, Hornby and Melling, which were set down by Watkin as Roman Botontini, but, like the Moat Hill at Aldingham, are now believed to have been Saxon burhs; the mounds at Heapy, Langho, Preesall, Prestwich, Quarlton and Ulverston, also set down as Roman Botontini, and mounds at Newton-le-Willows, Pennington and Chanderton, which are probably tumuli. There are, besides, traces of mounds or entrenchments at the Moat How (Carnforth), Rufford, Ince Blundell, West Derby and Woolton, and the dyke known as Nico Ditch. There are also numerous walled enclosures, cairns and structural remains of uncertain date, including walled enclosures with cairns, small camps, ramparts, cairns, tumuli unexcavated, bloomaries (*i.e.* ancient forges or smithies), ring mounds, sometimes termed stone circles (not, however, being megaliths) and foundations. These are mostly in the Furness district, but a few are noted in other parts of the county, particularly bloomaries, at several places in Rossendale and near Rochdale, and at Royton, while ancient habitations or other remains have been found at Penwortham, Pilling, Hardhorn, Stretford (the Great Stone) and Wigan.

The preparation of this archæological work has entailed a large amount of patient labour and much correspondence upon the compiler. It is desirable that all possible corrections and additions should be made before it assumes its permanent form. Any communications on the subject may be addressed to Mr. William Harrison, 112 Lansdowne Road, Didsbury.

THE SURVEYORS' INSTITUTION.

THE following student candidates have passed the examination for the professional associateship:—

Walter Ely Andrews, Ely Villa, St. Faith's Road, West Norwood, S.E.; Thomas Harrison Caffyn Bannister, Limehurst, Hayward's Heath, Sussex; Harry Greaves Bradshaw, 26 Demesne Road, Alexander Park, Manchester; Frederic Kersey Debenham, 80 Cheapside, E.C.; Edward William Eason,* 43 Bishopsgate Street Without, E.C.; Herbert Phillips Fletcher, Anglebay, West Hampstead, N.W.; Percy William Gray, 4 Arundel Villas, Station Road, Cambridge; Frederick Algernon Green, 28 and 29 St. Swithin's Lane, E.C.; Frederick Kirk Hawes, North Collingham, Newark, Notts.; Percy Cave Holiday, Bicester, Oxon; Archibald Wyndham Irvine, 10 St. George's Terrace, Gloucester Road, South Kensington, S.W.; Walter Nike King, 17 Akeman Street, Tring, Herts.; John Roy Lancaster, 28 and 29 St. Swithin's Lane, E.C.; Harry Edward Maddox, Milford House, John Street, Hampstead, N.W.; Frederick Charles Thomas Mann, 9 Malwood Road, Balham Hill, S.W.; Alfred John Martin,† 19 High Street, Chelmsford, Essex; Samuel Martin, Bolney Grange, Havelock Road, Croydon; Charles Edmund Neighbour, Fair View, Bradbourne Park Road, Sevenoaks, Kent; George Lloyd Pain, Silverdale Vicarage, Carnforth, Lancashire (Cirencester); Charles Bates Punchard, Underly Estate Office, Kirkby Lonsdale, Westmoreland; Joseph Townson Sly, 88 The Parade, Leamington Spa; Ernest Allen Stapledon, Lakenham, Northam, Bideford, Devon (Cirencester); Frederick Hubert, Thompson, The College of Agriculture, Downton, Wilts.

The following non-student candidates have also passed the examination for the professional associateship:—William John Almond, jun., 15 Brunswick Square, Camberwell, S.E.; Louis Hewitt Bailey, Blagrove Street, Reading, Berks; John Evans Bidwell, St. Mary's, Ely, Cambridgeshire; Joseph Harold Birley, Spring Bank, Pendleton, Manchester; Richard Elwyn Birch, Maes Elwy, St. Asaph, North Wales; Percy Morris Bodger, Cardington, Bedfordshire; Wm. Lobin Trant Brown, 32 Pembury Grove, Lower Clapton, N.E.; Reginald John Cox, 9 Albert Road, Brighton, Sussex; George Ernest Champion, Lyewood, Boughton Monchelsea, Maidstone, Kent; Alfred William Cooper, 10 Dingwall Road, East Croydon; Harry Vernon Darbishire, Oakdene, Cowden, Kent; George Willoughby David, The Hendre, Llandaff, Cardiff; Cyril Froodvale Davies, Froodvale, Llanwrda, South Wales (Cirencester); Frank Delamare, 34 Great George Street, S.W.; Walter John

* Institution Prizeman, 1893.

† Special Prize, 1893.

Easton,* 1 Colville Road, Bayswater, W.; John Edmonds, Bushby, near Leicester; Harry Charles Fitt, 7 Western Road, Brixton, S.W.; George Thompson Hewett, Puttenham, near Guildford, Surrey; Sydney Jeffree, Howard Lodge, Atkins Road, Clapham Park, S.W.; John Jenkinson,† Barrow, Broseley, Shropshire; Charles Arthur Kennett, Warrior Square Railway Station, St. Leonards-on-Sea; Charles Edmund Lart, 4 Upper Tichborne Street, Leicester; Cecil Wynn Marriott, Upham Rectory, Bishop's Waltham, Hants; Lewis Osler Mathews, 15 Waterloo Street, Birmingham; James Frederick Mellor, 110 St. James's Street, Brighton, Sussex; Henry Monson, 15 Palace Street, Buckingham Gate, S.W.; Daniel Morrison, 3 Old Palace Yard, S.W.; Gerald Donald Morrison, The Oaks, Reigate, Surrey; James Noel Norman, Dunkery Lodge, Putney, S.W.; Howard Parson, 24 St. George's Road, Beckenham; Fred. W. Pearce, 2 Avondale Villas, Haydon's Park Road, Wimbledon; John Thomas Pegge, The Guildhall, York; John Moeles Pyke-Nott, Waterloo House, Ely, Cambridgeshire; John Dougal Roney-Dougal, Estate Office, Ackham-in-Cleveland, Yorks; Arthur Reed Sale, The Grange, Botcherby, Carlisle; Sydney Saker, 3 Bank Buildings, Hastings, Sussex; George Farquharson Seddon, 4 Colinette Road, Putney, S.W.; Frank Braybrook Smith, 23 Brunswick Place, Cambridge; William Clowes Sows, Horsley, Leatherhead (Cirencester); Albert Henry Staley, 21 Coton Road, Nuneaton; Samuel Clifford Tee, 86 Grosvenor Road, Highbury New Park, N.; William Bott Tyler, 55 Lawford Road, Kentish Town, N.W.; Robert Edward Waldrum, 6 Manor Road, Leyton, E.; William James Watson, 13 Pembroke Square, Kensington, W.; Charles Henry Edward West, Fernville, Fortis Green, Finchley, N.; Edward Willis, 124 High Street, Eton, Bucks; Ernest William Malpas Wonnacott, 106 Lancaster Road, W.; Robert Garmondsway Wrightson, Hurworth-on-Tees, Darlington; John Walter Wyles, Melrose, Cambridge Park, Wanstead, Essex.

The following professional associates have passed the Fellowship Examination in Division IV.:—Benjamin Percy Abrams, 29 Abbey Road, St. John's Wood, N.W.; Frank Amos,‡ 1 Parade, Canterbury, Kent; Frederick Herbert Bancroft, Kay's Chambers, 26 Cooper Street, Manchester; Frederick Maurice Beadel, 97 Gresham Street, E.C.; Archibald Turner Bellingham, Dover's Green, Reigate, Surrey (Cirencester); Septimus Beven, 56 King Edward Road, South Hackney N.E. (Cirencester); Arthur Body, 15 Princess's Square, Plymouth, Devon; Ralph Hollinshed Brady, 17 Warren Street, Stockport; Alexander Burnett Brown, The Bays, Hampton Wick; Arthur Macdonald Brown, Tring, Herts; Sidney Crawford Buckland, Windsor, Berks; George William Cobham, 1 and 3 Edwin Street, Gravesend; John Thomas Crier, 2 Surreyville Gardens, Castelnau, Barnes; Frank Bridgewater Debenham, Cheshunt Park, Herts; Horace Bentley Debenham, Cheshunt Park, Herts; Benjamin Belgrove Franklin, Holly Walk, Luton, Beds; Alexander Goddard, Knighton Spinneys, Leicester (Cirencester); Frederick William Lawley, 165 Strand, W.C.; Henry John Leaning, 90 Grove Lane, Denmark Hill, S.E.; John Wilfrid Lee, Vestry Hall, Hampstead, N.W.; Jas. Henry Mellenfield, 45 Cazenove Road, Stoke Newington, N.; Henry Herbert Robinson, The Cottage, Heathfield Park, Willesden Green, N.W.; John Edward Tory, 29 Fleet Street, E.C.; Percival Fox Tuckett, 2 Basinghall Street, E.C.; James William Tyler, Elm Villa, Trinity Road, Upper Tooting, S.W.

The following candidate has passed the Direct Fellowship Examination in Division V.:—Henry Blackburn, 6 Queen Anne's Gate, S.W.

LEEDS ARCHITECTURAL SOCIETY.

THE seventeenth annual meeting of the Leeds and Yorkshire Architectural Society has just been held in the Law Institute, Albion Street, Leeds, Mr. G. B. Bulmer, F.R.I.B.A., president, in the chair. The report, which was read by the hon. secretary, Mr. W. Carby Hall, said that the society had continued to expand in membership, in the area from which the members were drawn, and in the usefulness of the work done. The Council had agreed with the Leeds Master Builders' Association upon a form of contract agreeable to both parties, but, learning from the Council of the Royal Institute of British Architects that a committee appointed by the Institute were in consultation with the Institute of Builders on the subject, and that it was hoped shortly to issue a form of contract which would be acceptable for use throughout the country, further action in the matter was postponed. The council had had under consideration the subject of unrestricted bill-posting in Leeds, and, after obtaining information on the matter from various Continental centres, a memorial had been presented to the Leeds County Council, in the hope that it would strengthen their hands in dealing with the question in the new Consolidation Bill. The Town Clerk, in reply, had thanked them on

behalf of the Council for the material they had supplied, stating that it would be of advantage to the Parliamentary Committee, and promising that the matter should have careful attention. A memorial had been sent from the Society to the Council of the Institute concerning the anomaly at present existing in the election of Fellows of the Institute, by which young architects of the age of thirty who had been in practice for seven years could present themselves for election, and so evade the examination, which was obligatory upon candidates for the Associateship. A memorial, generally signed by the members, was sent to the Leeds School Board last year with reference to the remuneration for professional services offered in the conditions of a competition for a new Board School. A deputation also waited upon the Board, but the Building Committee could not see their way to deviating from the course already laid down, and a large number of the competitors withdrew from the competition. The Council had under consideration a scheme promulgated by the Institute for the dividing of the United Kingdom into architectural provinces, for the promotion of architectural education by the systematic organisation of the various classes upon technical subjects. The Society now numbered 121 members—31 honorary members, 50 members and 40 Associates, as against a membership of 110 last year.

On the motion of Mr. W. Hall Thorp, seconded by Mr. W. H. Beevers, the report was adopted.

The following were elected the officers for the ensuing year:—President, Mr. G. B. Bulmer; vice-presidents, Mr. H. B. Buckley and Mr. J. H. Greeves; hon. treasurer, Mr. W. A. Hobson; hon. secretary, Mr. W. Carby Hall; hon. librarian, Mr. W. J. Mettam; members of Council, Messrs. W. H. Beevers, E. J. Dodgshun, F.R.I.B.A., G. F. Danby, A. Marshall (Otley), C. H. Thornton, W. Watson (Wakefield); auditors, Mr. F. W. Bedford and Mr. A. E. Kirk.

GENERAL.

Baron Nathaniel Rothschild has presented his château at Richeneau and grounds in the Styrian Alps to a society in Vienna, to be converted into a hospital for chest diseases.

The Bognor Local Board have decided that plans and specifications for new buildings are to be laid on the table in the board-room two or three days before they are formally submitted for approval.

Mr. J. Honeyman has been reappointed a governor of the Glasgow Technical College for a period of five years.

The Prix Duc, founded for the promotion of academic architecture, has been awarded to M. Camut for his reconstruction of the baths at Mont-Dore.

Mr. Thomas Stone, architect, died in London on Sunday in his fifty-seventh year.

The Bill promoted by the London and South-Western Railway Committee has been approved by the Committee of the House of Commons. It authorises, among other projects, the construction of a new graving dock at Southampton and the creation of 1,333,333*l.* additional share and loan capital.

M. Puvis de Chavannes has obtained a commission to paint decorative panels for one of the Boston libraries. The subjects were not prescribed to the artist.

Mr. F. Cherry, formerly a pupil of Mr. W. M. Mitchell, of Dublin, has obtained the second premium of 100*l.* offered by the Government of South Africa for a design for the new museum in Cape Town. There were twenty-four competitors.

A Letter was read at the Synod of the Presbyterian Church of England, held in Manchester on Wednesday, from Mrs. Lewis and Mrs. Gibson, of Cambridge, offering a site at Cambridge for a college and promising to bequeath a sum of 15,000*l.* towards the erection of buildings, in the event of the Synod deciding sooner or later to transfer the college from London to Cambridge.

The Plans prepared by Mr. John McKissack have been selected by the Glasgow Improvement Trustees, for the blocks of buildings which are to be erected at Osborne Street.

The Cardiff County Council have resolved that application be made to Lord Bute for acquiring the land lying between the county club and the north side of the intended post office, and the whole length of Park Street parallel with the point first started from Westgate Street, and that his lordship be asked at what price per acre he will be disposed to part with it for the erection of a public building.

The Great Fire at Messrs. Judd's Premises.—Those who are interested in fireproof construction may see a most remarkable proof of the utility of fireproof floors at Messrs. Judd's premises. The ground-floor of the main warehouse was constructed by Messrs. Homan & Rodgers, and not merely resisted the intense heat caused by the fire above and below, but now is actually intact and sustaining the *débris* of the four upper floors, printing machinery, walls, &c., piled to a height of some 30 feet.

* Driver Prize, 1893. † Consolation Prize given by President.

‡ Crawler Prize, 1893.

The Architect.

THE WEEK.

THE Manchester people do not believe in the proverb about the uselessness of examining the grinders of a gift horse. Sir JOHN GILBERT'S present of pictures to the city has not given general satisfaction. The London Corporation, it is said, obtained the best prizes, and, what is more hard to endure, Liverpool contrived to have the next chance of selection. What was left fell to Birmingham and Manchester. Sir JOHN GILBERT apparently had little to do with the distribution. Birmingham, on the other hand, is more than satisfied. At the meeting of the city council on Tuesday it was unanimously resolved to accept gratefully the most generous gift of Sir JOHN GILBERT, and the twenty-two works were declared to be a valuable and important addition to the permanent collection in the Art Gallery. It was also suggested that the artist should be made a freeman of Birmingham. Can it be that the gifts were judged by different standards in the two cities? Birmingham apparently perceives they can be utilised by students of art. It may be that in Manchester the interest for sightseers was the desired quality, and in that respect the works probably are less valuable than some of the recent purchases.

THE thirteenth annual report of the council of the City and Guilds of London Institute is satisfactory enough to gratify all who have an interest in "technical education" that will be deserving of the name. There is steady and continued, if not startling, development in all branches of the Institute's work. There was some increase in the students at the Central Institution, while at the last technological examination there were 8,534 candidates against 7,416 in the preceding year. The fees received at the Central Institution amounted to 4,821*l.*, at the Finsbury College 3,490*l.*, and at the South London School of Technical Art 127*l.*, while the corresponding expenditure was 12,511*l.*, 9,352*l.* and 1,266*l.* The technological classes and examinations throughout the country cost in addition 7,117*l.* It will be evident that every year involves the governors and council in responsibility for large sums of money. The balance reserved last year was only 1,825*l.* The art classes at Finsbury, it is said, show a very striking advance, particularly in figure painting, original designs in black and white and in modelling from the life, but Professor SYLVANUS THOMPSON does not hesitate to acknowledge that "the advance in quality, which is the gratifying feature of the year, is mainly due to the influence of two or three excellent students, who have been several sessions in constant and earnest attendance, and are now making a name for themselves and for the college that has trained them by the artistic qualities of their work." He says there is a distinct demand for the establishment of a special class for house-painters and decorators. Students are also eager to have the modelling studios open on additional nights. Mr. SPARKES is so fond of repeating his remarks about favourite students who have gained success, it is difficult to make out what has been the progress in the South London School of Technical Art; but the council inform us that "the work done at this school was fully up to the standard of previous years." The council may be congratulated on their success, and it would be well for the country if other promoters of technical education in Great Britain could point to results that are equally beneficial.

SOME members of the Arts Committee of the Liverpool Corporation visited London a couple of months ago to make applications to artists for the loan of pictures for the next autumn exhibition, and spent from nine to ten hours daily during twelve days (Sundays not excepted) in their task. They visited two hundred and forty studios. The circumstance suggests the efforts which have to be made to get together a collection for Liverpool. For the painters must be doubtful about the advantage that will arise to

them to repay their trouble and risks. The official report says:—"Some complaints were heard from constant and loyal supporters of the exhibition that they received no encouragement to contribute, from the fact that year after year their works were returned unsold." It has, however, to be admitted that the statements are undeniably true. The committee therefore implore persons of wealth and taste, who value the autumn exhibition as a means of spreading a love for art, to buy a picture during the season, and thus prove to artists that their pecuniary as well as their artistic reputation will be served by supporting the exhibition. The appeal has a good intention, but it sounds odd to find art going a-begging in that way in a city which is assumed to have some importance.

DAYLIGHT in Manchester is precious, and it is not easy to understand how building owners can have the hardihood to take away from their neighbours an infinitesimal portion of a commodity that is so rare. The Temple Chambers Company, Limited, having disregarded rights of the kind, are now in the disagreeable position of finding that they have erected their building too loftily. Opposite the company's new building in Mulberry Street was a chapel and presbytery. As the street is narrow and the chambers have many storeys, the priest's house was darkened. But as the company believed that the sun so arranged his course for their benefit as to deprive the priest of light for only two hours of a morning, they were indifferent to his inconvenience. What could a priest want with sunlight? As for diffused light, that of course was of no consequence, although the occupants of the presbytery were deprived of a half of their former allowance. The priest applied for an injunction, which has been heard in the Chancery of Lancashire. Mr. ROBINSON, Q.C., who presided, said there would be a sensible and appreciable loss of light in the plaintiffs' premises if the premises were allowed to be completed. He could not compel the plaintiffs to sell their legal right of light and the comfort and enjoyment which sprang from it for a money payment. He must in the exercise of his discretion grant an injunction restraining the defendants from further proceeding with the erection, and ordering them to pull down that part of their building which interfered with the plaintiffs' enjoyment of light and air. In view of an appeal, he suspended the mandatory part of the order till July 2. It is not easy to see how a case of the kind is to be settled, assuming that the defendants cannot have the decision reversed, unless by paying whatever is asked. The house cannot be sold apart from the church, and besides, it would not be easy to determine the loss from having a darkened light during services. The company's purposes, on the other hand, can only be served by a high building. The case is therefore complicated, and it is a pity more foresight was not exercised before the works were commenced.

A MEETING of the County Council of the North Riding of Yorkshire was held in Northallerton on Wednesday, when it was decided to rescind the resolution which was recently passed:—"That the plans of the new offices and a council chamber submitted by the Standing Joint Committee be approved, and that having regard to the numerous and rapidly increasing duties imposed upon the county council and its committees and officers, the county council are of opinion that the existing county buildings are both inconveniently situated and wholly inadequate for the due transaction of the county business; that the limited area of county land adjoining, if sufficient for a present addition, would be insufficient for any future addition to such buildings, and that it is unwise to expend any money in an attempt to enlarge or improve such buildings." The following resolution was adopted:—"That the present county buildings, with the land adjoining, afford ample space for providing all necessary accommodation for the transaction of county business, including that of Quarter Sessions and Council." It was also decided to consult an architect, and obtain plans showing what could be done with the Council's site.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

THE Chartered Accountants form a very modern corporation, but they have been wise to assert their influence by having a council-house erected which will bear comparison with many of the older guild-halls of London. Mr. BELCHER, by means of a capital sectional drawing, shows the council-chamber and library. A severe type of Italian with plain Tuscan columns has been adopted for the interior, but it is so treated as to become far more dignified than would be a later and less restrained style. The introduction of a large pictorial composition behind the chair enhances the effect. The Glasgow Athenæum, by Messrs. BURNET, SON & CAMPBELL, becomes remarkable by the towerlike division, which we suppose contains the staircase, and which is marked by vertical lines, like the tower in the Offices of the Clyde Trustees, by the same architects.

There are architects who find it is profitable to imitate Mr. WATERHOUSE's style, and examples of their adaptations may be found in the exhibition. His two drawings will therefore be closely studied. In both there is much vigour, one cause being the care that is taken with the vertical lines. The National Provincial Bank of England, Piccadilly, might be classed as Italian, but that must not be taken as implying that it is derived from any building in Italy. The arch has been avoided and the only curved lines are found in the pediments of the windows, which form a sort of attic. In the offices of the Refuge Assurance Company there is more restraint, but Mr. WATERHOUSE should know what is most suitable for a Manchester atmosphere. The "Banking Premises, Parliament Street," by Mr. HUNTLEY GORDON, was evidently designed with a view to secure attention for the building in a street where there are others to compete with it. There is a tower, surmounted by a statue of Justice; much surface-decoration and a bright terra-cotta is proposed for use. Messrs. T. M. LOCKWOOD & SON's banking premises in Chester has the advantage of a corner site, which is well utilised. The bank may be said to exemplify one kind of modern Renaissance, and it is of a form that suggests security. To design a building that will stand beside the fragment of INIGO JONES's Banqueting Hall is no easy task. The Royal United Service Institution, by Messrs. ASTON WEBB & INGRESS BELL, does not suggest that it was intended to surpass the older work. It is in a more modern but less architecturesque manner, and probably the dignity of the hall will be enhanced by the new building. Messrs. KIDNER & BERRY have an unpretentious bank at Daventry.

A foreigner can hardly fail to be astonished by the number of drawings of churches, church furniture and church decoration which appear in the Academy. Mr. UNSWORTH shows a fine screen of wood in Perpendicular style for St. Mary's, Horsell. In the interior of the new church, Staines, by Mr. FELLOWES PRYNNE, we see another type of screen, and we are glad to say it does not suggest an obstruction. The new chapel of the Cancer Hospital, by Mr. A. GRAHAM, could not easily be made more simple; the patients probably are not supposed to be in a mood to admire ornate work. Messrs. MORRIS & HUNTER, in their design for St. Andrew's, Ayr, reveal an admiration for Flamboyant details. Mr. E. T. HALL has an "extension" of a church at West Dulwich, which probably means the addition of a vestry; but in all such cases a plan should be given to define the new work. Mr. E. KIRBY's St. John's, High Leigh, Cheshire, does not depend on its height for interest, and the use of timber in the walls brings it into correspondence with the secular work of the district. We suppose Mr. SEDDING's experiment of employing an ultra-Roman church, with Roman equipments, has had the effect of deluding organ-grinders and their friends at Clerkenwell, and carried them under the influence of reformed doctrines, for in the new Church, Mission-house and Schools for Italian Protestants, Clerkenwell, the type adopted is also Italian, but Gothic. The church itself may recall to the strangers some buildings they have seen in their villages, but the convenience and completeness of the group must be strange to them. The church, house and schools at Bexhill-on-Sea, by Mr. P. H. TREE, do not form one of those stereo-

typed groups which are common. The main building is kept low, but from the size of the principal window the congregation cannot suffer from that dim, religious light which oculists and sentimentalists admire, and the number of flying buttresses without is a provision for light and shade, which nowadays is too often neglected. Mr. VACHER's design for St. Peter's, Abbeydale, represents a small Perpendicular church with a nave and two aisles, which is pleasing.

As Mr. J. O. SCOTT's design for organ-front, St. Mary Abbots, Kensington, appears in perspective it is not easy to judge of the elements which give character to the organ; but in a building which, by its extreme regularity and coldness, seems to symbolise the mechanical character of the age, the slightest effort at originality would appear reprehensive. The chancel of St. Peter's, Bushey Heath, by Mr. NEALE, appears in two views, and from the treatment we assume it is contemplated to raise some storeys hereafter on the chancel, which was made massive enough to sustain the weight.

The St. Joseph's Church, West Hartlepool, by Messrs. DUNN & HANSOM, is careful and unpretentious. The tower is not of excessive height, which is an advantage, for in Roman Catholic churches that part can rarely be completed. Mr. M. B. ADAMS's Pulpit, St. Michael's Church, Chiswick, deserves to be recommended for general adoption by manufacturers of church furniture, only it has too much variety and character to be turned out by a machine. It is small, and therefore not only does not occupy much space in a building, but there is no need for the expensive sculpture which is necessary with large pulpits. A crucifix and some delicate ornament in relief are introduced, but without them the pulpit would still be pleasing from its general form, and might be acquired for poorer churches. Messrs. CARPENTER & INGELOW, in their Tower and ante-Chapel at Hurstpierpoint, and Chapel at Abbots Bromley, are faithful to the traditions of the office, which are all in favour of extreme quietness and fidelity to precedent. In his St. Columba, Wanstead, Staffs, it is evident Mr. E. PRIOLEAU WARREN was compelled to deal with the problem of cheap churches and successfully. No doubt the interior is plain and the brick is not concealed in the chancel, but the forms are always satisfactory. The utilisation of one of the tie-beams of the roof to support a crucifix is in keeping with the general endeavour to respect tradition and economy at the same time, and to excite reverential feelings without much cost to the congregation.

Mr. JACKSON, A.R.A., has two views of the chapel and cloisters for St. Peter's College, Radley. The style is vigorous and truly Gothic in spirit, but without any indication of that mechanical reproduction of parts of certain Mediæval buildings which has helped to bring the style into disrepute. The view of the spire of St. Mary the Virgin at Oxford, is as convincing as Mr. JACKSON's letters about the groundlessness of the allegations of vandalism made by the Society for the Preservation of Ancient Buildings. Sir A. W. BLOMFIELD's Chapel, Selwyn College, Cambridge, has a window of a kind for which there are not many precedents; at the sides where one expects openings is solid masonry. St. Augustine's Church, Tonge Moor, by Mr. FREEMAN, looks on the drawing as if light was excluded; it also has a screen. Mr. JOHN BIGG has a careful exercise in design—a chapter-house in red brick. Mr. KEMPSON's St. Peter's, Pentre, seems to be rather clumsy in form; it has a square tower, and a small belfry breaks the long line of roofing. A small porch to Higham Church appears on a drawing by Mr. BERRY. St. Matthew's Church, Morningside, Edinburgh, by Mr. BLANC, suggests that the Pointed style signifies having sharp-pointed, piercing parts, which would be fatal to any birds that might alight on them. The drawing at first excites surprise, but the absence of vigour in the building soon becomes too apparent. Mr. PONTING's chancel aisle to Donhead St. Andrew's Church is low, with a battlemented cornice and stout buttresses, altogether superior to the nave. The interior of the Eglise Protestante in Soho Square is represented in Mr. ASTON WEBB's drawing, and from the benches to the roof we can see evidence of a desire to bring all parts into unity. For his church at Huyton Mr. CARÖE has preferred narrow lancet windows, and therefore could not adopt the free Perpendicular, with its breadth of window-openings, which is now in vogue.

The design for the cathedral at Victoria, British Columbia, by Mr. H. WILSON, is very bold and unconventional, but on that account it was probably considered as too difficult for any of the local builders to undertake. The west front of the Lucknow Cathedral, by Mr. W. EMERSON, is Gothic that appears to have a remote relationship to one of the numerous Indian varieties of building. Instead of a spire there are two towers, and a rose window is introduced over the entrance, the composition being on the whole attractive. The new town church, by Mr. LEONARD STOKES, is worth the attention of the clergy, for, although the exterior is impressive, there is an absence of the parts that are often oppressive by their cost.

According to VOLTAIRE, there is not much use in having VITRUVIUSES in a country unless there are also AUGUSTUSES to give them commissions ("c'est peu d'avoir des VITRUVES, il faut que les AUGUSTES les emploient"). In England Imperial works are so rare they may be reckoned as outside ordinary practice, but a new VITRUVIUS (assuming he could design as well as legislate about building) need not be afraid to venture among us, for plain citizens are ready occasionally to expend as much on a dwelling as a Roman emperor on a public building. That Domestic architecture still flourishes in England, in spite of financial embarrassments, is manifest from what is seen in the Architectural Room, for the majority of the drawings are views of houses—we might even say country-houses. It is among them also that we can find more traces of the influence of old English building than in the examples belonging to other sections. There is enough to demonstrate that Queen Anne, although less prominent in public than formerly, has not abdicated, and here and there something foreign may be discerned, but there can be little doubt that this year the old stately houses in masonry or brick, which are now accepted as examples of English Renaissance, and the developments of the English cottage which are known as half-timbered houses, were the sources from which most inspiration has been drawn. There is consequently more or less resemblance between many of the drawings; to point out the differences would need more space than is available, and would not perhaps be worth the labour.

The first in the catalogue is "A doctor's house in the country" (a vague sort of description, which should not be sanctioned), by Mr. E. B. LAMB. The bricks are of a dull muddy colour, and the woodwork is painted grey. The novelty of the combination of colours, we suppose, gained admission for the design rather than its architectural merit. MESSRS. WIMPERIS & ARBER, whose work is associated with Mayfair, in their additions to "Roxley" have adopted country fashions. The proposed house, based on Bramhall Hall, by Mr. R. A. BRIGGS, denotes the hold which the Cheshire district has taken on architects. It must be said the imitation looks rather stiff, and the abundance of quatrefoils hardly seems suitable to an age in which problems in practical geometry are taught in night-schools. The house 194 Queen's Gate, South Kensington, is very differently treated by Mr. BRIGGS. The union of convex and concave curves in the plan of the drawing-room windows is worth trying, and if the rustication appears a little too emphatic, it may be demanded by the character of the neighbouring houses. Mr. SUGDEN's "Woodcroft" may look better in substance than on paper; in the drawing the gables are curiously ungraceful. There is no escape from Ulster, even in the Academy. Mr. F. L. PEARSON has a most un-Irish house from "Lismoyne, near Belfast," for instead of being called a castle and appearing to express that "one only master grasps the whole domain," it is a cheerful English country-house of two storeys, built of red brick and hanging tiles. Another house of the English type at Coleraine is contributed by Mr. F. E. WARD. After seeing them, the Irish village at the World's Fair, Chicago, designed by Mr. L. M'DONNELL, with its castle and cottages (the latter suggesting warmth and comfort of which the peasantry are ignorant), cannot fail to set people thinking about the connection between architecture and the Irish question. The shops in Camden Town, on a corner site, by Mr. E. J. BENNETT, are better than ordinary buildings of the class.

Drawings of the entrance gateway and lodge, Welbeck Abbey, by Mr. JOHN BROCKE, and the entrance gate and

lodge, Eaton Hall, by Mr. R. W. EDIS, are placed together. The piers in the former are the more massive. They bear heraldic supporters, but are without lamps. The Eaton piers, which appear straitened in dimensions beside the others, are surmounted by vases which express nothing, and by lamps which are of use. They would serve as well for the boundary of a suburban building estate, or to mark the approach to a citizen's box at Enfield; the Welbeck gateway would be out of place in any other position. Banacre Edge, Witley, by Mr. B. CHAMPNEYS, is a pleasing example of country-house, the ground floor having bay windows. In Swan Buildings, E.C., a warehouse with a narrow frontage, the brickwork, of which there is little, is arranged herring-bone wise, and gives some variety to the building. "Compton Leigh," Hampstead, by Mr. NEALE, has an odd effect, as there is no visible means of ingress or egress except the windows. Mr. G. KENYON, in his small country-house, Yorks, has skilfully avoided monotony in planning. Mr. NEVE's "Goddington" is in the Cheshire style.

MESSRS. ERNEST GEORGE & PETO's drawings are among the earliest which are sought in each year's exhibition. The house in Delahay Street is T-shaped on plan, and in the angle a sort of turret is introduced. "Motcombe" is a large mansion of old English style. "West Dean, Chichester," is an interior showing a chimney-breast of solid masonry with pilasters (china maniacs may regret to see so fine an opportunity for the display of treasures wasted); the walls are panelled and there is a gallery. The "Villa" was designed for the Gaekwar of BARODA, and forms a most picturesque group with its open corridors, verandahs and dining pavilion. In Mr. G. C. HORSLEY's design for a country-house good use has been made of figure decoration, as there are panels of the seasons between the upper windows, and the gables are adorned in a similar style. Mr. UNSWORTH shows a long low house, partly with framed work, "Ashcroft." MESSRS. JAMES BROOKS & SON, instead of church work contribute a view of the South-Eastern Hotel, Deal, in which terra-cotta is ably utilised. Near it are houses by MESSRS. COX & COOKSEY, R. C. MURRAY, DAWBER, J. CLARKE, DOUGLAS & FORDHAM. Mr. ELY's "Entrance to Ashby Folville" might be mistaken for a view of old work. MESSRS. BEESTON & BURMESTER have four drawings of two important country-houses, which are handled in masterly style. There are also houses by MESSRS. JACKSON, A.R.A., W. T. WALKER, KIDNER & BERRY, HART, CARÖE, MITCHELL, B. SMITH, W. A. PITE, DYBALL, WORNUM, A. C. BLOMFIELD, STEVENSON, WATSON, GRAYSON & OULD, WILLINK & THICKNESSE, CUTLER, FLOCKHART, INCE, WILLOCK.

The most important of the hospital buildings is the New General Hospital, Birmingham, by Mr. W. HENMAN. That such a group will be an ornament to Birmingham is unquestionable, and it is to be hoped that there will have to be no sacrifice of any part. The London notion of stateliness is in such buildings happily avoided, for there is no flight of steps to torture "accidents" who are carried up them. The Royal Infirmary, by MESSRS. YOUNG & HALL, is also of an advanced character, for it resembles a group of agreeable country-houses. In St. Mary's Hospital, Paddington, MESSRS. SALTER & ADAMS have endeavoured to avoid the dismal appearance of so many London hospitals. The Seamen's Almshouses, Cowes, by MESSRS. CLARKE & MICKLETHWAITE, does not probably look as dreary as the drawing of a part suggests.

The examples of decoration are not numerous. Mr. AITCHISON, A.R.A., has only a part of a smoking-room, which suggests coolness and cleanliness by its whiteness. The aim of Mr. TEMPLE in his "Bath-Room," where tiles, mosaic and faïence are used, is excellent. The conventionalised plants would have a good effect, but the figure-panels would need to be in better style than is indicated. Mr. G. C. HORSLEY, in his design for the painted decoration of the roof of an university hall, introduces figures that are emblematic of the sciences. A river runs at their feet, and palm trees separate them. The designer suggests the manner of early Italian painters, which, it is needless to say, is refined and appropriate for such work. Mr. GWATKINS's designs for friezes are remarkable for their bold conventionalising of leaves. Mr. E. W. DAVIES's "Conflict" is a frieze in which athletes struggle with pythons on the ground. Mr. WESTLAKE's "Holy Women," part of a frieze,

is very careful, but the drapery seems to be derived from early German wood-carvings. Among the windows is one for Lowestoft by Messrs. HEATON, BUTLER & BAYNE, which is a model of skilful arrangement.

THE FUTURE OF ART.

IN his speech at the banquet of the Royal Academy the President said:—

The counting of graves is at all times an unwelcome and a painful task. Especially is it so on an occasion of which it is one object at least to honour the achievements of the living. It is, however, a task which loyalty to the memory of those who were themselves amongst the living when last we met lays imperatively upon the occupant of this chair, and from which those kindly references of the Prince of Wales in the earlier part of the evening do not absolve me. Within that period death has closed the record of three of the members of our body. The first to pass away was a sculptor of great and wide repute, whose hand made lasting in marble or in bronze the bodily image of not few of the most conspicuous Englishmen of his day—a man of high culture, whose active mind was not satisfied with one form only of outward energy, and seeking expression with the pen as well as with the chisel has attached to graceful poems the name of Thomas Woolner. After this votary of form, an artist was snatched from his many friends to whom light and colour were as the breath of life, and on whose canvases blaze the rich tones which his eyes had drunk in, no doubt, in the land of his birth—a land where brown streams are laced with gold, amid the heather's purple frame—for a Scot among Scotsmen was our lost friend Pettie. Last—but the other day, indeed—English landscape-painting lost in Vicat Cole one of its most conspicuous names. Typically English were the scenes on which he loved to dwell; the coppice, the glade, the rolling pasture fading from green to distant blue, summer slumbering on brown-tipped corn. But most of all our English Thames had won his heart and occupied his hands; he had followed its stream with faithful brush throughout its length, from where its first sweet gurgle is heard within the grass to where far away, salt and sullied, it rocks on turbid tides the carriers of the commerce of the world. By these three names, then, our art is poorer to-day. Meanwhile, as one generation fades away another presses forward to stand where it stood; the torch passes on from hand to hand, and those who, casting their gaze into the future, are keenly concerned to divine what shape that future will take and what rank it will hold, may see beyond doubt signs of much, if sometimes wayward and unchastened, vigour among the generation that is pressing to the front. And let me note in passing the legitimate gratification felt this year by our body, a body whose first function and duty lies in the training of the young, in view of the number of works of merit, both in sculpture and in painting, due to the hands of youths who either are still, or were but recently, among the enrolled students of the Royal Academy. But, gentlemen, looking from a wider standpoint at this exhibition, of which, it seems to me, the most carping critic could not challenge the comprehensive catholicity, and embracing further in the field of vision the many and manifold exhibitions, especially of painting, which each season brings forth, struck as all must be deeply with the vehement and almost feverish strife of conflicting theories and opinions which is rife about us, it is impossible not to feel strongly how perplexing such a condition of things must be to the very young, who, on the outer threshold of their career, eager and still malleable, seek a sure path in such a labyrinth of contradictions. Extreme youth when it is healthy is bold and fearless, and not a little inclined to rebel against tradition, however rooted in the long assent of men. And here, gentlemen, I would not be misunderstood. Steeped as I am to my inmost marrow in reverence for the mighty men of the past to whom art owes whatever of true sublimity it boasts, convinced unshakably of the vital validity of the great principles on which their achievements rest, I am yet not of those who would refuse to art all power of evolution, or who believe that, though assuredly it will never reach more lofty summits, it may not send forth lateral shoots fresh and delightful as only they are, indeed, nourished from the strong sap of the parent stem. In brief, I do not believe—to change the metaphor—that they who, in our time, have wedded their lives to art have clasped to their breasts a lovely but a lifeless corpse. To the very young, then, I would fain offer one or two matters for thought, if, perchance, they will hearken to one who has grown old in unwavering sympathy with their struggles and their doubts. I would beg them to keep ever before their eyes the vital truth that sincerity is the well-spring of all lasting achievement, and that no good thing ever took root in untruth or in self-deception. I would urge them to remember that if every excellent work is stamped with the personality of its author, no work can be enduring that is stamped with a bor-

rowed stamp, and that, therefore, their first duty is to see that the thoughts, the emotions, the impressions they fix on the canvas are in very truth their own thoughts, their own emotions, their own spontaneous impressions, and not those of others; for work that does not spring from the heart has no roots, and will of a certainty wither and perish. This other maxim also I would urge on them—that true genius knows no hurry, that patience is of its essence and thoroughness its constant mark; and, lastly, I would ask them to believe that the gathered experience of past ages is a precious heritage and not an irksome load, and that nothing will better fortify them for future and free development than the reverent and the loving study of the past.

RENAISSANCE AND GOTHIC ART.

THE prizes won during the past year by the students of the Nottingham Art School (which is directed by Mr. J. Harrison under the Corporation) were handed to them by Mr. Wyke Bayliss. In his address he said that in art, as in everything else, the chief question was, How was excellence to be attained? And when they thought of the great contests going on, not only there, but throughout the country in those schools of art, it was well sometimes for them to get away for a moment from themselves, to forget their narrow circle and to think of the larger arena and greater men in the long history of art in this world. Men engaged in art had been always striving for a prize—the prize of immortality, the prize of being leaders in the great army of art. They knew that the world had seen before their time two great periods of art—the Greek and the great schools of painting of Italy. He would not go so far back as to the records of Greece, but he would just for a moment ask them to think of one or two things in relation to the great school of painting that existed in the fifteenth and sixteenth centuries. He supposed there were none of them but would remember amongst all the splendid names that made Italian painting glorious, five names in particular that seemed glorious beyond the others. He would name them. There was Michel Angelo, there were Titian, Correggio and Leonardo da Vinci. He had named four; did they think he had forgotten the fifth, Raphael? There were other great painters, but those were supreme, and why? Michel Angelo was supreme, not because he was versatile, architect, poet, sculptor, painter; Michel Angelo was eternally supreme because he was supreme in one of the great elements of art, imagination. He had not time to tell them in detail—they probably knew all this, but what he wanted to do was to put these two or three things together, that they might think of them in relation to their own work. Michel Angelo was supreme in imagination and Titian was supreme as a colourist, as a master of the splendour of colour. Correggio was supreme because he was a master of the expression of the tenderness of womanhood and child-life, and Leonardo da Vinci was supreme because he was a master-scholar, an expert, the most learned painter that the world knew. Where was Raphael? Raphael was the equal of Michel Angelo in imagination, he was the equal of Titian, or not inferior in colour; he was as graceful as Correggio, as accomplished as Leonardo da Vinci—he was, in a word, an all-round man. And here was the great point for all to consider who had to carry out a great purpose in life. Let them aim to be perfect in one thing. Other things would come with it. They could do the work before them, and in doing it they would qualify themselves for doing greater work. He had named these men because their names were dear to them and stirred their hearts. They were painters pure and simple, and, speaking as an artist, and making art the purpose of his life, he had named these men to them, not with a view of persuading them to be amateur artists—that was not the purpose of these great schools of art. The great purpose of such schools was for them to do something specific, something definite, something that should be applied to decoration, something that should make their homes beautiful, and that should make their manufactures the glory of the world; and in doing that from amongst them the artists would come, because Englishmen were a race of artists. He asked them not to believe the abominable pessimism that was preached and taught in the supercilious press. Englishmen were a race of artists, and ought to do in art great things. Even though he would not weary them with a long discourse, he would just say a word in justification of the statement. The world, as he had said, had seen two great schools of art, the Greek and the Italian. But was there not another? Had there not been another creation of art, which stood side by side with the Greek? Did not Westminster Abbey, Lincoln Cathedral and Salisbury Cathedral, and the other splendid cathedrals of the country teach them something? Were not the magnificent Gothic buildings, the poems in stone, which made this land lovely, as beautiful, as splendid, as noble in art, as a Greek temple? They were, and he said this not merely to those who were present on that occasion, but always, and everywhere,

that the great period of Gothic art was as true, as great, as splendid a creation of art as the world had ever seen. What was the Gothic art, what were the Gothic splendours of their cathedrals?—English, English pure. As much as the name of the Parthenon was that of a Doric Greek temple, so the very name of its architecture was Early English. Greek art lived once and died, and never came to life again; but English art had lived and come to life again. What was the leading, what was the creative force which had made landscape art a glory in the world, but the work of English painters, such as Constable and Turner? And the painting of God's work in nature was as splendid as the painting of God's work in man. Not only in the splendour of landscape art, but even in the use of a material, what had the English done? They had created the art of the modern world—water-colour. So that he said they were a race of artists, and a splendid career was before them. What art could do for a nation was without limit in the splendour of its results. There was one condition only, and it was that the harp, the music, the art should be true, and it was for their schools of art to work out the truth that should awaken and strengthen and glorify the nation.

PUBLIC IMPROVEMENTS IN YORK.

THE following report, addressed to Mr. A. Creer, engineer has been forwarded to the Estates Committee of the York City Council. It is by Mr. Alfred Waterhouse, R.A. :—

In accordance with the request contained in your letter, that I should give the Corporation of York my professional opinion as to the best treatment of the vacant land at the corner of Blake Street and Duncombe Place, I, on Wednesday last, the 12th inst. (April), met the Estates Committee, and visited the site in question both before I met the committee and in their company.

I may say that it at once appeared obvious that nothing should be erected on the vacant site in any way to block out more of the view of the Minster from the corner of Museum Street and Blake Street than is blocked out by the Probate Registry Office at present. This would involve any new building on the site in question being kept behind a line drawn between the aforesaid street corner and the north corner of the Registry Office, and this restriction I understand to have been already insisted upon by the Little Blake Street commissioners. I would, however, go further than this, and restrict the height of any new buildings on this site—(1) to the height of the Registry Office, so far as they cover the site of 458 square yards on plan "A" accompanying report of Estates Committee to Council on November 9, 1892; and (2) if the new buildings were to be extended in a north-westerly direction towards the street, that then such extension should not rise above a line drawn from 5 feet above the pavement at the corner of Blake Street and Museum Street to the ridge of the Registry Offices. This restriction, which I would enforce, to prevent new buildings being obtrusively high near the corner of Blake Street, and so dwarfing the appearance of the Minster when it first comes into near view, is all that seems necessary on approaching from the railway station.

When, however, the question is considered from Blake Street, it assumes a very different complexion. The aspect of the Minster is so imposing from this point that I should suggest that no further obstruction should be put on the ground than is at present created by the Registry Office. In other words, that the north-west front of any future buildings should not project further than shown on plan "A" aforesaid. Even building on that restricted site would shut out the beautiful peep of the south transept now obtained behind the Registry Office.

In order to get an unobstructed view of the west front, the nave, central tower and upper part of the south transept, giving an architectural group perhaps unsurpassed in the world, the new Registry Office should, in my opinion, be removed, and its site, together with that now unoccupied at the corner of Blake Street, left entirely free from buildings.

I was able to get on the roof of the Assembly Rooms opposite the centre of unoccupied site, but not on to the higher roof adjoining. One would get from thence a very good notion of the general view of the Minster from the street below, and it might possibly be worth while having a photograph taken from thence.

To recapitulate :—(a) If the view of the Minster from Museum Street is only considered, then the line of the Little Blake Street Commissioners seems to me the right building line, the building to assume some such an outline as I have sketched, and to be restricted in height as I have before suggested. (b) It is, however, very desirable in my opinion to preserve as much of the view of the Minster as possible from Blake Street. This could best be done, the Registry Office buildings being where they are, by confining the new buildings to the site outlined on the plan "A" accompanying Estates Committee's report. (c) But I should strongly urge the Corporation

to consider the advisability of removing the Registry Office to another site, and not covering any of the ground at the corner of Blake Street and Duncombe Place, so as to open out the Minster more completely from Blake Street, and so secure a unique view of the noble building which must always remain the architectural glory of your city.

ARLES AND NIMES.

AT the last meeting of the Eastbourne Natural History Society, Dr. Habgood read a paper entitled "A Visit to Arles and Nimes, with special reference to the Archæology of the Neighbourhood." The lecturer gave a short sketch of the occupation of that part of France, embracing a period of from B.C. 154 to the fall of the Roman Empire in the fifth century. Arles was called "the Rome of Gaul," and on the fall of the Roman Empire became the capital of the kingdom of Arles. It is now a small town. Its antiquities are chiefly Roman, though many early Christian churches, now dismantled, are to be seen and in use as store-houses, shops and granaries. The theatre was seated for 10,000 spectators, and followed the Greek model in design, consisting of a semicircular part which contained the audience, and was filled with concentric seats ascending from the centre to the outside. The floor was semicircular, and was called the orchestra. The opposite or oblong part contained the actors; and within this was erected, in front of the audience, a wall, ornamented with columns and sculpture, called the scena. Only two of these columns are now standing, and they are of the Corinthian order. This building was elaborately decorated, and is said to have been demolished by the early Christian bishops, who regarded it as a focus of vice and idolatry. The amphitheatre, once capable of seating 25,000 people, is more damaged by human hands than by time. It differs from the theatre in being a completely circular building filled on all sides with ascending seats for spectators, and leaving the central space, the arena, for fights and public shows. It dates from B.C. 43. Three square watch-towers, added by the Saracens in the eighth century, still remain. The building was used at that time as a fortress. The cathedral church of St. Trophimus is celebrated for its twelfth-century doorway, which is decorated with figures of St. Trophimus, St. Stephen and the twelve Apostles. St. Trophimus first introduced Christianity into France.

The interior, which is mainly eleventh-century work, is bare and a striking contrast to its highly-decorated façade. The ancient cemetery, dating quite eighteen centuries ago, is of vast extent, and was originally divided into two parts, one for the Pagans and the other for the Christians. The ground teems with empty stone coffins and monuments, though the best have long since been removed to museums. A considerable portion of the cemetery is now used as a promenade, the coffins being neatly arranged on each side. Another portion is still in use as a modern burial-ground, the remainder being covered with railway workshops. Many chapels originally existed in this cemetery; the most curious, that of St. Honoratus, still remains and contains many empty coffins and heaps of human bones. About two miles from Arles is situated the Abbey of Mont Majeure, built in the eleventh century and well worthy a visit. Nimes was described as being about sixty-two miles north-west from Marseilles, and a clean and lively place—a great contrast to Arles in that respect. It is surrounded by open boulevards and is richer in well-preserved antiquities than any town in France. The Roman amphitheatre is 502 feet in diameter and 70 feet high. It is seated for 30,000 people, and is much better preserved than the Coliseum at Rome or the amphitheatre at Arles. Of date unknown, it is yet the most perfect example of its kind in the world. It consists of two arcades with sixty openings, between which are three-quarter columns with ornamental capitals supporting a continuous entablature. The Visigoths converted it into a fortress, and the Saracens used it as such in the eighth century. Down to the middle of the eighteenth century it was filled with mean hovels, all of which are now swept away. Fêtes and bull-fights are still held in it. The temple of Caius and Lucius, vulgarly called the "Maison Carrée," was built A.D. 4. It is a Corinthian temple and one of the most perfect and beautiful relics of Roman art in existence. Excavations made in 1822 prove it to be but the sanctuary of some great building, probably the forum of ancient Nimes. No building in Europe is valued more highly as a gem of ancient art than this interesting building. The grand vestibule supplied the original for the portico of St. Martin's-in-the-Fields and the Royal Exchange, London. The building has had a curious career. First it was a temple of the gods, then a Christian church, then the Town Hall of Nimes, a stable, a mausoleum, attached to a convent, and finally a museum of Roman and early Christian tombs, monuments and other relics. In building it the Romans followed somewhat closely the design of the temple of Minerva at Athens, substituting their favourite Corinthian columns for the Doric order of the Greeks. The lecturer also referred to the Roman gateway, the Roman baths

the Tourmagne, thought by some antiquarians to be a dismantled tomb, the cathedral church of St. Castor and the church of St. Paul. The paper was illustrated with diagrams and original views.

SYMBOLISM IN ART.

IN his third lecture on "Symbolism in Ceremonies, Customs and Art," delivered at the Royal Institution, Mr. John Macdonell, LL.D., said that in ethnological investigations there had been too great a tendency to overrate the purely intellectual significance of ceremonies, and to overlook their secondary value as excitements to emotion. The love of ceremonial for itself is enough to account for the continuance of many of them. The initiatory rites of the Australian and North-American Indians, whatever their origin, existed mainly to gratify the love of mystery and the delight in ritual for ritual's sake. Many burial customs with very different origins were now really pungent emotional stimulants. The secret of the persistence of the Greek mysteries was not the doctrine taught therein, for Lobeck had shown there was in effect none; the pageant and the festival were sufficient in themselves. Dancing, too, as Lucian's dialogue showed, had been a great element in ceremonial, grave no less than gay. It was a law of rites and ceremonies that, even if the form remained the same, the meaning changed—which the lecturer illustrated by references to sacrificial usages. Selden had spoken of ceremonies as cups or vessels for preserving principles, and the contents of the vessels varied from one generation to another. The lecturer, passing to symbolism in art, referred to idols as symbols beyond all others. In many cases so far was beauty from being essential to them that additional significance seemed to be given to them by positive uncouthness. Probably no masterpiece of a great artist had ever become associated with miraculous powers. Not the Sistine Madonna, but some poorly-executed picture has gathered about it the affection of the multitude. The lecturer described the symbolism in the art of the Middle Ages as the key to much of what was found in the "Bestiaries" or compilations describing the moral significance of different animals. The proneness to symbolism in the best minds of the Middle Ages was in some degree due to the imperfect state of music, the modern outlet for feelings which once turned into mysticism. Something in men was for the first time satisfied by the Masses of Palestrina. What significance in the fact that the ancient world, with its rudimentary homophonic music, was almost tuneless. What more momentous event than the fiat, after the jarring discords of the Middle Ages, "Let there be harmony." In spite of its formal symbolism Christian art had its triumphs, some of them too little known. Folded within the leaves of missals, psalters and gospels was in the illuminations a world of miniature pictures of ineffable delicacy, the work of men of like mind with those who raised the great Gothic cathedrals of Europe. Were it possible to gather these scattered treasures together there would be a universal exclamation of delight. The great artists of the Renaissance did not eschew symbolism. In Michel Angelo's decoration of the ceiling of the Sistine Chapel with its vast symbolism was unfolded a theory of history as comprehensive as any to be found before Bossuet's "Universal History." In the hands of inferior artists symbolism became insipid and tedious. The over-ingenious designs of Ripa and Alciat, once popular and esteemed, discouraged invention. In music there was a symbolical element—a larger element than in any other art, and an increasing one. Some artists would be, in spite of all canons to the contrary, thinkers, and would turn to symbolism. An intolerant application of the maxim, "Art for art's sake," would give, not the Greek art of Phidias, but the pseudo-Greek art of the boulevard. Where did symbolism begin and end? Just where the mystery of life began and ended.

TESSERÆ.

Miniature Painting.

IN tracing the origin of miniature painting, we are carried back to the earliest periods in which art in any form was known. For we are told that the ancient Egyptians were in the habit of adorning their papyri with miniature paintings of hieroglyphics, and Pliny tells us that a similar art was practised in the early days of Greece and Rome. And that it was still existing in the earlier periods of the Christian era is evidenced by the fact that there are still preserved two specimens at least of manuscript illuminations, probably of the fourth or fifth century—a fragment of a Virgil (which, although a fragment, contains fifty miniatures) in the Vatican, and a portion of a copy of Homer in the Ambrosian Library at Milan. But it was in the Middle Ages, from the eighth to the end of the fourteenth century, that this art reached its perfect development; for during that period, in nearly all the religious houses, the monks spent much time in its careful study, and in

the patient labour of illuminating their manuscripts of the sacred volumes and copies of the works of the classical authors. They were called illuminatori, and from the fact that the initial letter of a chapter or a paragraph was painted in red, the pigment for which was the Latin minium, or red lead, they acquired the name of miniatori, from which our word miniature is formed. Curiously enough, therefore, this word, which always conveys now the idea of smallness or minuteness, and which we have adopted as an adjective also to express the same idea, comes directly from a word which did not in any way indicate the size of the picture, but only the colour of the initial letter, which, with its ornamentation, furnished the border or frame in which the picture was set. It would be impossible to say too much in praise of the work of these "miniatori" of the Middle Ages. All over Europe, in Italy, France, Germany, the Low Countries, Spain and England, this beautiful art was assiduously studied and with wonderful results, and those who have seen the superb examples preserved in many collections of the manuscript illuminations of these old artists find it difficult to say in what country the finest were produced. And it is impossible to over-estimate, too, the value of this work in preserving and supplying valuable material for the development of the art of painting throughout the world. These little paintings, the result of earnest thought and patient, painstaking care in the cloister and the cell, furnished the "studies" for those great masterpieces on panel, on wall, and on canvas, which mark a golden age in the art of painting. With the invention of printing, miniature painting, in the form it had thus far taken, practically disappeared, and in modern times it has been confined almost entirely to the production of portraits. In this direction, too, it has played an important part in the history of art by teaching faithful accuracy of drawing and delicacy of expression, and serving at the same time more than any other department of painting to produce and preserve a succession of portraits more or less faithful of men and women noted in history.

The Sheltering of the Roman People.

According to the calculations of De la Malle and others the area of ancient Rome was five square miles and sixty-three acres. It seems hardly possible to estimate, on a comparison of the mode of life and social demands of the ancient Romans with those of populations nearer our own era, the numbers which might have been accommodated, according to the fashion of the time, within that area. We must make an allowance, no doubt, for the ordinary habits of outdoor life among the Romans, vast numbers of whom may be said to have dwelt in the circus, the theatre and the baths, and only to have slept in the miserable dark cabins they called their homes. It may be believed that during part at least of the year multitudes of the lowest class even slept in the open air, or under the shelter of colonnades, as in Naples. We are sometimes told indeed to look to this modern city for an example of the conditions of life in ancient Rome. But though at the present day the temperature of Rome is said to suffer less violent extremes than other places in Italy, the well-known passages in Horace, Livy and Dionysius do not allow us to question the great severity of the winter there in ancient times. Great allowance, however, is unquestionably to be made for the treatment of domestic slaves, who were huddled, we may believe, without reference to their comfort, or even their health, in the holes and corners of their masters' houses, often confined at night in the basements or vaults of the mansion, and particularly of the temples and public buildings. The vaults of a public building might hold a vast number of public slaves, but it may be questioned whether the service of the temples and basilicas of Rome required the attendance of so great a multitude. Indeed, the question of this density of inhabitation turns very much upon the numbers of the slave population—a problem of which no reliable solution has yet been found, and which the most careful of modern inquirers, M. Wallon, has prudently abstained from attempting. Some inquirers divide the population equally between the servile and the free, though all inclining apparently to a still higher ratio of slaves. Other writers, however, would reduce the proportion very much lower, and it would be difficult certainly to point to any known example of domestic slavery at all approaching to this extent. Generally, the Roman citizen, being himself fed almost gratuitously by the government, must have felt more sensibly than the modern the burden of servile mouths to be supplied at his own private expense.

Italian Renaissance.

Had the Renaissance of Italy died out on the introduction of the full-grown Italian style in the fifteenth century, it is probable neither our Elizabethan, nor the French or Spanish Renaissance styles would have existed, and that the various western nations must either have adhered to their respective Gothics or have taken at once to the full Italian. These offshoots of the Italian Renaissance stand at different distances behind the parent style in classic purity and grace of form and harmony of decoration, as well as in consistency and truth,

through the antique being less understood and felt in the north and west than in Italy, where the Gothic had not, nor could have, the powerful influence it had on this side of the Alps, or so strongly infuse itself into the current style. Indeed, in Italy there was no Gothic, properly so-called, so to infuse itself, the Italian Gothic, especially that of Venice, having little of the essential, aspiring spirit of the northern styles. In each country, too, what was derived from the Italian was greatly modified by peculiar national feeling, as well as by artistic disability and inferiority of resource. As the same seed falling on different soils must produce different fruit, so these Renaissance styles, though they had their source in the same parent style of Italy, soon widely diverged and became very dissimilar phases of art. Generally each showed the same predilections as regards form and proportions, as well as decoration, which had been exhibited by its Gothic predecessor, of which, at first, it was merely a reproduction in a new and classic dress.

Leonardo Da Vinci.

Leonardo's powers were too much for one man, or for one ordinary length of life; they trod on each other. With fewer gifts there would have been more results; with less ardour for science, more performance of art. His temperament also impeded his free course. He was fastidious, dreamy, impulsive, procrastinating and ambitious of shining in society. He saw before him summits of perfection higher than mind or hand could attain. He left what was good and certain for experiments after what he felt would be better. He studied everything in turn with utmost ardour, and he finished nothing he undertook. All people courted him, all crafts tempted him. Even in his art he was pulled in opposite directions—indeed, in all directions. His idea of our Lord's head is the loftiest that art has realised. His Apostles' heads are among the truest and noblest transcripts of nature. He attained in the countenances of his Madonnas and children an ineffable sweetness and pathos which breathe the very airs of heaven. At the same time he analysed the principles of all that is monstrous and misshapen in the human face, and in his caricatures, of the authenticity of which there is unhappily no doubt, he seems to have gloated over forms of wanton hideousness, half-human, half-brute, and all traced with an exquisite line from which we turn with repugnance. The temperament of Leonardo may be recognised by the very processes of his art. He altered and retouched without ceasing. His chief aim seems to have been not so much to complete a work as to retain the power of correcting and improving it. Thus he added coat to coat and film to film, ever deferring the end of his labours till a greater solidity and body of colour (*impasto*) gradually grew beneath his hand than any other painter before him has left. "Leonardo's refined taste and fastidious habits," says Sir Charles Eastlake, "may be traced in opposite effects, in untiring labour and causeless dissatisfaction." The wonder is not that he left so little, but that under the circumstances he should have left enough to establish the transcendent nature of his art. Indeed, there is nothing stranger in history than the fact of so great a reputation resting on so shattered and uncertain a basis, on one single work long reduced to a shadow, on at the most half a dozen pictures, for which, or for parts of which, his hand is alternately claimed and denied, and on unfinished fragments which he himself condemned. He was, properly speaking, the founder of the Italian process of oil-painting, but, the sacrifices he made to establish that process, however obvious to those who study him, can never be entirely computed. His very experiments on the nature of oil and varnishes can only be considered as misuse of precious time, and misapplication of an unrivalled hand. His observation of external nature and of her more hidden laws and forces was equally close, ardent and original. His social gifts and worldly qualities were irresistible, while as to the higher springs of action he seems to have been morally indifferent as to whether he talked and laughed, played and sang, painted and modelled, designed engines for the benefit of all time or invented toys for the amusement of an evening in the service of friend or foe, compatriot or foreigner. Of few men could so much that is psychologically interesting be said, and of few men of note is so little known.

Early Academies in England.

The earliest institution of a public character, a part of the plan of which was instruction in the arts of design, was the Museum Minervæ, established by Charles I. in 1635, the eleventh year of his reign, in the house of its first regent, Sir Francis Kingston, in Covent Garden. Walpole gives a slight account of it in the "Anecdotes of Painting," in the notice of Sir Balthazar Gerbier. The patent of its erection is still extant in the Office of the Rolls, and the rules, orders and plan of the establishment were printed in 1636, to which is prefixed a coat-of-arms granted to the regent and professors of the academy in 1635. It gave instruction in the arts, sciences and languages, in fortification, and even in riding; but none except such as could prove themselves to be gentlemen (that is, in position)

were admitted to study in it, in imitation probably of the exclusive law in force among the ancient Greeks after the time of Pamphilus, of Amphipolis, who established the famous school of Sicyon, which was that none but the free-born, or what is equivalent to it, the noble, should be allowed to practise the arts of design in Greece. As might be expected, the Museum Minervæ did not survive the Revolution. Previous to its establishment, says Walpole, a committee had been appointed in the House of Lords, of which the Duke of Buckingham was a member, for taking into consideration the state of the public schools and method of education. What progress it made is not known, but the Museum Minervæ, for gentlemen, was probably a part of its fruits; and with such a specimen of its liberality in the education of the public, we have no occasion to regret the suspension of the function of this committee. Sir Balthazar Gerbier established an academy of his own in 1648 upon similar principles at Bethnal Green, which he called "The Academy for Foreign Languages and all Noble Sciences and Exercises." Walpole mentions also an Academy of Painters, of which Sir Godfrey Kneller was the head, and at which Vertue, the engraver, studied in 1711. In 1724 another academy was opened in Covent Garden by Sir James Thornhill, which, however, did not rise above the rank of a private establishment. Sir James had before attempted, through Lord Halifax, to obtain the foundation of a Royal Academy of Painting, &c., but in vain. He had even designed a plan, and made an estimate of the expenses of a building suited for the purpose, and containing also apartments for the professors. His estimate amounted to 3,139*l*. In the year 1758 the Duke of Richmond opened a gallery of casts from the antique in Whitehall, forming an academy or gratuitous school of design for young artists, and he established premiums for the best design. This school was under the management of Cipriani for drawing and Wilton for sculpture or modelling, but, like its predecessors, its existence was of short duration, and its ultimate effect was in proportion, though probably to many young artists individually it was of considerable benefit. An advertisement notifying the opening of this gallery "for the use of those who study painting, sculpture and engraving" appeared in the *Chronicle* of February 25, 1758. Youths under the age of twelve were not admitted.

Saracenic Architecture.

The Saracen builders do not seem to have been possessed with an architectural idea; the leading consideration with them seems to have been not form but decoration. For the details of the decoration it is impossible to feel too much admiration. They are skilfully conceived and worked out with remarkable patience, honesty and artistic feeling. But the form, of which they are the clothing, seems too often to want purpose. There is a curious indefiniteness about the mosques, a want of crown and summit, which set them on a much lower level than the finest of our Gothic cathedrals. It is perhaps unfair to judge of them in their more or less ruinous state; yet their present picturesque decay is probably more effective than was the sumptuous gorgeousness of their colours and ornament when new. The want of bold relief in the ornament is one of the most salient defects to us of the north; the surfaces of the mosque exteriors will be found flat and monotonous. The disregard of symmetry is another very trying defect to the eyes trained in other schools of architecture; the windows, minarets, &c., are scattered with no sense of balance, and the dome, instead of crowning the whole edifice, covers a tomb at the side of the building, and thus infallibly gives it a lopsided aspect. It is chiefly to the grace of their minarets, the beauty of their internal decoration and the soft effects of the Egyptian atmosphere upon the yellowish stone of which they are built, that the mosques of Cairo owe their peculiar and indestructible charm. A charm they have undoubtedly, which is apparent and fascinating to most beholders; but it is due to tone and air, to association, to delicacy and ingenuity of detail, and not to the architectural form. Franz Pasha, the architect to the Khedive's Government, himself a fervent admirer of what is really excellent in Saracenic art, has the following criticism on the architecture:—While bestowing their full meed of praise on the wonderfully rich ornamentation and other details of Arabian architecture, one cannot help feeling that the style fails to give entire æsthetic satisfaction. Want of symmetry of plan, poverty of articulation, insufficiency of plastic decoration and an incongruous mingling of wood and stone are the imperfections which strike most northern critics. The architects, in fact, bestowed the whole of their attention on the decoration of surfaces, and down to the present day the Arabian artists have always displayed far greater ability in designing the most complicated ornaments and geometrical figures on plane surfaces than in the treatment and proportioning of masses. Although occasionally difficulties of construction are well overcome, as in the case of the interior of the Bab-en-Nasr, these instances seem rather to be successful experiments than the result of scientific workmanship. The real excellence of the Arabian architects lay in their skill in masking abrupt angles by the use of stalactites or brackets.

NOTES AND COMMENTS.

THE exhibition of paintings and sculpture which will be opened in Berlin, it is anticipated, will possess unusual interest. It will, in fact, be the inauguration of a new era, but whether of long or brief duration remains to be seen. Hitherto the exhibitions in Berlin were restricted to the works of the members of the local academy of art, with the exception of special years, such as 1891, when the exhibitions were international. This year the exhibits will not be drawn from one city or district. The Berlin Union of Artists, as well as the Berlin Academy and the various Düsseldorf unions, will be represented. There has been lately a split amongst the members of the principal Munich society, and the secessionists have resolved to do their utmost to gain success for the Berlin exhibition by contributing their latest works to it. A fine park is attached to the exhibition buildings, which is to be turned to account for supplementary entertainments, for even in cultured Berlin people get tired after gazing on pictures for an hour or two.

ABOUT thirty years ago the members of the Geologists' Association and their friends were entertained at a meeting in Cavendish Square by the dexterity of SIMPSON, or "Flint JACK," who, in the coolest and surest style, converted fragments of flints into arrow-heads with the aid of no other machinery than a small crooked rod of iron. In spite of his antecedents and the geologist's love of the genuine, he made a good deal of money during the evening, for his flint implements and barbed arrows were bought as quickly as he produced them at sixpence a piece. It was a strange scene, which even victims of the fellow's cleverness in turning out prehistoric objects could hardly fail to enjoy. According to a paper read the other night before the Glasgow Archaeological Society by Mr. JAMES NEILSON, that sort of industry, in common with others of a more honest sort, thrives in the North of Ireland. Mr. NEILSON related how, recently, on a visit to the Giant's Causeway, he purchased a number of flint arrow-heads. Everybody seemed to have a large number to dispose of, so he confined himself to a selection. Being rather suspicious, owing to the quantity for sale, he questioned the vendors, and gathered a good deal of information. With the exception of flint flakes and scrapers, he did not see a single genuine specimen. The spurious implements were made to resemble the genuine articles in such a way that it was sometimes impossible for an experienced eye to discover them, and even the best authorities were deceived. Mr. NEILSON believed that the traffic originated by the country people picking up genuine articles in the fields, and these found their way to museums and into the hands of archaeologists. As the demand increased the supply decreased and the prices rose. In this way modern manufacture stepped in and supplied the demand. After inquiry he found out a man who was said to be one of the principal manufacturers of "ancient" flint arrow-heads, and ultimately he succeeded in getting an interview. After conversation he offered to purchase several arrow-heads, but stipulated that they must be made in his presence. It was only after considerable pressure that the Irish Flint JACK consented to make a few arrow-heads, which were exhibited at the meeting. It would be well for collectors if imitative skill did not soar beyond the hazy prehistoric ages. Where is the museum which does not possess spurious antiques? If the original Flint JACK could be credited, specimens of his handiwork were to be seen in the British Museum itself, and as he used to remark with conscious pride, "very good things they were too."

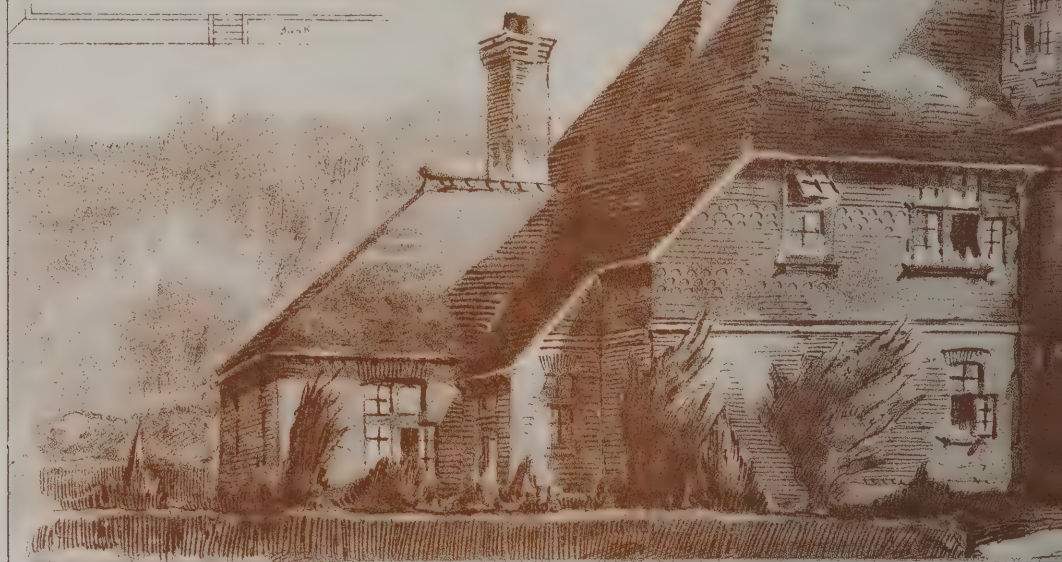
It is proposed to issue next month the first number of a quarterly magazine, which will be entitled *The Illustrated Archaeologist*. The editor will be Mr. J. ROMILLY ALLEN, whose competence is undoubted. As it is intended to avoid subjects which cannot be illustrated, the character of the essays may be imagined. The pages will deal with structures, monuments and portable objects left by man from past ages, ancient arts and industries; the fine arts of antiquity and the Middle Ages, anthropology, and folk-lore as far as the last relates to representable objects. Several antiquaries have promised to give their aid as contributors. Among them are the following architects:—Mr. C. LYNAM, Mr. LOFTUS BROCK, Mr. S. W. WILLIAMS, Mr. J. G. WALLER and Mr. C. B. FOWLER.

IN the last report by Mr. W. L. VERNON, the Government architect for New South Wales, he points out that, although the greater number of the public buildings are in a fair state of repair, yet there are many which, from one cause or another, have suffered much from neglect and absence of systematic repair, and in a few cases are absolutely ruinous. It is Mr. VERNON's opinion that the life of a building subject to the climatic influences of New South Wales is in many cases a comparatively short one, and unless frequent and periodical attention—particularly to outside repairs and protection from the ravages of the white ant—is systematically undertaken, a constant depreciation in the value of these buildings must ensue. Accordingly he suggests the advisability of greatly increasing the annual vote for "Repairs public buildings," even at the expense of projected new buildings, and the adoption of a system under which every building can be painted and repaired externally at least every fourth year.

THE suggestion of Sir SPENCER WELLS that a parish church should exemplify advanced principles of sanitation in order that they might be impressed on the minds of congregations, merits the attention of the clergy and churchwardens. There can be no doubt that attendance at services in many churches is more exhaustive to ordinary people than if they were engaged in manual labour during a similar number of hours. Why should stuffiness, like dimness of light, become associated with religious services? It may be said that the fault lies with architects and builders, but in the majority of cases they are not to blame. Clergymen have a fear of draughts, partly on their own account, partly for the sake of elderly ladies, and they imagine that ventilation is impossible without dangerous draughts, which is a delusion.

It is to be hoped the precedent set by the guardians of the Basford Union will not be generally followed unless it is intended to pay builders for their trouble in supplying the information. Casual wards are to be erected, and it is announced that "No tender will be received unless it is accompanied by a fully priced and monied-out copy of the quantities, containing every detail of expenditure upon which such tender is based, such quantities to remain the property of the guardians, and will be kept in the custody of the clerk." Payment on schedule rates has its advocates, but there must be a change in the system of tendering before it could be generally adopted. Hitherto, as all our readers know, the custom has been to expect a priced schedule from the successful contractor after his tender is accepted, and then only for the confidential use of the architect in squaring up accounts at the completion of the work. We cannot imagine that in this case the architect has approved of the innovation.

THE annual general meeting of the Liverpool Architectural Society was held on Monday. The annual report showed that the membership had increased from 115 to 125. The Council congratulated the Society on the result of the conference of architects recently held in Liverpool. It was hoped that before the beginning of another session they would have arranged with University College a system of education which would be beneficial to all young architects and students of architecture, and that the classes would be well attended. The following officers were elected:—President, Mr. H. HARTLEY; vice-presidents, Messrs. A. CULSHAW and H. W. KEEF; hon. librarian, Mr. J. L. BLAKEY; hon. treasurer, Mr. JAMES DOD. Mr. HARRISON, the retiring president, gave an address on climate and its effect on architecture. He said that the same climatic conditions which had so largely contributed to the original formation of races would always just as largely contribute to the modification of races by their wanderings, so as to make them stolid or reassuring, excitable or imaginative, passionate or phlegmatic, according to the amount of sunshine they enjoyed. The weather gave man his initial start as an architect, and it had continued and would continue to control his actions. Whether architecture was an art or profession, or whether the architect was born or made, he would always find himself to a very large extent subservient to climate.



House at Broxbourne. Sketches & Plan.

Carriage Drive View.

Messrs Newman & Newman,
Architects.



Residence at Moseley near Birmingham.
 for F. Brönnvall Esq.
 Essex. Nichol and Goodman Arch^{ts}. B^{ham}.







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May 5th 1893.



PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

GLoucester.

ILLUSTRATIONS.

HOUSE AT BROXBORNE.

THE house shown in the illustration was recently erected by Mr. J. A. HUNT, of Hoddesdon, from the designs of Messrs. NEWMAN & NEWMAN, F.R.I.B.A., of Tooley Street, London Bridge.

RESIDENCE AT MOSELEY, NEAR BIRMINGHAM.

THIS residence has recently been erected at the corner of Wake Green Road and Grove Avenue, Moseley, by Messrs. JAMES MOFFAT & SONS, contractors, from the designs and under the superintendence of Messrs. ESSEX, NICOL & GOODMAN, architects, of Birmingham and London. The buildings are faced with best pressed red bricks and Bath stone dressings, and are covered with brindled tiles.

THE NEW INN, GLOUCESTER.

THE ARCHITECTURAL ASSOCIATION.

THE eleventh ordinary meeting of the Architectural Association was held on Friday evening, Mr. H. O. Cresswell, President, in the chair.

Mr. H. W. Tomes was elected a member.

In connection with previous visits, votes of thanks were passed to Mr. E. W. Mountford, architect, and to Messrs. Holloway Bros., contractors; also to Mr. Aston Webb, Mr. J. Kelly and Rev. Father Vere, of St. Patrick's, Soho.

A visit for the following day, April 29, to the works of addition to the *Morning Post* offices, by permission of the President, was announced.

The lectures on painting, sculpture and allied arts, by Mr. C. Whall, Mr. Stirling Lee and Mr. Crace respectively, it was stated were open to any members who liked to attend them.

The soirée, it was announced, would take place on May 17. The House List, as proposed by the committee, was read, containing the names of Mr. E. W. Mountford as president, and of Mr. W. D. Caröe and Mr. Ernest Gale as vice-presidents.

Mr. P. GORDON SMITH then read the following paper on

Hygiene in its Application to the Arrangement of Buildings.

Mr. Gordon Smith said:—I have chosen the subject of hygiene in its application to the arrangement of buildings because it has fallen to my lot during the last twenty-five years to pay particular attention to, among other matters, the condition of the occupiers of a variety of different residential buildings in so far as that condition has been affected by the arrangement of the buildings in which they have resided. And I have had the opportunity of criticising the plans of many such buildings and of additions and alterations to already existing buildings, and I have also in many instances been able to observe the result, years afterwards, of arranging buildings in particular fashion. I have further had the benefit of association on nearly all occasions with medical colleagues who have assisted me with their special training and knowledge. Having had the advantage of such experience, it seemed to me when I was invited to give a lecture before the Architectural Association that I should best consult the wishes of the members if I endeavoured to lay before them some of the results of that experience.

It may be well at the outset that we should be reminded of some of the various ways in which a building may affect the health of those who have to occupy it, and in saying this I particularly wish to guard myself against being understood to imply that any of the defects to which I shall refer are themselves either the sole cause or the certain cause of the injury to health with which they are connected. It is probable that such evil results as do occur are brought about by a combination of conditions tending, during a longer or shorter period, to induce a state of health rendering the individual peculiarly susceptible to the particular disease that ultimately develops, and thus prepares the system to serve as a favourable soil for the progress of the disease. The arrangement of the building is one, and probably one of the most important factors in the causes of damage to health.

There appear to be three distinct sets of defects in a building which tend, in different ways and with different degrees of expedition, to bring about damage to health, and to foster, if they do not directly produce, conditions favourable to the development of certain specific diseases; thus what are most commonly spoken of and popularly understood as "sanitary defects" are probably the quickest to produce visible effect upon health, and are those which have been so aptly described as "filth diseases," and which convey, if they do not actually

cause, enteric fever, cholera, diarrhoea, and other disorders of the bowels produced mainly by excrement-poisoned air and water.

A second series of sanitary defects, entirely different and slower in their operation on the human subject than the last referred to, is that which tends to disorders of the bronchial type and to rheumatic complaints, to pneumonia, and in a great measure to phthisis and lung disease. This series is concerned with insufficient protection from extremes of temperature and from the effects of dampness and wet subsoil.

A third series of sanitary defects, and probably slower than either of the last, though undoubtedly not less certain in its effect, is the cause of a large amount of phthisis and other pulmonary diseases, of typhus fever and of ophthalmia, as well as affording a means of intensifying and spreading such zymotic diseases as smallpox, scarlet fever, &c., and likewise of encouraging depression and a tendency to mental complaints. These are more or less distinctly caused, or at any rate fostered, by insufficiency of air-space, overcrowding, excessive aggregation of persons in one enclosed atmosphere, deficiency of light and of sunshine.

It will be seen that the first of these three series of defects has to do mainly with drainage and water supply; the second relates chiefly to defective construction of walls, foundations and roofs; and the third to arrangement of buildings with regard to air supply and ventilation, light and distribution of occupiers.

It is this last-mentioned series of defects with which we are chiefly concerned on the present occasion. But I do not propose to occupy time by discussing the details of arrangement in regard to such matters as aspect and exposure to sunlight, air supply and ventilation.

That the influence which is exercised on the health of the inhabitants of a building by the particular arrangement of the building has, for upwards of thirty years, been recognised in regard to certain classes of building, will readily be admitted when we bear in mind that an ordinary hospital for a considerable number of patients is now always subdivided into separate blocks or pavilions, instead of being constructed in one single block of huge dimensions, as was formerly the case.

The sick, above all, need the best hygienic arrangements in order to insure and expedite their recovery, and wherever those arrangements do not exist, it is not difficult to detect the prejudicial effect upon the patients in the aggravation of their complaints, or the undue slowness of their recovery, and the tardiness of the healing of wounds, or possibly in graver indications or unwholesome conditions. We have all read, for example, of the difficulty of preserving the patients in a maternity hospital from the ravages of puerperal fever, and in surgical hospitals from the incursions of erysipelas.

Ever since the disastrous arrangements for the treatment of the sick and wounded troops in the Crimean campaign, 1853-55, the pavilion system of hospital construction has been accepted as possessing vast advantages over the older plan of arranging an unlimited number of patients in wards piled up several storeys in height, and often all round a quadrangle, as was the case in many old hospitals in all the countries of Europe. But even this pavilion system of construction, though undoubtedly right in principle, is now not infrequently terribly abused, as will presently be explained.

In hospitals for the reception of persons suffering from any of the infectious fevers, again, it is obvious that the hygienic arrangement of building has peculiar importance, since it is of the highest consequence that a patient admitted with any such infectious complaint must be so placed as not to risk contracting any other infectious disease during his stay in the hospital, and likewise so that a person sent there under erroneous diagnosis may be dealt with, with reasonable safety to himself as well as to other patients in the hospital. These special conditions obviously necessitate a special arrangement of building.

But it is not the sick alone who need peculiar hygienic arrangement in the building they occupy. Those who are reputed to be in proper health, both of body and mind, equally need care in regard to the arrangement of the building they occupy if their health is to be properly maintained, and wherever considerable numbers have to occupy the same building, as in an institution, the arrangement of building becomes a matter of vital importance.

Let us consider, for example, the subject of military barracks. The occupiers of these buildings are usually men in the prime of life, more or less in robust health, and selected after medical examination with due regard to their health conditions. And yet experience in the past has shown that unhealthy and badly-planned barracks have in time of peace killed or incapacitated the soldier to an extent almost equaling that of the most sanguinary wars. In our own army it was only after the Crimean War that public attention was directed to the subject. In 1857 it was found that, while the death-rate of the male civil population between the ages of twenty and forty years was 9·8 per 1,000, the mortality among the troops was

17'11, or nearly double. Subsequently an improved system of barrack construction was introduced which led to a considerable reduction in both the mortality rate, and the sickness of the troops; for whereas in 1857 the mortality among troops had been nearly double that of the male civil population of the same age, in 1876 the mortality among the troops had been reduced to nearly two per 1,000 less than that of the corresponding civil male population, and the hospital accommodation needed for troops has been diminished from 10 per cent. to 6 per cent.

In the French army, after the Franco-German war, similar improvements took place. M. Tollet writes that during the ten years ending 1882, France lost 40,000 men in the barracks, while some 60,000 men, who had entered the service in good health, were discharged on account of illness or infirmity. True, typhoid fever, consequent on bad drainage arrangements, was the cause of a large proportion (12,000) of the deaths, but that destructive lung disease, phthisis, appears to have been the main cause of this terrible loss. The success which has attended the improvement of barrack construction in our own country has been noted in certain other countries. In France particularly large improvements are being made. M. Tollet and M. Emil Trelat have paid high tribute to the work done in this direction in England, and both of them have urged on their own Government the extreme necessity for similar reforms in France. This is being gradually, though slowly, carried out, and M. Tollet has constructed several barracks arranged on improved principles under which the buildings comprise a number of one-storey detached blocks each to contain only a comparatively small number of men. In our own country the new barracks constructed under the Military Forces Localisation Act, 1872, comprise a number of wholly detached blocks, the residential blocks being restricted to two storeys, and holding some 80 to 120 men.

As with barracks, so with many other classes of building intended to hold a number of human beings. If we look at the modern prison we find the same subdivision into blocks or pavilions is now regarded as essential as in the case of an hospital. Wormwood Scrubbs Convict Prison is perhaps the best example of a recently-built prison in this country. It comprises four main pavilions and numerous smaller blocks, all detached one from another, affording accommodation, including hospital, for nearly 1,500 prisoners and a large staff of officers. A similar arrangement but with greater subdivision has been adopted in the new French prison at Nanterre, near Paris, which holds about 1,000 men and 500 women. These prisons afford a striking contrast as regards arrangement when compared with the prison of former days, such as Newgate and the Penitentiary at Millbank, or even the "model" prison at Pentonville in all of which aggregation of human beings in one block of buildings—in one enclosed atmosphere—was the common plan. In the still older prisons, which John Howard has so graphically described, it is certain that ignorance of the laws of health caused many of the prisoners to die, and a still larger number to be seriously crippled for life. Howard reports that "many of those who survive their long confinement are by it rendered incapable of working. Some of them by scorbutic distempers, others by their toes mortified or quite rotted from their feet, many instances of which I have seen." Howard made some valuable recommendations for obviating the defects of old prisons when a new prison was to be erected, one of these recommendations being far in advance of his time. He says, "That part of the building which is detached from the (surrounding) walls and contains the men-felons' ward may be . . . raised on arches that it may be more airy;" also "the infirmary or sick wards should be raised on arcades"—a plan which in recently-erected hospitals which I have seen both in France and Germany and to some extent in England, has been adopted for hygienic reasons.

In large modern workhouses it is customary to subdivide the buildings, even those for inmates in health, into separate blocks or pavilions, and to limit the number of paupers in each block to some moderate number, according to the class for whom it is intended.

And so, too, with regard to lunatic asylums, which are no longer arranged in one huge block of building, as at St. Luke's and at Bethlehem Hospitals, at Hanwell and Colney Hatch, but are invariably constructed in a series of more or less distinct blocks or pavilions, each to hold a certain moderate number of patients, and so that the sun in clear weather may shine between the blocks, and at some time during the twenty-four hours into all the rooms. For it has to be remembered that light and cheerfulness, which are so necessary for all, are specially useful in the treatment of all mental diseases.

Nor must it be supposed that the arrangement of building is of importance solely to buildings of the institution type. It will suffice here for me to point out that persons who reside in cottages arranged on the principle of what is known as back-to-back houses are peculiarly subject to prejudicial effect of the hygienic defects inherent to that system of house-construction. This is very clearly shown by the following table, which has been adapted from a report upon back-to-back house construc-

tion, which Dr. F. W. Barry and I prepared for the Local Government Board in 1888:—

No. of Registration Districts.	Population (1881)	Percentage of Back-to-back Houses.	Mean Annual Death-rate per 1,000 of the Population for Five Years, 1879-1883.				
			All Causes.	Principal Infectious Diseases.	Phthisis.	Other Pulmonary Diseases.	Diarrhea.
9	8,713	0	27.5	4.5	2.8	6.6	1.42
13	11,749	23	29.2	4.8	3.3	7.8	1.55
12	11,405	56	30.5	6.5	3.6	7.9	2.12
1	892	100	38.4	8.7	5.2	9.2	3.36

The districts referred to are certain of the 1881 census-enumeration districts, and it will be seen that as the percentage of back-to-back houses to total houses increases, so is there increase in the mortality rate from phthisis, in that from all causes, and likewise from certain other specified diseases. The importance of these rates is all the greater because, with the exception of the means of through ventilation, the back-to-back houses in the district in question were, as a whole, in a better sanitary state than the through houses.

I have thus far endeavoured to show that the health of the dwellers in sundry kinds of buildings depends to a great extent upon the arrangement of the building in which they live, or at any rate that the arrangement of building may influence their health conditions. In the case of general hospitals, as I have said, this is very generally recognised, since the conditions under which a patient may be maintained during his stay in hospital may either expedite or retard his cure and discharge. But if it be admitted that certain good hygienic arrangements of building are really useful for the sick, it can scarcely be denied that those same arrangements are at least desirable for those who are reputed to be in health, and might be useful as auxiliary means of maintaining a certain degree of healthiness. The value of the hospital arrangement of building or of some modification of it in the case of barracks, prisons, asylums and workhouses as an agent for the prevention of disease is, as I have shown, now very generally recognised; but I notice that very many residential institutions, intended to receive large numbers of persons reputed to be in health, are still frequently erected on an obsolete and defective plan. This is specially the case with charitable institutions of all kinds, and particularly so with institutions for the reception of children.

Nearly all institutions which depend for their very existence upon voluntary support are, more or less, crippled for want of funds, and their usefulness often leads those who have the management in their control to endeavour to do more than the available funds will permit to be done properly. Thus we find schemes are frequently promulgated for extending or rebuilding all sorts of institutions, such as orphanages, asylums for idiots, the blind, the deaf and dumb, waifs and strays, and all kinds of schools, in regard to which the chief aim of the promoters is to so enclose a building as to afford shelter to the largest possible number of individuals which the available money will permit.

Now for the class of institution to which I refer. There is, so far as I am aware, no code of rules for the guidance, in a hygienic sense, of those concerned. Hospitals have been written about almost *ad nauseam*; barracks are designed and built more or less directly under Government control. Lunatic asylums to a great extent follow hospitals, and come in for the criticism of a responsible department of Government. So too, do workhouse buildings of all kinds, and prisons are dealt with directly by Government. Public elementary schools again come in for official criticism, but residential schools (with the exception of those for pauper children) and charitable institutions of the kind generally are subject to practically no superior control whatever in regard to the arrangement of building. Nor is there much literature upon the subject. Schools, so far as education is concerned—that is to say, so far as regards the schoolrooms, class-rooms and conveniences—have been written about by the architect to that department, and an official paper bearing on the subject is issued by the department. The Association of Medical Officers of Schools have dealt with certain questions of school hygiene as concerning their own responsibilities; but, viewed as a whole, there is very little to assist either the architect or his client in all that concerns the arrangement of these institutions, and especially the residential institution of the class.

As a result of this absence of any definite principle in the arrangement of such buildings, we find all sorts of plans are adopted, some good, some indifferent, and some bad—very bad.

We accordingly find colleges and institutions intended as residential places for numbers of young persons reputed to be in good bodily health, though in some instances they may be

blind, or deaf and dumb, or of weak intellect, or more or less destitute or deprived of parental care, as orphans, arranged upon all sorts of plans, the residential rooms being arranged sometimes even over the domestic offices, round the four sides of a quadrangle, or in buildings several storeys high in the form on plan of the letter E or the letter H, and of a size intended to hold hundreds of persons.

The institutions to which I refer, being commonly intended for young persons, have, I think, taught lessons which the architect, among others, would do well to study. Poor-law institutions for children have needed, and have received, a very large amount of attention, and have been observed by many experts. The child may be regarded as a sensitive instrument which indicates very promptly and with much precision every variation of the health-conditions in which he is placed, and the experience of the large Poor Law schools is most instructive.

Some thirty or thirty-five years ago the objections to keeping the children in the workhouses, especially in the Metropolis, came to be recognised, and moreover the space they occupied began to be wanted for adults, and accordingly they were in many cases removed to separate school buildings, residential of course, on large open sites outside the towns, and arranged on what was considered the best plan. Notwithstanding, however, all the advantages under which these new institutions were placed, the result, after long and often very careful trial, was far from encouraging. Ophthalmia, diseases of the skin and scalp, and other troublesome disorders prevailed in these schools to an extraordinary extent, and in some instances seemed irremedial. Specialists were called in, enormous expense was incurred in medical advice and treatment, but with only partial or temporarily successful results. As regards ophthalmia, Mr. Nettleship, the eminent oculist, who was consulted in regard to all the metropolitan pauper schools, numbering many thousand children, has asserted that this disease "is the touchstone of the general healthiness of an institution," and he further remarks that "where many persons are herded together, their eyelids show sooner and more certainly than any other part if the conditions of vigorous health are not complied with." Dr. Mouat, again, who had wide experience in this class of institution, says "the stunted, impaired general health and feeble bodily powers of too many of these children are not removed or corrected by massing them together in large buildings or groups," and he points out that "there is a large and possibly increasing factor of imbecility, idiocy and nervous disorder generally, and some of the more immediate results of scrofula at the critical periods of life, which may be due to the insanitary conditions" inherent to the aggregation of large numbers of children in huge buildings.

It is this aggregation of human beings in vast buildings to which I wish to direct special attention. The evil results, due in a great measure to it, have been particularly noticed in Poor Law institutions, but those same evil results are not by any means unknown in other institutions. Ophthalmia has been found in them, though perhaps in a less aggravated form, and tendency to other disease is commonly experienced in them, but its severity is less, by reason probably of a variety of circumstances, such as the superior condition under which the children in those other institutions are reared before being sent to school, the periodical change the children enjoy in the three usual annual vacations, and so forth. These large institutions, with vast aggregations of children under the one roof and in the one atmosphere, have come to be regarded as a failure on hygienic grounds, and as with hospitals, subdivision of building with comparatively small groups of human beings is recognised as one of the chief means of maintaining a proper standard of health among the occupiers of the institution. So important is this arrangement of building regarded that it was determined a few years ago to cut up the huge main block of the Central London Schools at Hanwell. That building, originally designed to be partly three and partly four storeys high, with a length of frontage of some 650 feet, was, under the superintendence of Messrs. Henry Jarvis & Sons, the architects, subdivided into five distinct blocks. Gaps 16 feet wide and open from the ground upwards, were cut through the building in four places, so that the number of children accommodated in it was not only reduced, but the children were completely subdivided into comparatively small groups, and the whole arrangement became more assimilated in principle to that now commonly adopted in the construction of large hospitals.

This principle of subdivision of the children into small groups is by no means new. In Switzerland the family system of schools was introduced by Pestalozzi as long ago as about 1760; and the reformatory school at Mettray, in Belgium, on a similar system, has been in operation for about fifty years. In England there are several examples of the system which have been in existence for a long period, and the condition of the children in them has been carefully observed and noted. Some fifteen years ago the suitability of the home or cottage system of training and educating the children of the poor was the subject of an investigation by my then colleagues, Dr. Mouat

and Captain Bowly, R.E., and their report, which was subsequently published, shows that, while the system was generally adopted with the primary object of securing greater individual attention to the children for purposes of moral training and education, the hygienic advantages were very considerable indeed. And since the date of that report, as indeed before it in several instances (chiefly in South Wales), a considerable number of Poor Law schools on the cottage-home system have been built, and the result, so far as health is concerned, has been highly satisfactory. There are, as may be expected, many varieties of what is known as the cottage-home arrangement of school. Some would be more correctly described as on the separate block system, since the number of children in each "home" is large, there being in one or two instances as many as fifty children in each house, and in one, the Philanthropic Society's Farm School, near Redhill, even sixty, but the cottages at that institution are scattered over a very large estate of some 300 acres, and the school is a reformatory for boys who are all of an age greater than that of the children in ordinary schools and orphanages. The houses of the London Orphan Asylum at Watford hold fifty children each, as do also the "homes" in a few of the larger Poor Law schools on this system. The houses of the Little Boys' Homes at Farningham hold thirty children each, and so do those of the Birmingham Poor Law Cottage Homes, and some others. The Leicester Guardians adopted the excellent plan of building cottages for their pauper children on different scales, some holding sixteen children, some twenty, and some twenty-four children. In South Wales there are several Poor Law schools on this system, where the imitation of the natural family is approached more closely, the number of children in each cottage being only ten or twelve—a plan which obtains also in some excellent charitable institutions of the kind, such as Dr. Barnardo's Village Homes at Ilford, and the Princess Mary's Cottage Homes for Girls at Addlestone and others. This system of *segregation*, as distinguished from the common one of *aggregation*, is of the utmost hygienic importance where children are concerned. At some cottage-home schools a marked improvement in the health of the children has been noticed on their removal to them; thus, in Dr. Barnardo's thirty cottages it is reported in 1878:—"A great improvement in the general health and appearance of the children has taken place during the last twelve months, and this is attributed by the governor entirely to their removal from the building where they were formerly all housed together to the new cottages." And I am inclined to attach importance to it, not only in the domicile of the children as a whole, but in the individual rooms where they are assembled—in the dormitories, in their day and play-rooms, and especially in their school and class-rooms. The question of the number of children who may properly be assembled together for several hours in a schoolroom seems to have never been considered in its hygienic aspect, the main point recommended for attention in planning a schoolroom being (to quote from an official document) "to seat the children in the best manner for being taught." Mr. Nettleship, in noticing this tendency to aggregation of unlimited numbers of children in a large school where there was prevalence of ophthalmia, observes that hardly any attempt had been made to treat the children otherwise than collectively. In the official document already referred to it is pointed out generally that the observance of sanitary laws is as important in a school as in a hospital; hence it would seem reasonable to assume that children cannot be aggregated in a schoolroom with impunity any more than sick persons can safely be aggregated in a hospital ward. The comparatively short space of time at a stretch that children are kept in a schoolroom may cause the prejudicial effects to be less readily observed than in the case of patients continuously occupying a sick ward for several weeks; but that evil results ensue from massing large numbers together in schoolrooms must, I think, be admitted, and those evil results will be demonstrated with more or less rapidity, and will be intensified or diminished according to a variety of circumstances, such as the general health-condition of the children, the amount of floor-space and cubic-space allotted to each child, and the efficiency of the ventilation and the warming of the room.

In view of these considerations I look with no small anxiety at the enormous aggregation of children in many of our public elementary schools where they assemble, not only in large numbers in their several school and class-rooms, but where those rooms are piled up in several storeys and arranged so that in many instances the vitiated air is equally diffused throughout the entire building by means of the staircases and corridors. I cannot but think that in time to come these huge school buildings will be the subject of condemnation on account of their arrangement being found to be defective on hygienic grounds. Already the large increase of diphtheria that has taken place in England since elementary education became compulsory in 1870 is attributed in some measure to the association of children in vast numbers in the public elementary schools, and over and over again it has been ascertained that

the village school or the Board school has played the chief part in fostering and encouraging local epidemics.*

Hence if the aggregation of children is a source of evil in those day schools where the children assemble for a few hours only at a time, how much greater is likely to be the evil from similar aggregation where the children pass the whole twenty-four hours of every day in schools and orphanages of the residential type?

I referred at the commencement of my lecture to the way in which the pavilion system of hospital construction is occasionally abused. That system was introduced mainly, no doubt, to secure improved ventilation in the wards; but it also possessed the advantage of allowing the subdivision of the patients and of the more effectual classification of them, the surgical from the medical, and of grouping them with greater comfort to themselves and with greater efficiency, convenience and economy of nursing and administration. That the subdivision of the patients in a large hospital is of value as an important factor in the health-conditions of the institution will be admitted by every one who carefully studies the statistics and the mortality rates of hospitals. The late Dr. William Farr, of the statistical branch of the Registrar-General's department, says:—"The collection of a number of persons exceeding those of an ordinary family, under one roof, has hitherto had a tendency to increase the dangers of disease; for several diseases are, like fire and ferments, diffusible. The danger is increased when all the patients are sick, for their breath and excretions spread through the wards. The dangers, too, are likely to increase in a faster ratio than the numbers."† I wish to lay special stress upon this assertion of Dr. Farr's that the dangers of aggregation are "likely to increase in a faster ratio than the numbers of patients." As bearing on the same feature, I may remind you of what is said by Mr. Lawson Tait, the eminent surgeon, where, in his work on "Hospital Mortality," he contends that his statistics prove "that after the number of beds in a hospital exceeds 100, the risk to life becomes so much increased that it is questionable whether any hospital should be of larger size than this. If circumstances make it necessary that the hospital should be larger, most undoubtedly special arrangements and precautions should be taken to obviate the extra risk which is involved."

In view of these grave assertions of men whose experience and position entitles their opinions to much weight, it is indispensable to arrange a pavilion hospital in such a manner that the several pavilions shall be absolutely detached one from another, and so that the wards in every block should not intercommunicate with each other so as practically to have one atmosphere common to all of them, a point of importance, be it remembered, in a cottage hospital (where surgical and medical cases are received for treatment) as well as in other hospitals. This arrangement of complete separation of the several blocks or pavilions of a hospital is well understood by our friends in France, Germany and some other countries, where the pavilions in certain modern hospitals are placed at a distance apart without any other means of communication with each other and with the administrative offices than an open path or roadway; and moreover, the blocks are often only one storey high, and consequently contain only a very restricted number of patients. Now, if we look at the arrangements of our hospitals at home, we find a condition very different from what our foreign friends consider desirable. Which hospital shall we choose for examination? St. Thomas's Hospital is one of our most modern, erected at great cost, in a position where it claims the attention of foreigners, and competes in magnificence with the Palace of Legislature opposite to it. At this hospital we find huge wards piled up one upon another in four storeys, with a basement for stores, &c., beneath them, and dormitories for nurses and servants in an attic above them. Not only are these wards intimately connected with each other by spacious staircases from basement to attic, lifts for patients, lifts for coals, food, &c., and shoots for ashes and soiled linen, but as if there had

been a distinct intention to assimilate the air throughout the interior of the whole institution as much as possible and to counteract the effect of the "pavilion" system, the several pavilions, each holding some 112 patients, are connected together by enclosed corridors in the basement storey, in the ground storey and in the one-pair storey. So, too, at some of our best Poor Law infirmaries, the pavilions are joined together end to end instead of merely being kept separate and merely connected with the staircase by means of a short corridor. These arrangements are directly the reverse of what is aimed at in the best examples of modern hospital construction in France and Germany. At the great Friederichsheim Hospital at Berlin and at the Moabit Hospital, also at Berlin, at the Eppendorf Hospital at Hamburg, at the St. Denis Hospital near Paris, and others, the ward-blocks are absolutely detached, and at some, as the University Hospital at Heidelberg, the ward blocks are connected by a mere covered way open at the sides. No difficulty whatever is experienced in the administration of these hospitals, consequent upon the distance to be travelled in the open air from the nurses' quarters and kitchen offices to the several ward-blocks, and the hygienic advantage of complete separation of the patients into small groups is appreciated by the medical staff of those hospitals. This segregation of patients is carried to much greater length in the best modern foreign hospitals than in England, for, as a general rule, the ward-blocks rarely exceed one storey in height, and practically are never more than two storeys high, while the number of patients under one roof, or in one ward is much less than is the case in our English and Scotch hospitals. So, too, are the buildings spread over the site, so as to give a far larger area of site per bed than is customary in our own modern hospitals. At the great University Hospital at Halle, in Germany, the arrangement resembles a collection of small hospitals rather than one huge hospital like our own St. Thomas's Hospital.

Another hygienic arrangement common in continental hospitals is the plan of forming verandahs, balconies and even detached outbuildings or summer-houses, in which a large proportion of the patients are placed, while still in bed, practically in the open air, by night as well as by day, during some four or five summer months of the year, and I am assured by eminent surgeons and medical men that this arrangement is attended with great benefit to the patients. The plan is growing in England, and has been found in several instances in my own knowledge to be most beneficial. This plan of moving the patients out of the general wards during the summer affords the opportunity for allowing those wards of the hospital to be emptied for purposes of cleansing and sweetening; indeed, an eminent German physician once told me in Berlin of the hygienic value attaching to the arrangements of a hospital admitting of every ward being allowed to "lie fallow" for a period every year during which the window-sashes are removed and the interior exposed to wind and weather. This is in accordance with the experience of a fever hospital with which I am associated, where it has been found and recorded that after every time of purifying, whitening and painting the wards, the patients with scarlatina first received into them do better than those received into wards which have not been recently purified.

It is unnecessary for me to deal generally with the question of arrangement of domestic buildings in their hygienic aspect, since the need for ample means of light, access of sunshine and circulation of air about them must be well known to all. But there are one or two points about this class of building to which I must briefly refer. There are plenty of examples of blocks of so-called "model" dwellings in all our large towns which may be pointed to as "models" of what to avoid. In London we may easily find instances of blocks six and seven storeys high directly connected at right-angles, and even at acute angles, so that the sun (even when it does shine) can never reach many of the windows, and so that there is inevitable stagnation of air; or, again, that are arranged (as in the diagram) in streets—*culs de sac*—only 28 feet wide. These errors are common enough, owing to the absence of any sufficient controlling power, and though they are fully recognised by the architect and by the County Council too, they are nevertheless often committed under professional superintendence in order to comply with the client's demands for adequate if not excessive return for outlay.

In many of the earlier-built blocks of artisans' dwellings it was common enough to arrange them in such a manner that many families were aggregated together in the one enclosed atmosphere of a building many storeys high. These buildings were very disappointing in their wholesomeness, and the evidence given before the Royal Commission on the Housing of the Working-Classes, 1884, affords some suggestive information bearing upon this important question of hygiene in its application to the arrangement of buildings, while the density of population, in some instances reaching a rate of about 1,000 to the acre, was shown to be very high. The mortality rate in these huge blocks of artisans' dwellings is commonly higher than it ought to be, when it is borne in mind that the

* Dr. Thorne, in his "Progress of Preventive Medicine" (pp. 42 and 43) records that in an investigation he made into an outbreak of diphtheria in Essex, "the incidence of the disease upon children from three to twelve years old was about 50 per cent. greater upon those known to have attended school than upon the remainder." He also quotes from Mr. Power's report on an outbreak at Pirbright, "on four successive occasions while the village school was open well-marked diphtheria occurred among the scholars . . . and this although the school premises were free from recognisable sanitary defects, and although the school was not, after its first closure, reopened until the disease had seemed extinct in the parish and careful measures of disinfection had been used." Dr. Thorne further points out that the reopening of the school appeared on each of the four occasions to be responsible for giving a serious quality to the resulting diphtheria, and he adds that there are grounds for believing that the aggregation together of cases of diphtheria and of allied throat affections under circumstances such as those obtaining in elementary schools, constitutes one of the conditions under which a form of disease of particular potency for spread and for death may be, so to speak, manufactured.

† "Vital Statistics," p. 423.

tenants are to a large extent specially selected for their respectability and other good qualities. I do not imply that any system of selection is intentionally adopted by the landlord, but that in effect the tenants come to be sifted down, so to speak, to a picked set of respectable families, the average being more steady, sober and reputable than the average of the same class living elsewhere. Notwithstanding this advantage, the difference between the mortality rate in these block dwellings and in the whole Metropolis is often very small, and this, too, even in the rate of infant mortality. Thus, it has been stated that in a population of between 6,000 and 7,000 occupying upwards of a dozen different estates of block dwellings, the general death-rate was 15·6 per 1,000, while in the whole Metropolis it was 18·5 per 1,000; but in those same dwellings the rate of infant mortality was 140 per 1,000 births, or only six less than in the whole Metropolis, where the rate during the same period was 146 per 1,000 births, a difference in that most important matter which is so small as to leave much material for reflection and inquiry.

Closely akin to the subject of block-dwellings is that of common lodging-houses and so-called "refuges" for homeless persons. When it is borne in mind how the persons resorting nightly to these dwellings carry disease about and spread it all over the country, it will be admitted that improvement is desirable in the arrangement and other conditions of the buildings they inhabit. It has been noticed over and over again that where extensive works, such as railway construction, water conduit works, canal works, and the like, are in progress, and a large number of navvies have to be temporarily housed, various kinds of disease commonly break out among them, and are often spread from them over very wide areas. Now, if we look at the conditions under which these people are usually housed, we shall find them crowded together night after night in large numbers with the scantiest amount possible of space, cubic and superficial. The contractor's navvy is housed in a wooden hut, the lodger in the common lodging-house is crowded into an indifferently ventilated dwelling, and the houseless poor seek the shelter afforded either by the charitable or the parochial authorities in such refuges as are available, and there are many, but the hygienic arrangements of them generally leave much to be desired. They often hold some hundreds of lodgers, the dormitories having as many as fifty to seventy or more beds in them, and this in two or more storeys. These conditions are obviously not calculated to promote the health of the lodgers, but rather to foster and encourage any latent disease that may exist among them.

In my opinion it is most desirable that the building should be so arranged as to allow the large numbers received into such lodging-houses and refuges to be subdivided into small groups, the dormitories being severed as much as possible, aerially, one from another, and the number of lodgers in each reduced to a maximum of some twenty, unless the customary amount of superficial and cubic space to each lodger be largely increased.

It will be gathered from what I have said that great hygienic importance attaches, in my humble opinion, to such arrangement of building as will insure the segregation of human beings as far as practicable where they have to be collected together for special purposes, and it is because I have been led to this opinion by many years of observation that I venture to urge it as strongly as I do. I have noticed that, even quite recently, competition plans have been, or are to be, invited for large schools—in one case a day-school for some 1,200 children, and in another a residential school for some 700 boys, with an intimation that accommodation will be needed later on for about 500 girls—and so far as I have been able to gather the really important questions of the hygienic arrangement of buildings and of the disposition or grouping of the children for purposes of health are practically ignored, or are left to be determined on the lines that it has been the custom to follow for very many years, and which I venture to think ought to be regarded as obsolete.

I do not doubt that much may be said in favour of the present system of arrangement—the aggregation system I will call it—on the score of economy, but I am inclined to demur to a good deal that has been urged on this head. Time, however, does not allow of my going into the question of relative cost of the two systems on the present occasion. But I will conclude with the hope that the points I have urged may be helpful to the architect in the advice he may be called upon to give his client as to the best way, from a health point of view, of arranging the building he is commissioned to design.

Mr. H. D. SEARLES WOOD proposed a vote of thanks to Mr. Gordon Smith for his paper. The paper would be valuable, he thought, because it would strengthen the hands of architects in dealing with their clients by demonstrating the proper hygienic conditions to be secured; clients often have compelled their architects to do what was contrary to true hygienic principles. A common error of the public was to confound hygiene principles with sanitary matters only. There was need of

reform in factories, the state of which, as a rule, was unsatisfactory.

Mr. SAXON SNELL, jun., seconded the vote. Segregation instead of aggregation, all he thought would prefer, but unfortunately architects could not always have their own way. Miss Nightingale's advice to designers of hospitals was to take care that their buildings should not do harm to patients. Mr. Snell then alluded to the old story of persons counteracting the working of ventilating appliances and inlets for air by neglecting to keep them in order, stopping them up, &c., rendering useless all precautions taken by architects. In some cases, buildings in which hygienic principles had not been attended to proved satisfactory owing to cleanliness being a main point attended to by those in charge of them.

Mr. BERNARD DICKSEE said he was in favour of internal corridors for hospitals rather than having to go out in the open air.

Mr. BRODIE thought it was time people should know that hygiene was not confined to sanitary matters.

The PRESIDENT said Mr. Smith had alluded to the want of literature on this subject, and he considered no one was better qualified to supply this want than Mr. Smith. He then put the vote, which was carried by acclamation.

Mr. SMITH, in replying, said he had contributed articles to a magazine, the pith of which he had endeavoured to lay before them that evening. Mechanical ventilating arrangements were, he said, generally utter failures—at any rate, they should be used with great caution. The bridges at the Hanwell establishment, he explained, were emergency exits in case of fire, and not intended for administrative uses. Covered ways were not essential for conveying food from the kitchen to the buildings. It was an everyday experience in many institutions that joints, &c., could be served out hot without difficulty. Quadrangles, he said, might be objected to, but it should be remembered that where they existed, as at Oxford and Cambridge University colleges, the buildings were unoccupied for some months during the year, which made a great difference.

HISTORY AND DEVELOPMENT OF PATTERN DESIGNING IN TEXTILES.*

(Concluded from page 280.)

IN the same manner as in Spain, the Arabs exercised their industrial and artistic skill in the sea-girt Etnean island of Sicily. This grand era of textile industry did not commence until after the conquest of Sicily by the Normans. It bears the name at the present day of the "Saracenic-Sicilian" epoch of textile art, and a large number of splendid examples of this period are preserved in our churches and museums.

The Normans, in quest of booty and territory, took possession of Sicily in the eleventh century. After settling there, their kings conceived the idea of augmenting their power by developing the resources of the country. This idea was fully carried out by the best of the Norman kings, Roger II. (1101–84). He knew how to encourage the rearing of silkworms and the manufacture of silk, which was carried on in Sicily by Saracenic weavers. Of great importance to the development of silk manufacture in this country was King Roger's campaign to Albania, the present Greece. He led away captive all the men and women from Corinth, Thebes and Athens he could find who knew how to weave silks, and carried them to Palermo. He built dwellings for them, and compelled them to weave for him and to improve the silk industry. In order to insure the prosperity of the latter it was declared to be a royal monopoly. Mulberry trees were cultivated in all parts of Sicily, and silkworms were imported and reared with great perseverance to obtain raw silk.

An interesting royal silk factory was established at Palermo. This factory (the so-called Hotel de Tiraz) was in the royal palace, and owed its foundation to the Kelbij Amirs, who ruled Sicily, as vassals of the Fatimas, in the ninth and tenth centuries.

A writer of the twelfth century, Hugo Falcandus, draws the following picture of it in his description of Palermo:—

"It is impossible to pass over with silence the celebrated workshop adjoining the palace, in which silk is spun into different coloured threads, and these threads combined to form fabrics of several varieties. Here one can see stuffs made of single, double and threefold thread, which are less expensive, and require less skill than those made of sixfold thread, more raw silk being used for the more substantial materials. Fabrics are ornamented with a circular design, requiring for this reason great skill and a high price. There are also numerous ornamental patterns of various kinds and colours

* A paper by Herr Paul Schulze, Conservator of the Royal Textile Collection, and Lecturer on Art in the Royal Weaving School at Crefeld, read at a meeting of the Society of Arts and published in the *Journal*.

woven in gold and silk threads. To this class of goods the beautiful effect of the design is often illuminated by the brilliant flashing of precious stones."

Under King Roger's supervision, the Hotel de Tiraz maintained its special character and excellence of work. A silk manufacture sprang up from it, which not only answered King Roger's expectations with respect to the increased prosperity of his country, but also had its influence upon the whole of Italy, as the industry got a footing there also, and laid the foundation of the opulence and power which were to accrue to the towns of Central and Northern Italy. A great quantity of splendid types of Siculo-Arab work, in the twelfth century, enables us to form some conception of what manner of stuffs William of Palermo wished to speak of when he described the palace of Roger of Sicily:—

De drap de soie à or ou vres
A œuvres d'or et à peintures,
A maintes diverses figures
D'oïsiæ, de bestes, et de gens.
Les chambres furent par dedans
Peintes et bien enluminées.

Let us now examine the designs upon these fabrics made at Palermo by the Saracenic and Greek weavers. We find that they used the same patterns as in their native countries—symbolical animals, enclosed in large or small circles, in contact with one another or by polygons, just as in the Byzantine work.

In the Royal Textile Collection at Crefeld there is preserved a little fragment of the stola in which the bones of King Roger II. are enveloped in his tomb in Cephalo, near Palermo. It is quite possible that this splendid purple coloured fabric was manufactured at Byzantium and brought home by King Roger after his campaign against Emanuel of Constantinople (1147). Other samples of this period bear more distinctly the character of Saracenic fabrics. The designs upon them are composed of stripes in different colours, red, green, blue and white, with ornaments of gold threads. In the stripes we often see Arabian inscriptions. A rare fabric, which came from the church of St. Mary, at Danzig, shows an Arabian inscription, "assultan al alim," which means the wise Sultan.

At Ratisbon are two surplices which the German Emperor Henry VI. presented to the Ratisbon Cathedral. He inherited Sicily by his wife Constance, the heiress of the Norman crown. With this Emperor the vestments of the Norman kings, manufactured in the Hotel de Tiraz, and bearing Latin and Arabian inscriptions, passed into the possession of the German Imperial family, and until 1797 were the official robes of the emperors of the Holy Roman Empire of the German nation. The designs upon the two Ratisbon surplices are also striped in the same way as those already described. The Arabian inscriptions on these fabrics are very important. One of them means "Glory, victory, and long life." The other proves without doubt the origin and age of these materials. It runs:—"This holiday garment was made by Master Abdul Aziz, in his factory, for William II." This was a Norman king, reigning from 1166-89. Apart from royal robes, the most handsome stuffs were devoted to the manufacture of the dresses of honour which Mohammedan princes were pleased to bestow on those who had succeeded in winning their royal approbation. A welcome ambassador, the bringer of good news, a court favourite, a servant who had done something (or nothing) that pleased his master, would be so rewarded, the robe being appropriate to the rank of the person to be thus distinguished. To give the wrong dress would be like bestowing the Order of Saint Michael and Saint George on an Indian officer, or the C.I.E. on an Australian—as is said by Mr. Stanley Lane Poole in his clever book about the art of the Saracens in Egypt.

The ornamental use of letters is a characteristic of Islam art. Mohammed, in his intense eagerness to suppress the worship and making of idols, has repeatedly pronounced in the Koran a strict prohibition against making any images of created beings. He considered such acts to be an encroachment upon God's omnipotence. According to the words of the prophet, the creations of unbelievers in this world will mount upon their backs in the day of judgment, with horrible forms and distorted faces, and the unbelievers will be forced to bear this horrible burden for ever.

To compensate for the loss of figured patterns, the skilful Mussulman took a very sensible course in conveying, with the assistance of his letters, so well capable of this treatment, the ideas expressed in other styles by allegories and symbols. Thus we find the walls of mosques and palaces richly decorated with sentences from the Koran and holy books. Their woven goods also show the employment of letters in their designs. However, the subtle expounders of the Koran soon found a means of evading the strict letter of the law, and admitted a more lenient interpretation of it. After this only, naturalistic imitations of living creatures were considered unlawful, whilst a conventional treatment, which nearly represented the genus of the creature, as well as fantastic forms, which owed their

origin to the inventive minds of the Orientals, were permitted. The employment of Christians to weave such unorthodox designs as beasts and even human beings, however, was in itself a salve to the Moslem conscience; for the Christian weaver, and not the Mohammedan wearer, might be expected to receive the punishment. Similarly the prohibition against the weaving of silk dresses, which Mohammed considered should only be worn in heaven, was held not to extend to the use of silk fabrics with a linen warp; and the prohibition against the drinking of wine is to-day not referred to the drinking of champagne, because Mohammed, who did not yet know this noble drink, was unable to forbid it.

In the textile fabrics made by the Moors in Spain we can see abundant evidence of their strict avoidance of figure subjects. The Arabs, with their peculiar capacity for mathematics, preferred geometrical designs, and such composed only by ornaments and conventional flowers. These designs might be the precursors of the splendid pomegranate compositions on the velvet, silk and brocade stuffs which were manufactured in the fifteenth century in Northern Italy. We learn from various writers how important Moorish manufacture in Spain was from the tenth to the fifteenth century. The towns of Almeria, Granada, Cordova and Seville were particularly famous for their productions. In Seville 60,000 looms were said to have been active, whilst in another district nearly 3,000 localities were engaged in the art of weaving.

The combined work of the Greek weavers transported to Palermo by Roger and the Saracens introduced a new style of textile designs, which by the skilful combination of graceful line and floral ornament with figure-drawing, appreciated from the earliest times by Oriental taste, form the most interesting and attractive textile products of all ages. Elegantly-drawn tendrils form the groundwork, on which move slender and lithe-limbed animals. The Mussulmans coming over from Africa brought along with them a knowledge of the fauna of that vast continent: its giraffes, its antelopes, its gazelles, its lions and elephants; they knew the parrot of India and the hunting lion—the cheetahs—that were found in Asia, and when the stuff had to be wrought for European wear, imaged both beast and bird upon the web, at the same time that they wove a word of greeting in Arabic, to be read among the flowers. The Grecian newcomers brought fresh designs, which were adopted sometimes wholly, at others but in part, and mixed up with the Saracenic style. Human figures are plentifully interspersed; men, and more often maidens, hunting animals, are enclosed in characteristic surroundings, such as castles, shells and nets, like the bewitched princess in the contemporary fairy tales of the "Arabian Nights."

It is interesting to learn that these designs often have a symbolical meaning. For instance, a lion seizing a duck pursued by an eagle means that the possessor of this garment was valiant enough to snatch the booty from the claws of the eagle, the eagle signifying luck and riches; the lion, power and government.

From a pattern upon a piece of silk of the thirteenth century, showing a lion and hoopoe, it may be inferred that the fabric belonged to the robe of a strong and wise sovereign, since the hoopoe signifies wisdom. Moreover, a little inscription in the narrow border of the stuff says, "The Wise."

Another design shows a woman catching a hare with a net and holding by a chain or cord a hound and a spotted cheetah. Beneath this we see a woman with an eagle. From Arabian symbolism we learn from Professor Karabacek, in Vienna, that the catching of the hare signifies opulence, marriage and increase of family. To dream of riding on an eagle's back foretells riches, and if a person should see a woman carried on an eagle's back, he will eventually arrive at government.

Another design of that period, often used in Catholic churches, is the following:—Two stags, fastened with chains and turning their heads to heaven, kneel on a flowery ground, surrounded by large connected hexagons. Dewdrops and sunbeams fall from the disc of the sun, which is partially hidden by clouds, where two eagles are sitting. In this pattern the stag is supposed to be the symbol of the human soul, weary of life and yearning for delivery from its mortal body. We shall not be mistaken if we find in this interesting design a reference to the beautiful words of the forty-second Psalm, "As the hart panteth after the waterbrooks, so panteth my soul after thee, O God."

In another stuff a lion steps from the winged disc of the sun, holding in its claws a little animal. Another design shows a fountain, the structure being decorated with dragon heads from which hang scoops. Two girls carrying hares stand at the side of the fountain. Hounds and cheetahs lap the water flowing from the basin. Lastly may be mentioned an interesting design, woven in gold threads, in which we see alternate repetition of stars and a twisted ribbon bearing an Arabian inscription, above which a pigeon is flying underneath a large crown. We are thus able to discover a great number of interesting particulars in these fabrics.

But let us pursue the advancement of weaving in Europe.

Whilst at the Hotel de Tiraz at Palermo these splendid silk fabrics with gold thread designs, those magnificent velvets and those embroideries, bearing precious stones in gold settings, were being manufactured, we see at the end of the thirteenth century the towns of Italy enter into competition with Palermo, and thus especially as regards those towns in the north of Italy rising to great power and affluence.

Let us give our attention to the political situation at that time. I have already shown how the advancement made in textile production by some countries was due to political causes, and how artistic taste was affected by the same events.

The first town of the Italian continent to produce textiles of any importance was Lucca. It is mentioned in this connection in a manuscript so early as 1248. Manufacturing was carried on there to a large extent; the citizens despatched their products to Paris, Bruges and London. But commerce and industry were soon interrupted by civil wars of a sanguinary character. Owing to this cause many clever workmen quitted Lucca and settled in the neighbouring towns; Milan, Florence, Bologna, Venice and Genoa offered refuge to these fugitives and laid claim to their skill.

The many difficulties which had to be overcome in the introduction of this complicated industry, such as obtaining of raw material and the technicalities of weaving and dyeing, gave no opportunity at the commencement for the creation of new patterns. The draughtsmen of the Italian towns, like those of Sicily, seem to have thought themselves bound to follow the style hitherto in use, brought by the Saracens, of figuring parrots and peacocks, gazelles and cheetahs. Therefore it is difficult to say for certain to which place of manufacture the patterns of this period belong, and it is not until the middle of the fourteenth century that the differences in style appear more obvious owing to the advent of the new Italian ornament. It is true that the Italians used the Saracenic designs, but they paid no attention to their symbolical meanings; they thought it sufficient, by copying animal figures and borders bearing inscriptions and floral ornaments, to imitate similar designs upon the Saracenic weavings, which were valued so highly at that time. They would take a group of animals at random, surround it with secondary ornamental work and add to this examples of their own style of ornament. Thus we see animals and plants mingled together with fantastic forms, cartouches, scutcheons, crowns, castles, fences, fluttering ribbons and so forth. In some cases the designs upon the Italian fabrics of the fourteenth century also admit of a symbolical interpretation.

That brilliant fabrics, with their splendid and interesting designs, influenced the poetical art of that time and the songs of the German minstrels is proved by the fact that in the lay of the Nibelungs the description of splendid garments occupies the seventh part of it. In the *epopee Parzival*, by Wolfram Eschenbach, there are high-flown descriptions of a great number of delightfully patterned weavings, with details of their names and origin.

But, on the other hand, songs and legends have also given inspiration for interesting designs. One pattern shows a maiden standing on the battlement of a castle, and holding with her hand a falcon endeavouring to fly. In another pattern we see a maiden coming out of a large flower, on her hand a falcon with bells on its feet, and by her side a dog fastened with a cord.

In the further development of textile designs the slender and graceful tendrils were converted into knotty branches forming a pointed oval, in the middle of which was placed a group of animals in the Saracenic style. The characteristic ornament of the fifteenth century, the pomegranate, is made to sprout out from one of the angles formed by the contact of the branches. At first the pomegranate is small, and takes a subordinated position, the animal figures being predominant, but later on the size of the pomegranate is increased, and that of the animals diminished more and more.

Before we turn to the fully-developed pomegranate-pattern of the fifteenth century, another class of patterns, belonging to the end of the fourteenth century, may be discussed. Here, again, we have those slender, elegant tendrils, with little leaves covering with profuse growth the ground of the material, and often mingled with little birds, hares, dogs, leopards, stags, elephants, dragons, camels, &c. Owing to the influence of the Gothic style, the round arched leaves gradually disappeared, and the vine-leaf and bunches of grapes often appear as a characteristic floral ornament of this epoch.

At the end of the fourteenth century animal figures disappeared totally from design, and the pomegranate was transformed into the imposing pattern which, during the end of the fourteenth, the whole of the fifteenth, and the first quarter of the sixteenth century was a prominent feature. It is composed of a fruit like ananas or pineapple, placed in a cluster of leaves, from which flowers and leaves are sprouting, the whole being surrounded by ornaments of different kinds. The arrangement is the same in all patterns. The pomegranate is placed

in the centre, as a symbol of Christian love, and is surrounded by blossoms and fruit, the whole being symbolically interpreted to mean that love, by the aid of faith, brings forth the fruit of everlasting life. The rose, with five, six or nine leaves, which surrounds the pineapple, is surmounted by crowns—the reward which charity receives in Paradise. The thorny branches, plaited together, tell us of the crown of thorns, and remind us that only by pain and struggle is the victory gained which brings the crown of eternal life.

A very interesting development of the pomegranate pattern appears about the end of the fifteenth century. Broad ornamented stems take an undulating, upward course, and on either side branches bearing blossoms, leaves and little pomegranates are disposed. They were the fashion of the Burgundian court in the latter part of the fifteenth century, where the use of an immense mass of material made the employment of these gigantic patterns possible. In the patterns of this time we see ladies dressed in robes of many folds, and with a long train which was looped up and carried on the arm. The noblemen of the court of Charles the Bold were dressed in large gowns, which, on account of their extravagant length, fell to the ground in folds. Even the saints, the figures of biblical history, were represented by the artists of those times as being dressed in the rich velvets and brocades of the Burgundian period. In the large altar picture in the cathedral of Cologne the holy men are marching in the midst of their splendid suites, as though they were Dukes of Burgundy, while the Holy Virgin is depicted in gorgeous festival garments of the Burgundian court. Naturally the expense attending the weaving of such material was immense, and it is not to be wondered at that an author of those times should write about this pomp and luxury in the following terms:—"The nobles are completely enveloped in gold and silver, velvet and silk, and satin and taffeta. They exhaust their mills, their meadows, fields and woods, in short, their revenues, in order to purchase dresses, the gorgeous ornaments upon which, composed of embroideries, laces, tassels, fringes, chains, &c., often considerably surpass the cost of the material."

Although these splendid fabrics were produced in Italy and in the East up to the fourteenth century, we find that in the fourteenth and fifteenth centuries, owing to the emigration of Italian weavers to France, Flanders and Switzerland, the lucrative art of weaving began to obtain gradually firmer footing in these countries also.

In France more especially the kings attempted to attract the weaving artists by means of charters and privileges, and to settle them in the towns of that country. Amongst these towns Lyons took the first place, and rapidly increased, and with its magnificent productions soon became a dangerous competitor with the other manufacturing towns. This was in consequence of the extraordinary favour and protection which these towns enjoyed from the Government. We are told that in the middle of the sixteenth century Lyons gave employment to 17,000 silk-weavers; about the year 1675, to from 25,000 to 30,000; and when at its best, in the latter half of the eighteenth century, to 80,000 persons.

Now let us consider what kind of designs appear on the manufactures of Lyons, Flanders and Italy in the sixteenth century. It has already been shown by examples how the change from one style to another occurred. For instance, the change from the animal patterns to the pomegranate patterns. In the same way we may follow the gradual variations of the latter until at last a new motive displaces this pattern, which, after having fulfilled its task as a link of this connected chain of textile designs, itself gives place to the new order of things. Just as we occasionally find in some of the fully-developed pomegranate patterns small animals, relics of the textile design of the fourteenth century, so we find the new characteristic feature of the sixteenth-century pattern to be the vase in the pomegranate patterns of the fifteenth century. This ornament makes its first appearance in a very modest way, but gradually increasing in size, it finally displaces the pomegranate itself, and maintains its ground for some length of time amid surroundings of the most varied nature. The thorny branches and the rose change into the sharp-pointed oval enclosures of branches or of elegantly-drawn extended leaves, which are united at the point of contact by calyxes, crowns, &c. In the middle of this oval enclosure the vase is placed, and we see the little blossoms and flowers which were derived from the pomegranate, proceeding from the vase. The fabrics which bear these patterns are woven in a very splendid manner. They are for the most part brocades, with a ground of red satin. The design is formed by a yellow and white woof, which is joined with a warp of red silk in twilled fashion, thus giving a very soft, warm tint to the material. This effect is still more enhanced by a thin strip of silver interwoven with the fabric; this, combined with the yellow and white silk threads, gives a rich metallic lustre, with the changing hues of gold and silver. In several patterns we see alternate rows of vases and pomegranates always enclosed in the same way, or rows of vases without enclosure, and little birds sitting on the branches.

The Renaissance, with its more elegant forms, produced the most varied compositions of the vase pattern.

The great revolution in fashion which followed the introduction of the Spanish styles of dress did not fail to have an effect on the patterning of dresses. The narrow folds and slashings of the garments required small patterns, which merely relieved the ground, but laid no claim to attention on their own account. The tendrils and ribbons, instead of filling large spaces, occupied much smaller ones, in which a small palmetto, derived from the large designs of the fifteenth century, took the place of the large flower vase. The patterns are composed of elegant surroundings, enclosing symmetrical forms, such as the pomegranate or little flower vases, or lastly, little clusters of flowers formed by three or five stalks bearing blossoms and leaves. The colours now are less brilliant. The period of the religious quarrels produced by the Reformation was a more serious one. Men's consciences were awakened, and this earnest time was reflected in the cut and colour of the garments. In velvets especially the subdued tints added a wonderful effect.

During the period of transition from the sixteenth to the seventeenth century the surroundings of little patterns underwent a change, and to some extent disappeared. We can discover the former existence of these surroundings in small branches or parallelograms united diagonally. The calyxes, which formerly united the branches, being separated from them and standing self-dependent, the symmetrical form previously standing in the centre is displaced by an unsymmetrical branch with blossoms and leaves. Finally, the remaining part of the surroundings disappears altogether, and the typical pattern of the beginning of the seventeenth century is complete. It is composed of the unsymmetrical branches, with blossoms and leaves, which appeared in the last variety of surroundings. They are put in series, leaning alternately to the right and left. The style of the drawings and the detail of the plant forms are given with much variety, as well as the size of the branches bearing the flowers, which may be seen from two to ten inches long. This pattern is called "fleurs semées," that is to say, "strewn flowers."

But the more we advance in our researches the greater number of varieties of textile designs we shall meet with. On the whole, greater freedom is to be remarked in the general construction of the designs, as well as in the treatment of the simple forms, which approach more and more a realistic conception. Under the influence of the baroque and rococo styles with their caprices, which disregarded a distinct and constructive arrangement of patterns, the originality, which was periodically common to the patterns of former times, is lost. We see a multitude of designs, which are somewhat alike one another in their character, but of which we miss the common motive, which used to be continually repeated in the former designs, as, for example, the pomegranate in each pattern of the fifteenth century.

The important lace manufacture, which flourished in France more particularly under the Minister Colbert, in the latter half of the seventeenth century, introduced a variety of very splendid woven designs. They are composed of flowery ornaments, spreading out in the shape of a fan, and intersected by interwoven ribbons of lace, very cleverly imitated. The so-called "lace patterns" betray the brilliancy and luxury of the time of Louis XIII. and XIV.

With regard to their technique the velvets of this period are very interesting. The ground is uncut velvet, and the patterns are shown by the cut velvet, and are surrounded by an outline of uncut velvet somewhat higher than the ground velvet. On the velvet of the fifteenth century cut velvet of two different heights appears on one fabric, and in the stuffs of the sixteenth century we learn the difference between the cut and uncut velvet, requiring for its manufacture three different rods: one rod for cut velvet, and two rods of different sizes for the uncut velvet of the ground and of the outline. This fact is a remarkable one.

Besides these fabrics, which only show small patterns in consequence of the narrow Spanish costume which was worn all over Europe at this period, fabrics with large patterns were manufactured for hangings. These materials preserved their symmetrical character for a much longer time than did dress fabrics. We find the vase appearing also in these designs often of a large size, and surrounded by graceful tendrils, frequently filled with birds and quadrupeds and baskets of flowers. Horns of plenty, with surrounding fruit, take the place of the vase in some instances.

Other motives, having their origin in far Eastern Asia, appear in the reign of Louis XV. About the year 1720 Louis XV. sent an extraordinary embassy to the Chinese Emperor, bearing valuable presents and under instructions to co-operate in trade relations, and to revive such as already existed. In return for this politeness, the Chinese Emperor selected splendid presents for the King of France, composed chiefly of beautiful pieces of porcelain, lavishly decorated with Chinese figures and ornaments. This occurrence rendered Chinese style fashion-

able in the upper circles of France for a short time, and the originality of this distant nation in their style of ornament appeared in the textile designs of this period—Chinese vases, the characteristic dragon, landscapes with the curious Chinese perspective, pig-tailed sons of the Chinese empire in boats, and so on.

Contemporary with these patterns after Chinese style, a noteworthy feature was the use of plant forms drawn from nature. Flowers and leaves are rendered with the full effect of light and shade, and the natural colours of the flowers are imitated. The rose is used for choice, but fruit also, cherries and plums; in fact a profuse flora in all possible fantastic forms, together with parts of architecture, cascades, shells, rocks, &c., served as models for the textile patterns of this time. A very good effect was produced by supporting the many-coloured floral ornament by a fanciful ornament woven in gold thread, by means of which the whole composition acquires a peculiar silhouette effect. Textile design has here reached its highest point, both in a capricious choice of motive, in combinations of brilliant colours and in the richness of the bindings.

In the time of Louis XVI. these grand designs, admirable notwithstanding their quaintness, disappeared and gave place to patterns which, as regards delicacy of composition and softness of colour, leave nothing to be wished. The large bunches of roses are diminished to very small elegant nosegays shown upon a white ground with narrow stripes. The colours are reduced to such an extent that they no longer remind us of the preceding luxurious and splendid coloured ornamentation. These small patterns are intermingled with a variety of hunting, fishing, music and such like symbols; fluttering ribbons, festoons, fruit baskets, &c., appear in the intervening spaces. They are the reflection of a period when ruin was approaching and when no energetic effort was possible. The designs on the textiles are a faithful mirror of the trivial social life of that time. But this state of things did not last for long. Probably in consequence of the excavations at Herculaneum and Pompeii motives were furnished for woven designs, which were taken from the wall-paintings of Classic antiquity. They bring us, after the desolation which the French Revolution spread over art, science, industry and trade, to the style of the first French Empire, which found its opportunity in the imitation of the antique.

Thus having brought before you the changes of pattern and style from the earliest days to the beginning of the present century, I discontinue my researches. If we examine the rich collections of antique woven fabrics, which now are established in many towns, we shall be astonished by the manner in which our forefathers could produce wonderful effects with very insufficient mechanical assistance. And now the problem is left us of studying the rich treasures hoarded up in textile museums, and of making use of them for the textile industry, which, as we have already seen, is so very important to the welfare of entire countries and towns.

To encourage all these endeavours, and to bring to notice all the beautiful and interesting subjects for investigation which this subject offers, these remarks have been made; but they do not in any way pretend to have dealt exhaustively with such a very extensive subject.

THE GLASGOW SCHOOL OF ART.

A REPORT has been prepared by a deputation consisting, among others, of Messrs. Burnet, Leiper and Salmon, architects, and Mr. Newbery, head-master, that visited Manchester, Birmingham and London, with the object of ascertaining to what extent technical education could be promoted in the Glasgow School of Art.

They state that in Manchester the passing of the Technical Instruction Act, 1891, decided the City Council to assume the duties and responsibilities set forth in the provisions of the Act. To carry out this purpose a technical instruction committee was formed. Under the Act the Council have power to call up the penny rate for technical education to the full extent. This yields about 11,000*l.*, but so far the draft upon the rates has been slight, the money mainly coming from the funds arising from the Local Taxation (Customs and Excise) Acts of 1891. These funds yielded last year a revenue of 14,300*l.* Of the moneys so received the School of Art was granted last year a sum of 750*l.* and the Technical School 4,000*l.* Designs for a new municipal technical school have been accepted by the City Council, and powers have been sought to raise 150,000*l.*, which covers the estimated cost of the school. This sum will be borrowed on the security of the rates. All fees and all grants from the Science and Art Department pertaining to either school are paid into the common fund, and the teachers' salaries are not regulated by Government grants. Upon the invitation of the School Board, a visit was paid to the Central Board school, Deansgate, Manchester. The School Board does not undertake higher art education. The Art Galleries built in 1825, and then known as the Royal Institution, were handed over to the City Council in 1883, and formally opened as the

City Art Gallery. The annual exhibition of pictures is thrown open to the public on the last two Sundays of the year, and a catalogue is then provided gratuitously by the committee.

In Birmingham, as in Manchester, a central school of art, with fourteen branches; a technical school, the art galleries and museum, and a museum and gallery at Aston Hall, are directly controlled and supported by the Corporation. Certain gentlemen undertook to give land and build a school of art on condition that the town should take over the school when built and carry on its work. The offer was accepted, and the result is that the Central School of Art, Margaret Street, is one of the finest, and certainly the best-equipped school in the three kingdoms. Its success has been so great that a large extension for technical instruction in art, costing 16,000*l.*, has been found necessary. Emanating from it, and governed by its headmaster, are fourteen branch evening schools—one held in a special building, and thirteen held at a nominal rent in the rooms of Board schools. The School Board does not undertake any art teaching in evening classes. The technical school is directly controlled by the Corporation, who have recently purchased a site, at a cost of 12,388*l.*, for the erection of a new building. The Municipal School of Art (central and branch schools), the Museum and Art Gallery, and Aston Hall, are supported under the Birmingham Corporation (Consolidation) Act, 1883, which, amongst many other things, extends the powers conferred by the ordinary free libraries legislation. The Corporation of Birmingham have under their Act unlimited rating powers. As a matter of fact, however, the Art Gallery, Museum, School of Art and art classes combined have not until this year required as much as one penny in the pound. One penny in the pound over the rateable area of the city realises 8,500*l.* The moneys arising from the Customs and Excise duties are estimated for the current year at 13,000*l.* The committee of the School of Art reports in the month of April. The fees, grants, &c., amount this year to 5,724*l.*, which, with 5,699*l.* applied for and granted, makes a total of 11,423*l.* as the estimated cost of carrying on art instruction for the present year. An extremely interesting visit was also made to the Vittoria Street branch school. In this school there is a special room rented by the Jewellers and Silversmiths' Association, in which an experiment is being tried of executing work in the technique of jewellery, such as repoussé, enamelling, chasing, engraving and setting. The present is the third year of the trial, and the experiment seems warranted by the success. In the class of designs chosen, and in the workmanship, an endeavour is being made to interest the student in the production of work of a higher grade than that in which he is engaged during the day.

At South Kensington, General Donnelly, the secretary, and Mr. Thomas Armstrong, the director for art, received the deputation, and put themselves to considerable trouble to assist its objects. The import of the conversation was to the effect that "technical education" could not mean the education of the artisan in art solely with a view to meet the present market demands, but must always be directed to the principles of art as applied to the various industries of the country. The purpose for which schools of art were founded was not to produce designs which should meet the passing needs of the current market or the prevailing fashion, but to educate the designer in the art of design. The authorities would in every way encourage and assist the School of Art in Glasgow to promote instruction in such subjects as designs for glass-staining, wood-carving, metal work, pottery, bookbinding, or any other industries of Glasgow and its neighbourhood in which art is an important factor. It was emphasised that such instruction, however, should strictly be confined to students who had shown satisfactory proof of their powers in the advanced subjects of an art school curriculum. These technical classes should be conducted by artist craftsmen in each speciality. The deputation was to learn what was being done in the art schools of Manchester and Birmingham, particularly in the matter of technical education as applied to art. The information gathered is of considerable value, and what was seen cannot but encourage the governors to press forward the work of the school with greater confidence on the present lines. Although at present we may consider the Glasgow School of Art is doing work equal to that done by the art schools of Manchester and Birmingham, it is far behind these schools in matters both of accommodation and monetary aid. The main efforts must be as at present directed to a purely art education of the highest order, and this should be supplemented by an application of the education thus gained to the various crafts and manufactures of the city. Three facts stand out prominently. (1) That the industrial leaders both of Manchester and Birmingham are fully alive to the benefits to be derived from raising the artistic appreciation and reputation of their respective cities, and realise that this can best be done by collecting and exhibiting the highest art work produced in each craft, and by encouraging the study of the same both in their art schools and by the public generally. (2) That the municipal authorities of these places appreciate these necessities, and are giving liberal

support to art and technical instruction; and (3) that they are entirely devoting the moneys received under the Customs and Excise Act, 1891, to the furtherance of these objects. To these may be added that in Birmingham a thoroughly satisfactory organisation has been built up, under the control and responsibility of the Corporation, whereby under the Birmingham Consolidation Act the overlapping of different agencies is avoided, unnecessary competition is checked, and needless expenditure, both of teaching power and money, is prevented. The deputation think they have exhausted their commission in obtaining and placing before the governors and others interested definite information of the matters set forth in the foregoing report. The conditions of every city are so dissimilar that they do not think it would be advisable for them at present to formulate suggestions based on the report.

DUNBLANE CATHEDRAL.

THE restoration of Dunblane Cathedral is approaching completion. The restored cathedral, says the *Scotsman*, is a beautiful building, conserving, as it does, all the fine features of the old work, and in whatever there is that is new in it showing a skilful harmony between ancient and modern, which exhibits the skill and artistic taste of the architect. For the restoration the country is chiefly indebted to Mrs. Wallace, of Glassingal, a member of the Baird family, who originated the programme, and who has supplied the bulk of the funds—amounting, it is understood, to over 20,000*l.*—for this pious work. The other contribution was 3,500*l.* received from the heritors, who, had the restoration not proceeded, would, it was understood, have been at that expense in building a new parish church, and the cost of the east window, about 700*l.*, was defrayed by Sir John Stirling Maxwell, Bart., of Pollok. The whole of the work has been carried out under the superintendence of Dr. Rowand Anderson, architect, Edinburgh.

Dunblane Cathedral has a chequered history. It occupies a site which has been intimately associated with Christianity since its introduction into Scotland. In the end of the sixth or beginning of the seventh century tradition has it that Blaán, who was of the royal race of the Dalriads of Ulster, founded a small monastic fraternity of the Culdees here, and probably exercised over them the function of abbot or bishop. Then the record is blank for several centuries. In the twelfth century the See fell under the feudatory influence of Gilbert, Bishop of Strathearn; but the handsome endowments he gave it seem to have been wasted, for in 1233, when Bishop Clement came upon the scene, he, we are told, found a roofless church wherein a rustic chaplain said mass thrice a week. He and the Bishop of Glasgow were ordered from Rome by Pope Gregory to levy a tax on all their parishes for the restoration of Dunblane—the alternative being the translation of the site to Inchaffry. The tax seems to have yielded what was expected of it, and Bishop Clement proceeded to build the cathedral very much as it has come down to the present day—demolishing the Romanesque Culdean church, and leaving only the tower, which is now incorporated in the south wall of the nave.

The cathedral consists of a choir, 80 feet long by 28 feet wide, having on the north side of it a long aisle-like apartment of two floors, the lower of which is vaulted; the nave, with north and south aisles, 129 feet long and 58 feet broad, and divided into eight bays, a peculiarity of which is that no two of them are of the same size. There is also the old tower already referred to, which rises on the south side opposite the fifth bay, counting from the west, and is 22 feet square and 97 feet high, surmounted by a slated spire 20 feet high. The building is, with the exception of the lower two-thirds of the tower, of the period of Bishop Clement, who, as already said, flourished in the middle of the thirteenth century. The excepted part of the tower belongs to the eleventh or early part of the twelfth century. The upper third of the tower is assigned to the end of the fifteenth century. The two west divisions of the north aisle, with rather clumsily constructed square-headed windows, belong to a very late period, and the architect, wishing the building to tell as much as possible the story of its construction and successive repairs, left them as he found them. The cathedral, as is well known, has long been famous for the elegance of the great windows in the east and west gables, and there is the "Vesica" window in the apex of the west gable which has been immortalised by Ruskin in his Edinburgh lectures. Ruskin has said that he knows nothing so perfect in its simplicity as the west window of Dunblane. There being no vaulting to the nave, there is no triforium. The clerestory comes immediately above the nave arches. There is a passage in the thickness of the wall, the inside face of which consists of a series of moulded arches, two to each nave arch, and the outside window face corresponds with the inside one. The chancel arch is not of great height. Over it is a double-arched opening, which puzzled experts greatly. There is a passage in

the thickness of this wall, also with access to it from the clerestory passage; and the Marquis of Bute, who has taken great interest in the restoration, suggested that the arched opening might have been used for the display of relics to the worshippers in the nave. The discovery by the architect in the ashlar facing of the wall of holes for receiving the struts for supporting a gallery seems to corroborate this view.

The nave had been unroofed in the Reformation times, and was rapidly going to decay when the restoration scheme was commenced. In the *Scotimonasticum* it is related that in 1559 the Prior of St. Andrews, who had joined the Earl of Argyll with 300 burgesses of Perth, entered the nave during service. While Bishop Chisholm parleyed with them, his congregation melted away. They sacked the chapels, and tore down the woodwork, which they burned, throwing the ornaments into the stream below. In a short time the destruction was complete. After 1564 the church was served by Protestant ministers—the first being one Andrew Graham, a “a preacher of the Word of God.” Thenceforth the building seems to have been much neglected. As to the choir, it is stated in the Statistical Account of 1793 that “the original ‘Popish roof’ is still on the choir, very old and not deemed safe.” This roof was removed in 1860. Several other alterations were made in the year 1818, with a view to rendering the choir a more convenient place of worship. At that time the tracery in the great east window and in the six windows in the south wall of the choir was replaced by perpendicular tracery of an incongruous kind with transoms. The tracery in these windows was replaced in the present restoration by tracery of a more suitable style. Repairs and alterations were also effected upon it in 1870.

In the restoration the architect has repaired and removed only where structurally necessary. Where the old work was sound, although chipped and superficially decayed, he has left it alone. The wall-heads having been repaired, new oak roofs on nave and aisles were put on, and under the protection these afforded the minor repairs were effected. These consisted chiefly of cutting out parts that could no longer hold together and repairing them with sound and new stone, repairing the gable-tops and skewes, making good the rybats of the windows where they were so decayed that they could not be glazed, and repairing the walls where there appeared any signs of weakness.

The nave having been dealt with, the choir, which had been used as the parish church, was then vacated. Here also a new oak roof was put on, and the partition wall that had been erected in the chancel arch was removed. The wall heads were dealt with as in the nave, and the window tracery was renewed. Before the soil and vegetation on the area of the nave and aisles were removed, a careful plan for preservation was made showing all the graves. The whole area was then concreted and asphalted—the finished floor of the nave being a stone one, and composed of red, yellow and black freestone laid in various patterns with excellent effect. The floor of the choir is of tiles and marble; and here have been placed part of the original oaken stalls of the old cathedral—the only things that escaped the hands of the wreckers at the time of the destruction of the sacred edifice already referred to. Divine service has been conducted in the nave of the restored cathedral for some time past, but the choir restorations are not quite finished. The organ case and fittings are in hand, and it is hoped the formal opening of the restored edifice will take place during the summer.

Several exceedingly interesting monuments have been dealt with in the course of the restoration. The founders’ arch was discovered and restored in the north wall of the choir, and in it has now been placed an effigy which tradition said was that of Bishop Dermoch, but which there is reason to believe is no other than that of Bishop Clement, the builder of the cathedral. Among the other effigies are those of a knight in armour and his lady. It was said to be the second Earl of Stratherne, who died in 1271; but the character of the armour and dress points to an earlier period, and it is believed on such evidence that the knight is Gilbert, first Earl of Stratherne, who founded the See and endowed it so richly in the early part of the thirteenth century. There is also in the nave another sepulchral niche and effigy traditionally known as Bishop Ochiltree’s, but the figure evidently does not belong to the niche, as the feet have been cut away to make it fit. There are also the remains of the Strathallan tomb, a work of the seventeenth century of no great interest. Among the more interesting monuments are three blue stone slabs—the matrices of brasses which had been placed there to the memory of Margaret Drummond and her sisters Euphemia (Lady Fleming) and Sybilla Drummond, who came by a tragic end at Drummond Castle in 1502. With Margaret Drummond—who is described as a lady of rare perfections and singular beauty—James IV. fell deeply in love, and made her a promise of marriage. But for political reasons the nobles wished the young king to marry a daughter of Henry VII., and the clergy also forbade the alliance as being within the forbidden degree of consanguinity. As the king was obdurate his mistress’s death was resolved upon, and this was effected by means of poison mixed with food served up at a

breakfast to which she had invited her two sisters. They perished with her, and the three sisters were interred in the chancel of the cathedral. It is gratifying to know that it is proposed to replace these brasses, though without attempting to reproduce the originals, of which no record remains.

It only remains to add that the restored cathedral has been transferred by the Government from the care of the Board of Works to that of the Board of Manufacturers—an eminently suitable body for the custody of this and similar ancient buildings—embracing, as it does, men of antiquarian knowledge and artistic taste.

GENERAL.

Messrs. Richardson, Ellison & Co. are the makers of the wrought-iron gates and railing for the Imperial Institute, according to the designs of Mr. Thomas E. Colcutt, architect. The whole of the wrought-iron grilles for the window openings and finials, as well as the polished brass guards for the post-office and waiting-room on the first floor corridor, were also made by the firm. This metal-work possesses remarkable interest, and should not be overlooked by all visitors to the Institute.

Mr. E. A. Grüning has been appointed arbitrator to settle the dispute between Mr. Charles Wall and the London School Board. Compensation is claimed for increased cost in executing and superintending the works at a school in Fulham, which, it is alleged, threw work that should have been done in fine weather into winter, when the short days greatly enhanced the cost of execution.

The Edinburgh Architectural Association will to-morrow (Saturday) pay a visit to Nunraw, by permission of Mr. W. W. Gray. Nunraw Castle is a specimen of the Scottish baronial style. The oldest part was erected in the thirteenth century, and formed an appanage of the Nunnery at Had-dington, and possesses interesting ceilings, armorial bearings, carvings, &c.

The Comte H. Delaborde has prepared a book on the building where the sections of the Institut meet in Paris. It is called “*Origine et Destinations successives du Palais actuel de l’Institut*.”

The Committee of the Meissonier Exhibition, in Paris, have handed over 25,000 francs to the Night Asylum Charity; 12,500 francs for the Victims of Duty, and 12,500 francs for the Orphanage of the Arts, or in all 2,000*l*.

The Candidates for a chair in the Académie des Beaux-Arts, vacated by the death of Cabat, the landscapist, are the painters, MM. Joseph Blanc, Benjamin Constant, De Curzon, Harpignies, Maillart, Aimé Morot.

Mr. George Pownall, who for many years was a prominent surveyor and valuer in London, died on Sunday last in his eighty-fifth year.

An Arts and Crafts Exhibition will be held at the New Gallery about October next.

Mr. J. W. Trounson, Penzance, has been appointed architect for the renovation and enlargement of the High Street Bible Christian Chapel, Penzance.

The Surveyors’ Institution will meet on Monday, the 8th inst., when a discussion will take place on Mr. R. F. Grantham’s paper, entitled “Recent Experience in Sewage Filtration considered in Relation to River Pollution.”

The Clerestory of the nave of Holy Cross Abbey Church, Shrewsbury, is to be rebuilt under the direction of Mr. J. L. Pearson, R.A.

Professor Flinders Petrie will read a paper on Primitive Art in Egypt before the Applied Art Section of the Society of Arts on Tuesday next.

The Institute of Painters in Water-Colours have elected Messrs. Lucien Davis, H. M. Rheam and Leslie Thomson as members.

The Council of the Whitworth Institute arranged for the summer exhibition to be opened on Wednesday, May 3. It will continue open every day except Friday, from 9 o’clock till 5, and on Sundays from 2 to 5 P.M. The scheme of the exhibition is historical, and it will consist of water-colour drawings, with the addition of such oil-paintings as have been bought out of the Jubilee Exhibition grant of 20,000*l*. and have been given or lent; and of a series of engravings of notable pictures which appeared in that exhibition.

The Late Earl of Derby has bequeathed 2,000*l*. for the purchase of pictures for the Walker Art Gallery, Liverpool, the interest to be devoted to the encouragement of rising artists, and to the Liverpool Museum a cabinet containing minerals and antiquities in his lordship’s house at St. James’s Square.

A New Church is to be erected at Hexthorpe, near Doncaster, to cost 4,560*l*., the whole of the cost being met by Lord Grimthorpe and his sister, Miss Augusta Beckett-Denison, of The Hall, Doncaster.

The Crypt of St. Mark’s, Venice, which dates from the eleventh century, is now illuminated by means of electricity, and was opened to the public on the festival of the patron saint. The ninth-century crypt is still kept closed.

The Architect.

THE WEEK.

WHAT MONTAIGNE says of his family might be used to describe the spirit which inspired the last Academy election. Both sought after something "sans éclat et sans tumulte," were "particulièrement ambitieuse de preud'homme." Four additions have been made to the party that believes so steadfastly in standing still. Mr. HENRY MOORE, it may be assumed, will continue to give the bluest waves, regardless of the difficulty he imposes of discovering any reason for the repetitions. Mr. MACWHIRTER can consider he has obtained a sort of patent for the perpetual production of a couple of favourite trees. Mr. HENRY WOODS need not exert himself more earnestly than he has done since he was enrolled as an Associate. In fact, the three artists, as well as their supporters, may now rest, and it is for the public to be thankful for possessing such Academicians. Mr. J. W. NORTH is no doubt superior to many of the landscapists who can append the letters R.A. to their names that are assumed to be the evidence of excellence, but having hit upon one aspect of country scenes, he remains so faithful to it, we suppose it was assumed that his russets would be as perpetual as Mr. MOORE'S blues, and therefore he was the most eligible for an associateship. The President may talk in his blandest manner about his sympathy with those who are seeking after something that is not stereotyped, but it is evident that he is not able to persuade the prudent men who are around him. They find that the sort of work which is most convenient to produce is "sans éclat et sans tumulte," and when they are so comfortable, why should disturbing forces be introduced among them? The contributions of the majority of the Academicians to each new exhibition prove that pictures at least are coming nearer to an uniform standard, and the latest additions will not need much training to co-operate in the endeavours to reach it. People who are simple enough to imagine that art is or can be made progressive will be disappointed, but the spirit that animates the Academy ought to be known to them before now.

THE decision which was given in the Queen's Bench Division on Monday, in *GALE v. HARVEY* and others, should be taken as a warning by intending tenants who are desirous to have security against expenses incurred through defective drains. A widow lady took a house at Southbourne, Hampshire. Apparently she did not employ an agent in the transaction. She asked the landlord before signing the agreement whether the drains were "all right." He replied in the affirmative, whereupon she signed the document. During the tenancy her daughter fell ill, and the illness was ascribed to defective drains. An action was taken in the County Court, claiming 50% damages for medical expenses, &c. In defence it was said that the landlord had grounds for believing that the drainage was in an efficient state, and there could be no doubt that there was at least a partial overhauling of the drains. Whether there was any guarantee about them in the agreement could not be discovered, for the document was mislaid and the tenant did not appear to possess a copy. However, the County Court judge, accepting the tenant's statement, declared that the expenses arose out of the insanitary condition of the drains, and gave judgment for the 50% claimed. The landlord appealed. The Queen's Bench Division set aside the judgment for the tenant on the ground that there was no evidence of a guarantee of drainage forthcoming. It was the plaintiff's business to prove a contract, and there was nothing to compensate for the absence of a written document. As it was not plain that the tenant did not contribute to making the drains defective there could be no charge of fraud maintained. The conclusions to be drawn from the case are, first, that guarantees of sanitation must be in writing, and, secondly, that ladies will find it safer to employ agents of experience to conduct the negotiations when they are desirous to rent houses.

SINCE the German Parliament has not been as tractable as was desired, the Emperor cannot feel kindly disposed towards it. But that is no reason why the architect of the Parliament House should be compelled to endure the force of imperial irritation. His Majesty has declared the building to be the acme of tastelessness (*den Gipfel der Geschmacklosigkeit*), a phrase which will gratify Sir WILLIAM HARCOURT, since he believes that the power to design public buildings is becoming weaker and weaker. Now, in justice to Herr WALLOT, who designed the new Parliament House, it must be allowed that he was tied down to a fixed plan, which represented the labours of members as well as officials and experts. His suggestions about deviations from it were disregarded, and he was made to feel that his business was to make a sort of skeleton assume a presentable form. When the difficulties of that sort of commission are remembered, all persons (especially any who have had even the slightest experience of dealing with German bureaux) will allow that Herr WALLOT has exercised much skill. That he gained his position in a competition is evidence that he did not take the authorities unawares. The building was also erected under the scrutiny of those who were to use it, and the fact that the position of the Chamber was determined by Prince BISMARCK to suit his convenience suggests the extent of the architect's authority. It is characteristic of the Emperor that he contemplates the ordering of a new course of training for architects as a consequence of his dissatisfaction. Although there is probably not one German architect in practice who has not studied in Italy, it is likely that hereafter every one who aspires to have a part in the erection of public buildings will have to give proofs that he has gone through a long and serious course of study in Rome. At present it might be said that the defects of modern German, or rather Prussian, buildings arise from an overgrowth of knowledge. They are as exact in their details as if they were casts of old works. It would be difficult in one of the suburban villas of Berlin to find a straight line or a curved line, an ornament or a piece of sculpture, that is not rigorously exact. It might be supposed designers and artificers were controlled by efficient drill sergeants. But in architecture something else besides correctness is needed, and the Emperor is likely to find that it is not to be attained by insisting on its presence.

THE Master Builders' Association have taken action in the strike that has begun at Hanley. The joiners who are responsible for initiating the disturbance proposed that six masters and six employes should settle all disputes without reference to an umpire. The masters say that the present strike is proof that this plan is unworkable, for six masters and six men have already met; they could not agree, and a strike is the result. The masters refuse entirely to agree to the proposed rule that they shall not use imported joinery. This rule interferes with their liberty and manner of conducting their business, and is opposed to the principle of free trade. When in England machine-made goods of any kind from abroad can be refused, it will then be time for the joiners to ask for a rule of this kind. As regards apprentices the masters contend that if a master could have one apprentice to every five men it would be possible for a master employing thirty men to have bound to him six apprentices. Then if trade became slack, and he had to reduce his men to six, he would still have to keep the apprentices, and would have an equal number of men and boys. The proposal would, therefore, be a disadvantage for the men. The masters have conceded to the men the hour which they desire on Saturday—that they shall leave work at twelve o'clock instead of one o'clock—at a great inconvenience and loss to themselves. All men who are paid by the day, such as apprentices, clerks and carters, would have to be paid for this hour without any equivalent. Large orders for joinery usually made in the Pottery towns are being sent away to be executed elsewhere. In this case there is no doubt that the masters have right on their side.

PAINTING AT THE ROYAL ACADEMY.

WHEN we find Mr. SOLOMON and Mr. BRAMLEY painting festive birthday scenes (for it is the younger artists who of late give character to Academy exhibitions) instead of classic and seaside tragedies, and that Mr. HACKER tries his hand on nudities in a sun-lighted field, it may be inferred that a great many pictures of pleasant scenes are to be found this year on the walls. It ought to be an exhibition which should afford much pleasure to visitors. There are few paintings exhibited which are too deep for the multitude, and there are so many versions of domestic subjects that the exhibition may be taken as essentially English. We can, however, notice only those works which are in some way exceptional.

It is not easy to discriminate between "costume pieces" and what are supposed to be historical paintings in an Academy exhibition. Sir JOHN MILLAIS'S *The Girlhood of St. Theresa*, in the first room, will no doubt be accepted as history. But can anybody imagine that in this sullen little brunette there is the material for a mystic? Would the boy she leads (holding him by a hand that is very badly painted), if a Spaniard, be captivated by an orange? As history the scene excites wonder for the scholarship of English painters, but as a picture of two children of types that the artist had not earlier represented it has interest. The costumes are of costly materials, and there is much gold embroidery on one, but, unless we are mistaken, they were not derived from Avila. Near it is an historical work of another class, *The Wrestlers' Stone Age*, by Mr. STUART G. DAVIS. The subject is a favourite with modern French artists, but they do not forget that most people nowadays know something about evolution. Accordingly while using such models as are at command they take hints from photographic representations of inferior races. With the exception of a little wildness about the heads (and it would not be difficult to change the hair into hyacinthine locks), Mr. DAVIS'S wild men are English townsmen. It might be imagined that he would gladly make use of the chance to show bodies that gained some colour from exposure to the sun; those in the picture are as pale as any seen at a bathing-place.

The *News from the Armada*, by Mr. SEYMOUR LUCAS, in the second room will gratify many visitors, for, in spite of what the artist has suffered, he can still paint as well as ever. The picture, in fact, reveals an increased power of thoughtfulness. It is supposed to illustrate the fact that the loss of the Armada "affected PHILIP so much that he shut himself up in the Escorial and no one dared to speak to him." The king is seen kneeling at a prie-dieu, a long rosary in his hand; but, like CLAUDIUS, if his words fly up his thoughts remain below. He looks not to the altar in front but towards the right, as if he expected intelligence which would revive his hopes. The agitation of his mind is suggested not merely by the nervous face which is not entirely controlled by consciousness of dignity, but by the evident alarm of the few men who are seen in the chapel, and who seem doubtful about the form in which PHILIP'S sense of defeat may express itself. No doubt Mr. LUCAS is aware that, according to some authorities, the king bore the defeat of his fleet with fortitude, and on that account the picture shows more restraint than the words which inspired it would warrant. The execution is excellent. The king has to be isolated, but it was a happy thought to diminish the effect of vacancy by introducing an immense brass candlestick on either side of him. His black dress is also relieved by the embroidered covering of the prie-dieu, and stands out well against the panelling of the walls. As Mr. BRITON RIVIERE has gone to RAWLINSON'S "Ancient Monarchies" for his subject, it may also be taken as historical. The *King's Libation* is a sort of supplement to the Assyrian series of royal sporting scenes which are in the British Museum. In one of them the king is seen standing with a cup in his hand over a conquered bull, and in another over a lion. Mr. BRITON RIVIERE introduces several lions as victims of the royal bow. They are not of the small species seen in the reliefs, nor are they deficient in the shaggy mane. The king does not wear the tiara, his black hair being bound by a simple fillet, and he has left off the cumbrous outer garments with their tasselled fringes. The scene gains by the abandonment of archaeological detail; the pouring of the libation of blood becomes

a serious, if simple, ceremony, for the king ceases as it were to be a demigod and is a mortal before the gods. But kings and courtiers are only secondary figures beside the lions that appear to have gained dignity in death.

It was said before the exhibition opened that the picture of the year was to be Mr. DICKSEE'S *Funeral of a Viking* or Mr. CALDERON'S *Elizabeth Woodville*. Both have very great merit, but may we add that the interest of both is diminished the more often they are seen? As regards the *Viking*, it is partly caused by the difficulty of realising that the scene took place outside a studio. It is not sea-water on which the boat with the body of the old pirate is launched; it is not northern nor any air which makes the torches flame. The general effect is also over-boisterous. Assuming that men believed that the last voyage was to Valhalla, where heroes and valkyries awaited every brave Norseman, it was not in human nature to allow a chief to depart without some regret. The discipline of the Vikings would also compel them to restrain their exultation on such occasions. It must be allowed, however, in justice to the artist, that his work is as difficult as was ever undertaken. To have achieved partial success with a subject of the kind is creditable. Probably one cause of the shortcomings arises from the influence of archæology. It is not difficult to arrive at a knowledge of the costume, arms and ornaments of the Northmen, but as in this country an artist must go through the inquiry without much help, he is apt to over-rate his discoveries. If Mr. DICKSEE could have forgotten that he was to paint a great deal of metal-work until his figures were arranged, his work would probably have been more impressive. Mr. CALDERON does not make costumes or trinkets obtrusive in the *Elizabeth Woodville*. The dress of the queen and courtiers may be considered as of the plainest. The whole picture is treated in a severe manner. The queen is not over-demonstrative in parting with her son, the Duke of YORK; the archbishop, as becomes a womanly old man, evinces subdued plausibility, and the courtiers are only lookers-on. The picture probably corresponds with the mental vision of the majority of ordinary people who read of the parting, but an artist should possess insight enough to give us more. Mr. CALDERON has not been able to do anything which would impart reality to the scene, and with all the care he has exercised his big picture is hardly more vivid than one of the engravings in an illustrated history of England. On the opposite wall is the President's *Rizpah*. This work, like the *Farewell* in the first room, is interesting from the frank display of method. In both rigid lines are brought into contrast with the contours of limbs or with the folds of drapery. The white cloths which the Jewish woman has thrown over her sons are not out of place, and they aid as opposition of form and colour. So far as we remember there is no precedent for so peculiar a disposition of covering, although white stuffs have been repeatedly placed near dead bodies. It is undoubtedly the most daring experiment in the exhibition; but as technique is not generally understood, it may not be appreciated. Variety is also given by introducing a girl among the victims, and enables a warmer colour to be used in the garment. RIZPAH is a dramatic figure, and adapted to the situation.

The *Glass of Wine with Cæsar Borgia*, by the Hon. JOHN COLLIER, deserves all the admiration it has obtained. The story is told in a way everybody can understand, and the *dramatis personæ* in appearance correspond with the general notions about them. A good many painters would accentuate the incident by introducing images or symbols of a religious kind, but it is impressive enough by itself. CÆSAR offers to fill his guest's cup with poisoned wine. The young fellow realises the position in which he is placed. The Pope waits for the *dénouement*, as if he expected there might be some novelty in it. LUCREZIA is *blasé* with tragedy, and hardly condescends to notice the victim. There is consistency throughout, and no excess of action or passion anywhere. If medals are to be relied on, LUCREZIA BORGIA presented a more woebegone aspect (as of one who, like Lady MACBETH, had known what she should not), and ALEXANDER VI. was less intellectual in appearance; but it is allowable occasionally to take liberties with evidence. In the same room Mr. T. R. SPENCE has a painting, *The First Invasion of Rome by the Gauls*. The incident is dramatic, but all artists who

have attempted it imagine there is only one way to treat it, that is by arranging the senators in a row on a curved bench, with PAPIRUS placed at the end, and bringing in the invaders on the left. We should like to see more variety in the arrangement of the figures, and Mr. SPENCE evidently would have given more animation to his line of senators if he did not believe he was constrained by precedent. The *Trial of Joan of Arc*, by Mr. F. ROE, has an unreal appearance. The tribunal in Rouen was not arranged so simply, and did not mean a bishop seated alone with a few monks at a distance. From the reports of the trial it is evident that there was a variety of judges, assessors, reporters and other officials. The painting may, however, be considered more satisfactory than if it were as correct as M. LENEVEU's scenes in the Panthéon of Paris.

There are peaceful and warlike scenes which, if they do not bring the gorgeousness of the East before us, are supposed to reveal to us something that is to be seen there. But the region of black and brown, "the shadow'd livery of the burnish'd sun," is so vast as to have something indefinite about it, and it would therefore be an advantage if painters were a little more precise in their titles. Whereabouts on the map are we to look for the spot whence Mr. LAVERY derived the lithe, if unmuscular, fellows who wear such brilliant red and green garments as we see in his *Moorish Dance*? There is something strange about Mr. BRANGWYN's *Slave Market*, and yet it may represent an ordinary scene in some village that is not remote in Asia or Africa, but the fine colour would become as attractive if we were assured it was painted after a dream. The two pictures may be more interesting, but they have not that appearance of convincing prosiness which Mr. W. C. HORSELY resolutely puts on canvas. Mr. ARMITAGE's *Moslem Doctrinaire* looks like a portrait, but does it represent a hard-featured man who made a journey to Mecca? Mr. JOHN GRIFFITHS's *On the Temple Steps* is unquestionably a genuine scene, for a Londoner could hardly believe that women and children can be as shadowless as "PETER SCHLEMIHL" and yet be happy. Too little use is made of Indian subjects, and this work is therefore welcome. It well deserves its place on the line, for the artist has not evaded any difficulties, and in spite of the mass of white in the building, there is no startling contrast, and the eye can rest on it without becoming tired. *After the Attack on Sherpur*, by Messrs. CLARK & HAMILTON, also appears to have some reality about it, and suggests what war can do in desolating a district. Mr. E. CROFT's *Charge of the 3rd King's Own Light Dragoons, Moodkee*, does not correspond with the traditions of the fight. The Sikhs did not allow victory to be won so easily as appears, but some English battle-painters seem to believe they must represent English troops as if they were Olympians and can conquer by other means than muscle. Lady BUTLER's paintings have been an exception. In the *Camel Corps* of this year the artist has evidently disregarded the necessity of laying on colour for competition's sake. A novel and interesting scene is represented. Looking at it, we must feel the camel is a maligned animal, for it can be disciplined without much sacrifice of its appearance. There is no doubt that in a smaller gallery and surrounded by fewer works, the intrinsic merits of the picture would be more apparent.

The new and old styles of landscape will be suggested without going beyond the first room, by a comparison of Mr. LEADER's and Mr. MURRAY's paintings. *A Hillside Road*, by Mr. LEADER, is so forcible that he must have been thinking of over-mastering all works near him. But as an expression of a scene, how much more impressive is Mr. MURRAY's *Meadow Sweets*, which, although the greens are Frenchy, suggests we have something before us that is derived from one simple spot, and is not made up of parts of several scenes. The *Fir Faggots* also appears as an unconventional picture of very rough ground. Mr. COLIN HUNTER's *Waiting for Low Tide* is sketchy, and would perhaps look better if it were much higher on the wall. *The Old Bridge*, by Mr. E. A. WATERLOW, is as quiet and dull as could be desired, but the masons who built the bridge must have been unwise, for a pier is in the centre of the river. Mr. WYLLIE's *Newbiggin Bay* seems brighter than most sea-pieces, as coming from a hand that so often selects grimy subjects. Mr. J. E. HODGSON's *Rural England* is

elaborately worked up, and apparently it is a view of a real scene; but as it is flanked by an Italian group by Mr. H. WOODS and a brilliant *School Master's Garden* by Mr. MACBETH, it appears flat and monotonous in colour. Mr. BRETT's *Pearly Summer* would serve as a companion to the *Britannia's Realm* of a former exhibition. Mr. W. L. TURNER's *Strength of the Hills* displays much power. The *Orchard in Picardy* and *Loch Marée* will surprise people who think of him only as a cattle-painter. *Evening*, by Mr. M. R. CORBET, is impressive, and Mr. SOMERSCALES's marine piece should not be passed over, however brief is the visit.

Portraiture, as usual, monopolises the greater part of the walls. Sir J. E. MILLAIS's *John Hare, Esq.*, shows imaginative power in other ways besides the brown colour that is spread over the face. As a work of art, Mr. H. BISHOP's *Miss Huppertz* and *Miss Salvesson* on the same wall is of far more importance. This year Sir J. E. MILLAIS is unlucky in his flesh tints. If the *Merry* in the largest gallery came from an outsider, would it be accepted? Mr. J. S. SARGENT's *Lady Agnes* is so capital a piece of work, it is a pity there are not more examples by the artist in the exhibition. The late Mr. PETTIE's *W. B. Greenfield, Esq.*, is a proof of unimpaired powers. Mr. ALMA-TADEMA's *Dr. Joachim* is excellent as regards the head, but the hands appear not so true to nature. The *F. Seymour Haden, Esq.*, by Mr. JACOMB HOOD, may be a posed portrait, but from the skill with which the expression of the moment is recorded, the subject appears far less stiff, obtrusive and uncomfortable than those which are assumed to be taken unawares. Mr. OULESS is as vigorous as ever in his *Sir Charles Tennant*.

INDIAN HANDICRAFTS.*

THE term "manufacture" may be taken as meaning the transformation of an original substance, by the dexterity of manual labour, into articles for the use of man. The motive-power may be the deft fingers of a Dacca damsel or the steam-engine of a cotton-mill, and the article produced may be a pin or a steam-engine, a sheet of paper, a wine-glass or miles of cloth. In each case the process of manufacture has to be gone through; but, as Sir George Birdwood has truly observed, "in Europe the word 'manufacture' has come at last to lose well nigh all trace of its true etymological meaning," and is now generally applied to articles made by machinery. In considering, however, the subject of Indian manufactures, it is impossible to omit a brief examination of the numerous handicrafts and art industries which would not perhaps now come under the ordinary acceptance of the term "manufactures." From time immemorial India has been famous for its productions of this kind. Mechanical labour, aided by a well-trained eye and delicacy of touch—the result, probably, of hereditary instincts—has produced beautiful examples of handicraft. The embroidery and leatherwork of Kattyawar are spoken of by Marco Polo, in the fifteenth century, as "marvellously beautiful things." "The inhabitants," he says, "are good people, and live by their trade and manufactures." At a less remote period, but at a time when communication was not only imperfect, but was accompanied by risk and danger, the spirit of enterprise visited India and opened to the Western world the riches of its art industries. Its metal and ivorywork, its shawls and embroideries, its carpets of cotton-wool and silk, found their way to this country, and "argosies with portly sail" traversed the Western seas. The same patterns and the same designs have existed for years, and in particular localities and amongst different families and castes, and whatever their origin may be they show a genius for composition and arrangement of colour which is the admiration of all lovers of art. "The Indian workman," says Sir George Birdwood, "from the humblest potter to the most cunning embroiderer in blue and purple and scarlet, is not the less a true artist, although he seldom rises above the traditions of his art." It is most desirable that these art industries should be preserved and kept pure and uncontaminated. With the best intentions harm has sometimes been done by attempting to graft Western ideas upon Eastern designs, whereby purity and harmony have been converted into crudeness and deformity. I do not mean to say that East and West may not learn something from each other, but great discrimination and pure taste are necessary for success in the technical instruction given in our Indian schools of art, and it would be well to raise and stimulate this class of employment by encouraging those who show a decided aptitude for art to pursue it in preference to

* From the paper on "The Manufactures of India, their State and Prospects," read by Sir Juland Danvers at a meeting of the Indian Section of the Society of Arts.

quill-driving and book-keeping. The metalwork, the pottery, the inlaid woodwork, the embroidery, exhibit a variation in shape, colour and pattern which have been for years identified with different localities and castes. It is not easy to trace how these industries were first established. In some cases it was probably accidental; in others it was due to the migration of a family of experts from distant parts, and sometimes perhaps to an inventive genius springing up or to suitable material being found in the neighbourhood. Persia was no doubt the source from which many of the artistic devices which characterise Indian workmanship came.

In May 1884 Mr. Baden Powell gave this Society an interesting account of some of the handicrafts and art industries of India, especially those carried on in the Punjab, and described the characteristics of Indian labour in various parts of the country. He showed that some of the work executed could be traced to a Mohammedan origin, while others contained evidence of Hindoo ideas and feelings. He viewed the subject very much from an artistic point of view, and explored a field in which he has personally done much good service. I do not propose to go over the ground which has been so well covered not only by Mr. Baden Powell, but by Sir George Birdwood, Mr. T. N. Mukharji and Mr. Forbes Watson. Nor will it be possible, within the scope of this paper, to do more than notice briefly the principal industries of the kind referred to.

Allusion has been made to the choice fabrics of cotton, silk and wool which centuries ago adorned the houses of the rich in India, and found their way to Europe, but besides this high class of textile products, ordinary articles of clothing were produced from the village spinning-wheels and looms. These home industries have continued from very remote periods, but have during the last fifty years been greatly interfered with by the cheaper cotton goods imported from England. An additional competition has now sprung up in India itself, and it cannot be doubted that the machine-made textiles will gradually cause the hand-made cloths to diminish. This result is of course inevitable in every country where progress is being made. It is said that the fabrics produced by the village looms are of greater strength and better quality than those made by machinery, so that a supply may be continued to those who are ready to pay a higher price for a superior article.

One of the first fabrics weaved from Indian cotton, which will occur to everybody, is muslin. The beauty and lightness of Dacca muslin still holds its pre-eminence, although its sale is now very limited. The fineness of its texture is described by the well-known names of "Evening Dew" and "Woven Air," and is proved by the traditional test of passing twenty yards of it, one yard wide, through a lady's wedding-ring. It has been said that the fingers of the women by whom it is spun are losing their cunning, but a very fine fabric is still made, being used only by the rich and noble. The greater the length and number of threads, and the less the weight of the piece, the higher is the price. The lower qualities, used for turbans, veils and clothing, have generally been superseded by the machine-made article from Europe. The antiquity of Indian muslin is traced far back by Sir George Birdwood, who is of opinion that in the time of the Chaldeans it was carried into Babylonia as a regular article of trade, and that cotton also, in the form of the Arabic tunics, became known to the Greeks before the age of Homer. The word "cotton" does not appear in the Old Testament, but Sir George Birdwood, with his knowledge of Hebrew and Sanskrit, is able to point out the interesting fact that the passage in Esther (chapter i. verse 6) which runs, "Where were white, green and blue hangings fastened with cords of fine linen," should be rightly translated, "Where were white and blue (striped) cotton hangings."

Calico, like muslin, was in times past much thought of in England. It is supposed to have been first introduced from Calicut, from which place it derives its name. Its texture and printed patterns were the admiration of our great-great-grandmothers, and it was much worn for dresses in this country, so much so that it alarmed our silk-weavers, in whose interests a law was passed in 1721 prohibiting the use of printed calicoes. Fifteen years afterwards this was modified so as to admit of their being worn, "provided the warp thereof was entirely of linen." They had their day, but were ultimately superseded by the machine-made stuffs of England, and these have in a great measure also displaced the hand-loom fabric in India itself. A common kind is still made there, and the day may again come when the wheel of fortune will enable it to take a larger place in the Indian market.

Silk has for a long period been made and largely used in India, and in former times silk fabrics were exported to Europe. There has, however, always been difficulty in cultivating the domesticated mulberry-feeding silkworm. More than a century ago the East India Company made efforts to introduce the Italian system; but while improvements were made in the filature the experiments ultimately failed, apparently from the climatic effects upon the mulberry tree, and the silk industry became dependent for its native supply on the

wild insect. The fabric thus produced is known as the Tasar silk. The trade in Indian silk is now small. In his last report Mr. J. E. O'Connor speaks in a desponding tone as to its decadence. "It is clear," he says, "that Indian silk is not able to hold the market: our exports to foreign countries amounted to little more than half the imports." Most of the manufactured article is made from the raw material imported into Bombay and Burma from China and Europe. I would venture to express the hope that the present condition of this industry should not produce despondency, and that it will still be thought worth while to apply skill and science in overcoming the physical difficulties of cultivation.

To pass from silk to embroidery is a short step, silk brocades forming the foundation for some of the most beautiful specimens. Few articles of Indian ware excited more admiration at the various international exhibitions that have taken place than the *kinchâbs*, the horse-trappings, the *kârehobs* and *jémdanis*. It is truly an art industry, brought to perfection by the richness of the material used, as well as by the beauty of the patterns and the harmony of colours. It is surprising that, with our growing love of decorative art and our improving tastes, more of this kind of ornamentation is not seen in our halls and reception-rooms.

Carpets, on the other hand, have found their way into English homes and are very generally used. In former times a specimen here and there, more often in the shape of rugs than full-sized carpets, might have been seen in houses connected by association with the East, but after the exhibitions of 1851 and 1862 a considerable trade was started, and has continued. They are made of cotton-wool, silk, goat's hair, and these materials mixed, and are hand-woven, seamless, and of various sizes. They, of course, vary in quality and price, but, as in most things, the best are the cheapest in the end, from their durability, elasticity and softness. Carpet-making is a large gaol industry, but there are private manufactories in various parts of the country. Competition, and the demand for a cheap article, have not been without ill-effects. Attempts are sometimes made to graft European ideas upon Eastern patterns, and the result is always disastrous. The use of inferior dyes has also become too common. The manufacturer and the customer should be strenuously warned against these injurious processes, and be persuaded that, if the industry is to flourish, its character for pure design and good workmanship must be maintained.

In many places gold and silver are turned into ornaments and into articles of use for the table. While some are beautifully chaste, others are only rudely finished, and are more curious than pretty. In addition to trays, goblets, plates and bowls, the articles peculiar to India are the rose-water sprinklers, hukkas, betel boxes, water vessels, &c. The places most famous for gold and silver work are Cashmere, Lucknow, Cuttack, Rajputana, in Northern India; Ahmedabad and Cutch in the Bombay Presidency; and Dindigal, Madura, Arcot and Cochin in Madras. Burma also has not neglected the art. The work is as various as the places, each having its distinguishing feature. Speaking generally, and comparing Indian with English plate, while recognising the beauty of its form and pattern, there would appear to be a want of finish, and as we know from the sad demolition which often took place when brought into this country, too large an ingredient of alloy. The removal of the import duty, and the regulations with regard to hall-marking will, it may be hoped, not only have the effect of improving its quality, but of increasing the desire to make it as perfect as possible.

Gold and silver ornaments, jewellery and trinkets of all kinds, filigree work and wire-drawing decorations, are made in most towns of India. The love of the native for personal adornment, and the means of hoarding provided by the conversion of the precious metals into ornaments for various parts of the body (the head, nose, ears and ankles), create a local demand which employs a large number of people. Jewellery, like plate, generally needs the finishing touch to bring it up to the European standard, and precious stones are thought more of for their weight than brilliancy. The cutting of gems is thus sparingly exercised, and a polish is considered sufficient. It will be recollected that the *Koh-i-noor* was, after its arrival in this country, on the advice of competent judges, ordered by the Queen to be recut, and that, although reduced in weight from 180 to 102½ carats by the operation, its brilliancy was greatly intensified; and that, in the words of Mr. William Pole, it became "what it never was before, a most splendid jewel, worthy of its royal mistress, whose unsullied diadem may it long adorn."

Brass and copper are largely used for vessels of domestic use, as well as for ornaments and personal decoration. The industry is an important one, and much skill and ingenuity are applied to the work. The Hindoos are said to prefer brass and the Mohammedans tinned copper for their cooking utensils. The Benares brass ware, with its bright shimmering surface, is now well-known in this country. It is said to have been imitated at Birmingham, and that the ignorant and

unwary have been caught by it. The Indian ware is worked out by the skilled artificer, who, with a simple hammer in one hand and a pointed instrument in the other, engraves, without any pattern or tracing before him, the design which is in his head. In Lucknow, Delhi, Moradabad, Amritsir and other towns in the North-West Provinces and the Punjab, as well as places in the Central Provinces, Rajputana, Madras and Bombay, the metal industry is carried on. In fact, all over India the aptitude of the native in this department of industry is exemplified.

There are other crafts, some almost unique in their character, such as enamelling, lacquer-work, inlaid work, stone and wood-carving, ivory-carving, which it is impossible to do justice to in the limited space of this paper. The same may be said of pottery and glass, which have existed from early times and are still pursued. I must refer my hearers to the excellent work of Sir George Birdwood on "The Industrial Arts of India," as well as to Dr. Watt's valuable "Dictionary of Indian Products," and the interesting accounts by Mr. Baden Powell, Mr. J. L. Kipling, Sir Edward Buck, Mr. Purdon Clarke and others of the industries of various districts. To the labours of these gentlemen in the country itself, and to their instructive reports, we owe the knowledge we now possess on the subject, and to the same cause is due the preservation of what is good, and the introduction of improvements in the arts themselves. I would also recommend a visit to the well-arranged collection of specimens of work in the Indian Museum at South Kensington.

It will be seen that the handicrafts above mentioned constitute an important part of the large earning industries of the country. They are important as well for the higher occupation they provide as for the artistic character of the work performed. It is true that imitation more than originality and individuality is brought out, but there is an undeniable charm in the general results produced. What is meritorious should be preserved and made the foundation upon which improved appliances and an instructed intelligence may build a useful and profitable superstructure.

THE NEW PARLIAMENT BUILDINGS OF ONTARIO.

THE new Parliament Buildings at Toronto have been opened. It naturally occurs to us in chronicling the event, says the *Canadian Architect*, to consider what sort of bargain the people of Ontario got for their 1,200,000 dols. odd.

The general scheme seems proper. The Legislative Chamber is in the centre, over the main entrance and approached by the grand staircase. This gives the central motive which, from its singleness of purpose, lends itself to effective composition on the exterior. The offices of the Legislature and of the departments extend on each side of the centre and along wings which return northward, finishing with a stack of lavatories at the end of each. That is the plan in simple, and it seems a straightforward plan in the usual manner of public buildings where a general scheme rules, and rooms are apt to be proportioned by position rather than use. But in the main feature of the interior arrangement there has been a judicious expenditure of space which makes the inside of the building fine, and is worthy of all praise. The grand corridor which runs the entire length of the building from east to west, is made of sufficient width to have on each side of the central portion (where the grand staircase landing intervenes) a space open from the ground floor to a skylight in the roof. The passages of the upper floors thus take the form of galleries at these points, and on the ground floor the corridor has on each side a colonnade which supports these galleries and their arcades. The colonnades, the open space, the light from above, all combine to redeem the corridor from the dark and dreary monotony that is so often all the architectural effect presented by the passages of a great public building.

Thus far we may perhaps assume the architect, but we are afraid it is too obvious that the person with whom we have had to deal for the carrying out of the plan is not so much the architect as the architect's draughtsman. We have no doubt the draughtsman did his best, we would impute to him nothing but righteousness, but surely the architect's commission was sufficient to afford a draughtsman who could design. In this same corridor which we have described there is but one set of columns to be repeated along the whole colonnade. The detailing was limited, and with a little careful study in the hands of one who knew something might have been carried to perfection and made the whole corridor beautiful where now the details are poor on the ground floor and offensive in the upper storeys. On paper this essay of an apprentice in columnar details would be something to smile at, but that they should be actually erected in an important public building is a matter rather for indignation. The same may be said of the grand staircase. It starts fairly well in iron and slate, but above, where we get to the region of arcades, and what we may suppose to be

intended for an ornamental ceiling, the draughtsman's efforts should not have been allowed.

The Assembly Chamber, the grand piece of the design, shows more skill in the designer, but we are afraid cannot be said to satisfy good taste. There is some well executed wood-carving on the floor of the House which really gives pleasure and is of the more value as being different in type from the style we have become accustomed to of late years.

Of the exterior we are afraid there is little good to be said beyond praise of the material. It is a fine mass of Credit Valley brown stone, and as such cannot but look important. It is not, however, of meanness we have to complain. The central pavilion with the main entrance, the 16 feet unmulioned windows of the Legislative Chamber above, and the enormous roof which crowns it, is certainly striking. But its proportions are swaggering rather than dignified. Perhaps its self-assertion may be intended to represent the idea of provincial autonomy, but we must confess we should have preferred to have complimented the idea by representing it with a little more of the dignity of beauty.

The roof of this central pavilion is a fine and bold erection, but it seems to us a pity that it was not constructed of iron, so as to save at least the danger of fire originating within its own limits. As it is, being a forest of timber above the highest cast of the hose, its existence is a menace to the public documents below, and the public may perhaps some day wish it were away. As for the other roofs, we must candidly say we wish they were away now, especially the eccentric hipped roofs with glass tops over the main building on each side of the centre. They must form capacious snow traps at the junction with the other roofs. But our discontent is chiefly with the question of beauty of form, and with the draughtsman's apparent indecision as to what pitch to adopt. If the buildings had been planned for a long ridge instead of these pyramidal forms with glass apexes, the front would have been much helped, and the glass might have shown only on the rear—the long suffering but picturesque rear.

But the glass is a friend giving the top lighted corridors within, and we should have been glad to see more of it if the architect had availed himself of it to a greater extent so as to reduce the size of the windows on the façades. It is these which really spoil the building. They have not even practical advantage to recommend them. The corridors are lighted chiefly from the top, and could be given more light from that quarter and from the rear. For the offices themselves, windows of such a size are a great discomfort. The mere operation of lifting a sheet of glass 9 feet wide is found to be troublesome. In winter the rooms must be pervaded by the sun to a painful extent, and in summer also it will probably be necessary to keep the blinds down and exclude air as well as sun. With windows on a more reasonable scale there is more chance of compact and well arranged planning of the offices, as there is greater freedom offered for the disposition of partitions. The draughtsman too, with more reasonable windows, might have suffered less defeat on the exterior. As it is he has been unable to make anything of it. The conditions were hard, and he does not seem to have been skilful. Where he erred he erred no doubt from ignorance; but this same ignorance, how much has it cost us? Draughtsman is writ large all over our greatest and most costly public building.

THE ART FOR SCHOOLS ASSOCIATION.

THE annual meeting of the Art for Schools Association was held on Monday at the offices, Queen Square, Bloomsbury, Cardinal Vaughan presiding. The Association was founded in 1883 with the object of supplying an educational basis for the work already being done by loan exhibitions of pictures in poor districts of London and other large towns. The idea of the founders was that much might be done to educate and feed the taste of children by simply placing in the classrooms of elementary schools a few good prints and photographs of beautiful and interesting works of art, such as people of taste cared to have in their own houses. The chief work of the Association is to supply elementary schools with works of art at a nominal profit, and a very large number of schools have already availed themselves of the facilities offered. In opening the proceedings, his Eminence stated that the work which had been done by the Society was one of very considerable importance and deserving of a very much wider support than it had hitherto received. In the work of education there were two kinds of influences, the supernatural and the human, and however much people might differ on questions affecting the form of religion, they were mostly agreed that both these influences were essential in the education of youth. Art might be used on both the religious and the profane sides of education, but in either sense it was elevating and refining, provided it was high and worthy art. A debased and sensual art would have a detrimental effect upon the morals of the younger generation, and an ennobling art would have an ennobling effect. He might indeed say, "If you will tell me what is your

art, I will tell you what is your state of civilisation and refinement." The adoption of the report was moved by Mr. Armine Willis, seconded by Mrs. Westlake, and agreed to.

TESSERÆ.

Russian Churches.

THE belfry belonging to the more ancient Russian churches, wherever such a building exists at all, is always insulated and often removed to such a distance from the nave as to appear a totally independent structure. In the course of the seventeenth century, it became customary to place it invariably on the western side, and to connect it with the body of the church (to which its lower storey afforded a species of vestibule) by a passage of moderate length. Thus, by means of this passage and vestibule to the west, and of the sanctuary which projected at the opposite extremity to the east, the ground-plan of the whole building was made to assume the shape of a cross, which was soon modified into a form little differing from that of our cathedrals. The connecting passage was enlarged till it became the most considerable portion of the church. The ancient square nave acquired by this alteration the appearance of a transept, while the sanctuary alone was suffered to retain its former proportions, having never been sufficiently expanded to admit of a comparison with a Latin choir. Evidence of this change may be traced in many of the smaller churches at Moscow, particularly in that near the Kunetskoy Most. During the reign of Peter the Great, Russian church architecture was still further deprived of its original and national character by the general adoption of the classical orders, which became fashionable at that period. The bulbous cupola likewise, though never altogether laid aside, began at the same time to fall into comparative disuse, and was replaced by an overgrown dome of the Italian form, which, being painted green, is, at present, the never-failing head-piece of every modern Russian church. An ancient but tasteless custom was injudiciously retained of degrading the exterior architecture by the application of bright and incongruous colours, which though sufficiently suited to the irregular and barbaric structures of the Muscovite Tsars, but ill accord with the classical elevations of so young a city at St. Petersburg.

Giulio Romano as an Architect.

While St. Peter's was still in progress at Rome, Giulio Romano, the first scholar of Raphael, was employing his great talents as an architect as well as a painter for the ornament of the city of Mantua. No town was ever probably so much indebted to a single individual. The interior of the cathedral is a monument of his genius. This church consists of five aisles, or seven including the side chapels. That in the middle is of two storeys, the lower of fluted and reeded Corinthian columns, the upper of Corinthian pilasters, with the entablatures unbroken. The ceiling of this aisle is flat, of the two on each side of it semicircular, and of the two outer aisles flat again. These side aisles are separated from each other by columns like those of the middle aisles. It has a handsome dome and a handsome chapel with another cupola, but it is not certain that the latter was designed by Giulio Romano. The front of his own house is of a simple and singular architecture, but productive of good effect. He was not free from the affectation of singularity and from a wish to innovate, but his innovations are quite his own; unauthorised by precedent and unadopted by others, though they have injured some of his own buildings they have not been prejudicial to those of others. Some of them are to be seen in the Palazzo del Te, particularly a sort of subsidence in a Doric frieze, which gives it an appearance of weakness, as inconsistent as possible with the character of the order and very displeasing to the eye. There is an arcade in this palace, supported by a sort of pilaster, formed by four Doric columns together, which has an extremely good effect; perhaps he may have been indebted for the idea to the clustered columns of the Gothic architects.

Art and the Artist.

If illusions are necessary to happiness, no folly can be greater than to know both the workman and his work. Yet there is an age for most men when illusions are powerless, and when truth, however harsh, can be reconciled with older truth. The fact is, that the work is both greater and less than the workman. It is less, because no result in this world is as grand as the conception in the author's mind. It is greater, because no mind can conceive a result together with the details that compose it. The work must have details, the mind conceives only the whole. Again, the work often makes the workman. The very first details to which he must descend suggest new ones to which he could never have ascended else. From detail to detail he modifies his first conception, and the very work itself reflects upon his mind, and flashes new lights into it. We will venture to say that no author ever wrote a good book in exactly the manner that he had first planned it, and no good

picture was ever painted to realise accurately the first picture in the artist's mind. The work, then, is often greater than the workman; and hence it is that we are so grievously disappointed when we come to look into the lives and characters of great artists. If this be true for all art—if we find Milton the prejudiced organ of a party, and Shakespeare the hero of the "Mermaid," it is still more true for imitative arts. In these particularly the mind of the workman has a materialist tendency. The difference between the poet and the painter is this, the one ascends from the material to the ideal, the other descends from the ideal to the material. The one robes the things of earth in a heavenly light, the other steals the fire from heaven to show it bodily to men. The one is the lark soaring, the other the lark falling. It is true that you must soar before you can fall, but then you do fall. The clouds will hold the poet, but only the earth will satisfy the artist. Words may combine to form ideas beyond the common associations, but pictures of form can only appeal to the commonest associations.

The Tomb of Mohammed.

The Hujrah, or "Chamber," as it is called, from the circumstance of its having been Ayisha's room, is an irregular square of from 50 to 55 feet in the south-east corner of the building, and separated on all sides from the walls of the mosque by a passage about 26 feet broad on the south side and 20 on the eastern. This isolation is explained by a saying of Mohammed, "O Allah, cause not my tomb to become an object of idolatrous adoration. May Allah's wrath fall heavy upon the people who make the tombs of their prophets places of prayer." Inside there are, or are supposed to be, three tombs facing the south, surrounded by stone walls without any aperture, or, as others say, by strong planking. Whatever this material may be, it is hung outside by a curtain, somewhat like a large four-post bed. The outer railing is separated by a dark narrow passage from the inner one, which it surrounds, and is of iron filigree painted of a vivid grass green, with a view to the garden, whilst carefully inserted in the verdure, and doubly bright by contrast, is the gilt or burnished brasswork forming the long and graceful letters of the Suls character, and disposed into the Moslem creed, the profession of unity and similar religious sentences. On the south side, for greater honour, the railing is plated over with silver, and silver letters are interlaced with it. This fence, which connects the columns and forbids passage to all men, may be compared to the baldacchino of Roman churches. It has four gates: that to the south is the Bab el Muwajjah; eastward is the gate of our Lady Fatimah; westward the Bab el Taubah (of repentance), opening into the Rauzah or garden, and to the north the Bab el Shami or Syrian gate. They are constantly kept closed, except the fourth, which admits, into the dark passage above alluded to, the officers who have charge of the treasures there deposited and the eunuchs who sweep the floor, light the lamps and carry away the presents sometimes thrown in here by devotees. In the southern side of the fence are three windows, holes about half a foot square and placed from 4 to 5 feet above the ground; they are said to be between 3 and 4 cubits from the Prophet's head. The most westerly of these is supposed to front Mohammed's tomb, wherefore it is called the Shubák el Nabi, or the Prophet's window. The next, on the right as you front it, is Abubekr's, and the most easterly of the three is Omar's. Above the Hujrah is the Green Dome, surmounted outside by a large gilt crescent springing from a series of globes. The glowing imaginations of the Moslems crown this gem of the building with a pillar of heavenly light, which directs from three days' distance the pilgrim's steps towards El-Medinah. But, alas! none save holy men (and perhaps odylic sensitives), whose material organs are piercing as their vision is spiritual, are allowed the privilege of beholding this poetic splendour.

Sir Peter Lely.

Captain Van der Faes was born in a house at the sign of the Lily in the town of Soest, in Westphalia, and hence obtained the sobriquet of the Captain of the Lily. So goes the story which accounts for the more graceful synonym of his son Peter. This son was born in 1617, and placed in due course in the studio of Grebber, at Haerlem, where Nicholas Berghem, the landscape painter, and Egbert Hemsckerck, the devil painter, were his fellow students. Lely himself began, like Reubens, with landscape—a study which enabled him to give to his portraits in after life those charmingly unnatural accessories which have remained in fashion in this country almost to this day. Following his master, Lely next turned to historical painting, but was not very successful. The best of his pieces, according to Dr. Waagen, is the "Susanna and the Elders" at Burleigh House. But in 1641 he came to England, and finding that portrait was about the only branch of art patronised here, he turned his attention to that style, for which he has since become so famous. In this country he settled in spite of the civil war, survived the Commonwealth, and charmed the second Charles with the voluptuousness of his female figures. The king employed him to paint—on canvas—his mistresses and

the ladies of his court, in dresses as loose as their characters. Sir Peter made beauties of these frail creatures and gave to each a tender expression of languishing innocence, which in nine cases out of ten must have been pure flattery. But as works of art the contents of the room at Hampton Court are unsurpassed by any female portraits of any other master. Nothing can exceed the softness of the flesh, nothing the grace of attitude, nothing the richness of colouring and freedom of design which these beauties display. Few women are impervious to delicate flattery, and those who graced or disgraced the court of Lely's patron were not among the minority. Sir Peter had therefore no battle of life to fight here, but made a rapid and enormous fortune. He collected a magnificent gallery, partly from the remains of the Arundel and Buckingham collections, which sold after his death for 26,000*l*. He amassed sufficient to leave besides this a landed estate worth 900*l*. a year, though he had always lived well. He died suddenly of apoplexy in 1680, and Gibbons carved the monument which was raised over his remains in Covent Garden. If his proneness to flattery extended to the portrait he painted of himself, he must have been one of the ugliest men of his day. In character he appears generous and liberal, but intensely jealous of other painters, particularly his own pupils, from whom he concealed the most precious secrets of his art.

The Progress of Architecture.

Art, if it be a thing of life, must be in a constant state of advance, whether it be to maturity and excellence or to decrepitude and decay. It cannot have a retrograde movement; the attempt would only be attended with ridicule and failure. Possibly its fate may be retarded for a time; an honourable old age and a glorious death may be insured for it. It may be embalmed with regrets and reverence done to its memory, but it cannot be recalled to life, reproduced as it was, with the same features, nerves and sinews. The phoenix must die and be consumed. A more beautiful offspring may arise from her ashes, and may resemble and remind one of her lost parent; some of her lineaments may be traced, some of her transmitted energies witnessed, but the identity is gone; the new life implies a new individuality. The lost is not restored but succeeded. The generations of man may see hundreds of successive Gothic styles spring and decay, but none of them will be the Gothic of the thirteenth and fourteenth centuries; and they will be attained, not by retracing one's steps and professedly imitating what is past, but by constant progress. Anything that is gained by a retrograde movement will prove to be without life, value or reality. There is a vast difference between the imperfections of a man who is doing his best and constantly striving to do better, and those of one who purposely sets before himself a lower standard than has been reached, and that he knows can be reached. The former is looked upon with indulgence and respect; the latter with contempt. What shows earnestness in the one is a proof of affectation in the other. And therefore the savageness which Mr. Ruskin points to as the first and most characteristic feature of genuine Gothic, and as giving it the true stamp of nobility, is just the one that cannot and must not be attempted to attain unless it be by setting up a higher standard than any hitherto reached, and then the same causes may produce the same effects and still more noble and powerful. If art is progressive an increasing eagerness for perfection must be a necessary and natural condition. An attempt to check it is an attempt to check nature. Unquestionably it contains not only the nourishment of excellence but the germs of decay. It is well known that there is a point beyond which refinement will detract from beauty and power; but if art and society are in a constant state of progress they will not stop at that point: they will either proceed till over-refinement has weakened them beyond power of self support, or else they will transfer their care to some branch which has not yet received it to the same extent. And when these changes have taken place just at the right time and been made just in the right direction, an excellence has been reached little short of supernatural.

Colour Vision.

When we look at a broad field of uniform colour, whether it is really simple or compound, we find that the sensation of colour appears to our consciousness as one and indivisible. We cannot directly recognise the elementary sensations of which it is composed, as we can distinguish the component notes of a musical chord. A colour, therefore, must be regarded as a single thing, the quality of which is capable of variation. To bring a quality within the grasp of exact science, we must conceive it as depending on the values of one or more variable quantities, and the first step in our scientific progress is to determine the number of these variables which are necessary and sufficient to determine the quality of a colour. We do not require any elaborate experiments to prove that the quality of colour can vary in three and only in three independent ways. One way of expressing this is by saying, with the painters, that

colour may vary in hue, tint and shade. The finest example of a series of colours, varying in hue, is the spectrum itself. A difference in hue may be illustrated by the difference between adjoining colours in the spectrum. The series of hues in the spectrum is not complete, for, in order to get purple hues, we must blend the red and the blue. Tint may be defined as the degree of purity of a colour. Thus bright yellow, buff and cream-colour form a series of colours of nearly the same hue, but varying in tint. The tints corresponding to any given hue form a series, beginning with the most pronounced colour, and ending with a perfectly neutral tint. Shade may be defined as the greater or less defect of illumination. If we begin with any tint of any hue, we can form a gradation from that colour to black, and this gradation is a series of shades of that colour. Thus we may say that brown is a dark shade of orange. The quality of a colour may vary in three different and independent ways. We cannot conceive of any others. In fact, if we adjust one colour to another, so as to agree in hue, in tint and in shade, the two colours are absolutely indistinguishable. There are, therefore, three, and only three, ways in which a colour can vary. We may determine the number of quantities upon which the variation of colour depends by means of our ordinary experience alone. If we wish to specify the position of a point in a room, we may do so by giving the measurements of three distances, namely, the height above the floor and the distances from two walls forming an angle. This is only one of many ways of stating the position of a point, but it is one of the most convenient. Now, colour also depends on three things. If we call these the intensities of the three primary colour sensations, and if we are able in any way to measure these three intensities, we may consider the colour as specified by these three measurements. Hence the specification of a colour agrees with the specification of a point in the room in depending on three measurements.

Imitation in Painting.

The experience of every artist has suggested to him the difficulty of defining for himself the true standard or quantity of imitation which should in any given case be employed for the fitting representation of the object or objects which he has in view. At the commencement of his career the student is apt to be influenced by the desire to mark down all particulars which to his eye make up the sum of the thing before him, and as at that age the artist is an almost microscopic observer, a study which might well befit the naturalist becomes in its rendering of specific fact a fatigue to the sense to which it appeals as a work of art. The end is, in fact, missed through the very over-elaboration of the means. It is this habit of seeing too much, through want of taste or of judgment, that makes a portrait painted by a beginner so little satisfactory. Not contented with so much of imitation as shall secure identity with the type, he has insisted on details as punctiliously as a surveyor might, whose task it was to make a chart of the face. He has mistaken a picture for a map. That simplicity, not complication, of means serves the purpose of identification in form is illustrated by a fact in every man's daily experience, the facility with which at a distance or amid a crowd we distinguish a well-known figure or face. In the first of these cases the facts are resolved by the distance; in the second they are generalised by the numbers in which the mere technical particulars are to some extent the same or similar. In both it is shown that the individuality is something outside of or added to the facts, and this it is which the painter has to seize, as by a few expressive lines he often may. To borrow an illustration from the arithmetician, the likeness is the resulting whole which expresses, as it were, in a single line the sum of all the several figures which are its factors, not a precise repetition of all the figures which make up that whole. The process of art-imitation is synthetic, not analytic. The amount of character which a few forms are capable of expressing is well illustrated also in the breadth of treatment and simplicity of means employed for portraiture by the Egyptian sculptor 3,400 years before the Christian era, as well as in some of the historic themes of the same people. The like principle of simple means was eloquently applied to the decoration of the Etruscan vase, a few lines by means of which a variety of condition, age, sex, &c. are expressed and recognised in forms of beauty, of grace or of motion. In the flattest or lowest relief of Greek sculpture everything is almost reduced to outline. Patient investigation and that experience which implies the combination of judgment with taste must be employed to determine in each case, by comparisons with a number of objects in the same class, what are the essential peculiarities that constitute its character, standard or true type. There are certain specific attributes peculiar to each object either in form, in character or in colour, and the central or focal point of these is its essence. Divergence from this constitutes variety—exaggeration of it, caricature. This essential form it is which the artist must seize. When this is expressed in his work the idea of that work is complete.

NOTES AND COMMENTS.

THE Musée Carnavalet in Paris has interest for all lovers of French literature, especially of one period. The house itself was occupied for about twenty years by Madame DE SEVIGNÉ. There is much in it which relates to the seventeenth century, of which she was one of the ornaments. In fact, the Musée at present suffers from overcrowding, and many objects which should be seen there have to be sent elsewhere. With all its shortcomings the Musée Carnavalet is the most fitting place for a stranger to study relics of old Paris. M. COUSIN, the conservator, has formed plans for the extension of the Musée. But the adjoining building, which is in a similar style and could be readily and economically adapted for use, is now to be appropriated for a lycée de jeunes filles. It may, therefore, be assumed that for the present all hope of an extension has vanished. Probably the authorities contemplate the foundation elsewhere of a musée of Paris, ancient and modern, for which the collections could be utilised. But in that case the interest derived from association must be lost.

AMERICA is the land of storms, and the Chicago Exhibition buildings have been tested by them during the winter and spring. Less than a month ago there was a gale which, for forty-eight hours, advanced at the pace of sixty miles an hour. The buildings, however, withstood it very well. Strange to say the tendency of the glass was to fall outwards, and some of it even was blown back into the building. In order to protect visitors from injury by falling glass Mr. BURNHAM, the director of works, has decided to make use of 1,045,000 square feet, or about 24 acres, of wire netting, to be placed under the roofs of the four main buildings. The netting to be used will have a 2-inch mesh and consist of No. 18 wire. Tests were made with sheets of glass dropped 12 feet upon the netting without perceptible effect upon the screen. It is proposed, however, to place the netting only one foot below the glass. The amount of netting in the principal buildings will be:—Manufactures and Liberal Arts, 600,000 square feet; Machinery Hall, 170,000 square feet; Agriculture, 145,000 square feet; Fine Arts building, 130,000 square feet. The arrangement is novel in exhibition buildings, but it is often employed in American railway stations.

THE relation of builders to sub-contractors was exemplified in a case which was heard in the Crewe County Court on Wednesday. The plaintiff, a builder, superintended alterations in a house belonging to Lord TOLLEMACHE. The defendants obtained the contract for painting, &c., which amounted to about 700*l.* As the money for payment passed through plaintiff's hands he claimed 34*l.* 17*s.* 6*d.*, being commission at the rate of 5 per cent. One of his witnesses, a local builder, said that when contracts were sub-let it was the custom of the trade for the first contractor to receive 5 per cent. on the amount of the contracts sub-let. Judge HUGHES said that if it was the custom of the trade he should not allow it to be the custom of the court. He gave judgment for the defendants, but said that they appeared to have made a promise of some commission to the plaintiff. The case is curious, for the plaintiff appeared in two characters, as honorary superintendent (he said the occupier of the house did not pay him) and as first contractor. It is not wise to go through dual performances in an English court, and the plaintiff might have gained his case if he simply appeared as a contractor, although the question would be sure to arise why he did not deduct his commission in the payments.

THE annual meeting of the members of the Liverpool Engineering Society was held on Wednesday. Mr. H. PERCY BOULNOIS presided, in the absence of the retiring president, Mr. ROBERT E. JOHNSTON. According to the annual report there were 240 members of all classes, of whom three were honorary, four life members, 215 ordinary members, eight associates and ten students. The Chairman, in moving the adoption of the report, referred in high terms to the work done by the hon. secretary. The following officers were appointed for the ensuing session:—Mr. H. P. BOULNOIS, president; Professor HELE-SHAW and Mr. A. J.

MAGINNIS, vice-presidents; Messrs. M. C. BANNISTER, J. A. BRODIE, S. B. COTTRELL, G. FARREN, T. L. MILLER, W. E. MILLS, J. MORGAN and E. S. WILCOX, members of the council; Mr. R. C. F. ANNETT, hon. secretary; Mr. COARD S. PAIN, hon. treasurer; and Mr. W. S. BOULT, hon. librarian.

THE sixth annual meeting of the Sheffield Society of Architects and Surveyors was held at the School of Art on Tuesday evening. The retiring President presided, and there were present also Mr. T. J. FLOCKTON, Mr. J. B. MITCHELL-WITHERS, Mr. E. M. GIBBS, Mr. C. HADFIELD, Mr. W. F. HEMSOLL, and many of the members. Notes of apology for non-attendance were received from Messrs. F. FOWLER and J. E. BENTON. The Society appeared from the annual reports to be in a flourishing condition. The classes for the study of design, architectural history and sketching, inaugurated in the early part of the session, under the management of Mr. GIBBS and Mr. J. R. WIGFULL, were attended by several young architects, and supplied a much-needed educational want. A beginning had been made towards the formation of an architectural library. A ballot took place for the election of officers for the ensuing session, with the following results:—President, Mr. E. M. GIBBS; vice-president and treasurer, Mr. J. B. MITCHELL-WITHERS; hon. secretary, Mr. C. HADFIELD; council, Messrs. T. J. FLOCKTON, F. FOWLER, C. J. INNOCENT, J. SMITH and W. C. FENTON. A vote of thanks was awarded to the retiring president, Mr. INNOCENT, for his two years' services. Afterwards Mr. HADFIELD read a paper on "The Church of St. Peter at Rome and the Vatican Basilica," which he had visited during the recent Papal jubilee in February last.

WE are informed by Mr. BURNHAM that among the congresses to be held in Chicago during the exhibition season, under the auspices of the World's Congress Auxiliary, is an International Congress of Architects. The meetings will commence on July 31 in the Permanent Memorial Art Palace, on the Lake Park front of Chicago, near the centre of the city. The object of the Congress is to bring together the architects of all countries for friendly intercourse, comparison of methods and results, and the promotion of their mutual interests in the profession. What is particularly desired from the architects of each country is a clear and graphic presentation of the progress, achievements and special lines of development in architecture. To this end the following subjects have been selected:—Working-men's houses; modern apartment houses; ancient apartment houses; laundries in houses, health effect; kitchens in houses, health effect; modern stables, large and small; responsibility of architects in constructional matters; responsibility of architects as to plans; responsibility of architects in decorative matters; sculpture and architecture; painting and architecture; the client's right to service, as to drawings; ownership of same, specifications and details, as to supervision, &c.; mechanical engineering in architecture, and the architect's responsibility therefor; modern steel construction; fire-proofing of building to date. Mr. ROBERT CRAIK McLEAN, 19 Tribune Building, Chicago, is the secretary for the Congress.

IN the recent numbers of *L'Art* there are etchings after some of REYNOLDS's paintings of children. With such subjects the French artists have to enter into competition with English engravers, whose plates are now very costly. It is most creditable to *L'Art* that so much success has been gained. We must remember that English children differ in type from the French, and it was no easy matter to secure fidelity to subjects which do not correspond with the little ladies that are to be seen in the parks of Paris. The new presentments of REYNOLDS's children should be secured at once by collectors. There are other English subjects among the plates, and *L'Art* is the only French periodical in which the merits of English artists are recognised in a generous manner. This sense of justice is one of its characteristics, for whatever work is described, ancient or modern, in the pages of *L'Art*, it is sure to receive fair-play.

The Architect, May 12th 1893.





THE IMPERIAL INSTITUTE, SOUTH KENSINGTON.
T. E. COLLCUTT, Architect.

INK PHOTO SPRAGUE & CO. 485 EAST HARDING STREET, PETER LANE, E.C.

JOHANNESBURG

For the Johannesburg

Designed by F. J. ...



Elevation to Fraser Street.

12th 1893.

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Elevation to Simmonds Street.

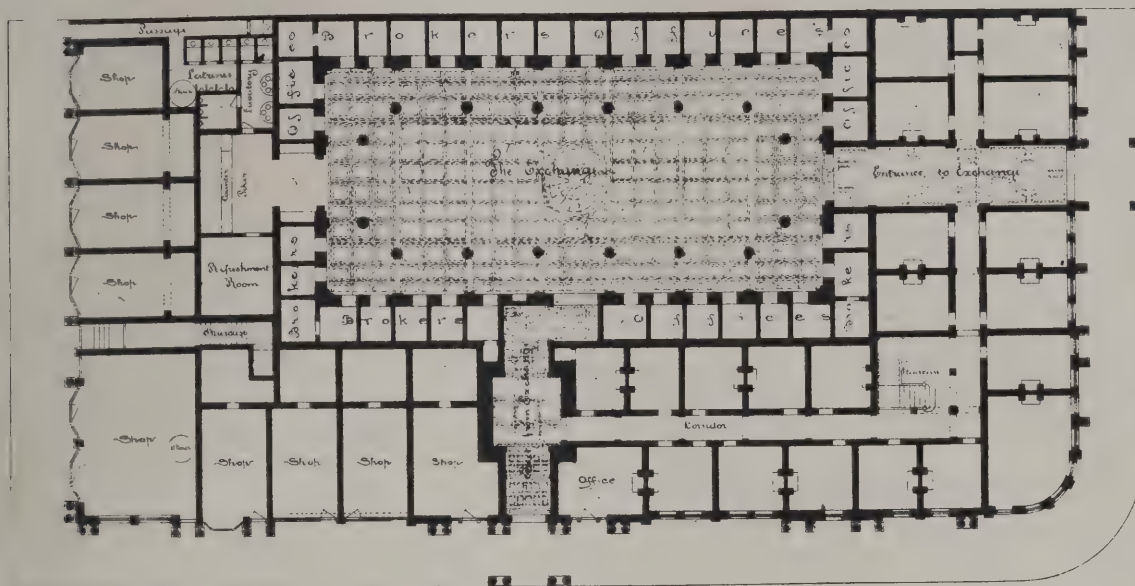
— JOHANNESBURG EXCHANGE

— For the Johannesburg Estate Company Limited —

— Designed by F. Lennox Canning F. S. A. —



— Elevation to Commis



— Ground Floor Plan. —



—
ner Street.

ILLUSTRATIONS.

THE IMPERIAL INSTITUTE.*

IT is not easy with a language like the English to find rhymes that will describe an important building with precision. When, therefore, Mr. LEWIS MORRIS wrote in his ode for the ceremony on Wednesday—

Lo! the airy domes and towers arise
Clear on the vernal skies.

Not of our colder Northern Art sedate,
But lighter, blending East and West in one,
A flower of Fancy quickened by the sun,
Yet keeping still, to guard our Regal state,
The Lions at the gate.

Here, in the stately chambers everywhere,
And corridors with veined marbles, fine, &c.,

we must take the will for the deed, and excuse him if his description is not technically correct. The Imperial Institute can be made a great agent for the welfare of Great Britain and its dependencies. There is no doubt the building is worthy of so important a purpose. That was the general opinion on Wednesday, and there were many who were surprised that the architect's labours were not rewarded by some dignity.

* The illustration is from a special photograph by Messrs. Bedford Lemere & Co.

THE JOHANNESBURG EXCHANGE.

WE publish the design of this building which, with the House of Deputies at Bloemfontein, Orange Free State, designed by the same architect, and already published in *The Architect*, represent the two most important buildings erected in South Africa since the Cape-town Houses of Parliament were constructed many years ago. The greater portion of the building was constructed before the railway reached Johannesburg, and therefore the whole of the materials, except the bricks, had to be carried over three hundred miles of bad roads in waggons. The fittings and furnishings were supplied by well-known English firms, and the work was carried out by Mr. A. L. LAWLEY, of Johannesburg, under the superintendence of the late firm, Messrs. LENNOX-CANNING & GOAD, architects, Johannesburg, now represented by Mr. F. LENNOX-CANNING, F.S.A., architect, Johannesburg, and 5 Copthall Buildings, E.C.

THE IMPERIAL INSTITUTE.

THE formal opening of the Imperial Institute has drawn new attention to the project which the building may be said to embody. It is therefore interesting to recall the history of the Institute, which was ably narrated on Wednesday by the *Times* as follows:—

No one ought to feel more gratification to-day than His Royal Highness the Prince of Wales, to whose unrelaxing efforts the Imperial Institute owes its existence. We have referred to the Institute as the outcome of the exhibition which was opened seven years ago. But, indeed, such an Institute was a cherished project of the Prince of Wales years before the Colonial and Indian Exhibition was thought of; we can, in fact, trace the idea further back still, and one wonders why it has taken so long to assume concrete shape. As long ago as 1851 a scheme for a permanent Colonial Museum was mooted, and a detailed plan drawn out for its establishment on the grounds occupied by the present Institute. Since then the idea has been prominently brought forward on several occasions, specially so in connection with the removal of the India Museum to South Kensington in 1876, when the late Dr. Forbes Watson advocated the establishment of a joint museum for India and the Colonies. Two years earlier the idea of combining within the same building a Colonial and an Indian museum was seriously discussed in high quarters. When in 1874 the proposal to erect an Indian Museum in Charles Street was under discussion, there was sitting at the Colonial Office a Museum Committee for the purpose of providing for the permanent representation in London of the resources of the colonies. These schemes unfortunately came to nothing; the time was evidently not ripe. But to show how firm a hold the project had taken of the minds of our best public men we may quote a passage from a paper dated December 27, 1875, addressed by Sir Erskine Perry to Lord Salisbury. After saying that this was a scheme which had long been germinating in the minds of some of our deepest thinkers in India and the Colonies, he proceeds:—

An institution, in the Metropolis which, with a museum and associated library, shall in the first instance present to the existing genera-

tion an epitome of the various productions, the arts, the clothing, the habits, dwellings and archaic history of the hundreds of millions who owe allegiance to the British Crown would not only be of the greatest assistance to the manufacturing centres of these islands and a mine of information to the scholars of Europe, who are slowly working out the early origin of our civilisation, but, housed in a building of fit architectural proportions, would be a monument to all time of the greatness of England in the latter half of the nineteenth century.

These words were quoted in an article on "The Proposed Imperial Institution" in the *Times* of October 1886, when it was pointed out that "they almost exactly embody the conception of a monumental Imperial Institution to commemorate the greatness of our beloved Queen's reign which is entertained by all who have thought over the subject disinterestedly, in the light of Her Majesty's honour and the best welfare of the Empire, colonies and mother country combined."

The words, indeed, must strike every one as embodying in brief the plan on which the Imperial Institute has been organised. In the same article in which they were quoted a detailed description was given of what, it was suggested, ought to be the lines on which the proposed institution should be worked out, lines which, it is gratifying to state, have been in the main followed.

It is in 1878 that we first find the name of the Prince of Wales associated with the project of a Colonial Museum. This was in connection with the Paris Exhibition of that year. In an address from the Colonial Commission to the Prince as President of that Commission the belief was expressed that—

The erection of a permanent Colonial Museum in London, where the products and manufactures of Her Majesty's most distant possessions might at all times be on view, would diffuse throughout the mother country a better knowledge of the nature and importance of the resources of the several dependencies of the Empire, would facilitate commercial relations, and aid the researches of men of science. It would assist in marking the progress achieved from time to time, and afford valuable information to intending emigrants.

The Prince of Wales gave his hearty support to the proposal, and obtained space at South Kensington for the storage of such goods as the colonial representatives might desire to retain as a nucleus for a permanent collection. Unfortunately, the necessary co-operation and support from the colonial governments were not forthcoming, and the collections stored at South Kensington went to ruin, and were finally mostly carted away as rubbish.

Most naturally, then, the idea of a great Imperial Institute was revived in connection with the Colonial and Indian Exhibition of seven years ago. In the circular letter of the Prince of Wales to the Agents-General, dated November 24, 1884, the possibility of a permanent Colonial Museum growing out of the exhibition was very plainly intimated. As a matter of fact, the exhibition was scarcely opened when the idea of converting the collection into a permanent Colonial and Indian Museum took definite and practical shape. In an article in the *Times* of May 31, 1886, the first announcement of the proposed institution was made. In that article we said:—

"Certainly such an opportunity of founding such an institution may never occur again. No doubt the present collection would require a little weeding and some additions, but that could be easily done. In working out the scheme let the representatives keep steadily in view the good of their several colonies; that is the one object for which a permanent museum should be established. Other points might be decided in the light of the various classes at home for whose enlightenment a Colonial Museum would be of service. From the colonial point of view capitalists and possible colonists, merchants and mechanics should come to look upon it as the great centre for colonial information. At the same time, it should be so attractive as to become a favourite public resort. The institution ought, of course, to be a living one; there ought to be a constant influx of fresh specimens and constant renewal of old ones."

We cannot help quoting the concluding paragraph of that article:—

As to the term museum, it is not a happy one for an institution which will illustrate the living present more than the past, though certainly the past should no more be unrepresented than it is at the exhibition. Unfortunately, the Colonial Institute has already appropriated a more suitable term. How would "Imperial Institute" do? For surely the institution in view will contain much that will illustrate the intimate connection between all parts of the Empire, including the mother country herself.

And "Imperial Institute" it is, as we suggested.

But that was a false start. There were the usual inevitable jealousies and bickerings, and it was only after various compromises had been considered and abandoned that a scheme was finally resolved upon worthy of the object in view and adequate as a memorial of Her Majesty's Jubilee, with which in the end the scheme became intimately associated. Up till the end of October, 1886, under all the phases which the project had assumed, the leading idea of the executive of the exhibition had been to continue the exhibition on the then existing lines;

indeed, at one time it was proposed that the institution should be designated the Permanent Colonial Exhibition. That the representatives of the Colonies were favourable in the abstract to a permanent institution that would display their conditions and resources in all their aspects there can be little doubt, but there was a strong feeling of distrust towards the scheme as proposed by the executive. The continuation of the exhibition, in which the tea-gardens and illuminations, the eating, drinking and philandering had become the prominent features, was certainly not looked upon with favour by those whose support it was indispensable to secure. When the movement became associated with Her Majesty's Jubilee, it took a new departure and was raised to a higher platform. The Prince of Wales took into his counsel the men best fitted to advise him in so important a matter, and the institution which the Queen opened on Wednesday gradually took shape. All idea of reopening the Colonial Exhibition in 1887 was abandoned. It was resolved to make efforts to obtain the large funds necessary to construct a building which, while it would be a worthy monument of Her Majesty's Jubilee, would at the same time be an outward and visible symbol of the great Empire over which she reigns, and illustrate the products, the manufactures, the commerce, the scenery, the people of each section of that Empire. A broad plan for the internal organisation of the Institute was laid down by the influential and representative organising committee in December 1886, and in June 1887, Mr. Colclutt's plans for the building were adopted from among several others. The foundation-stone was laid by Her Majesty on July 4, 1887, and since then the work of building has proceeded steadily. The front of the building is nearly completed, but a good deal still remains to be done in other parts. Up to the present considerably over 300,000*l.* has been spent on the structure. As far as outward appearance goes, it is a fitting monument of Her Majesty's Jubilee and a worthy addition to the great public buildings of the Metropolis.

On May 12, 1888, a charter of incorporation was granted to the Institute by Her Majesty. Three years later a form of constitution was prepared, and a governing body appointed, which may be said fairly to represent all the important interests involved, and all the great corporations of the Empire. Of course, the work of an institution of such magnitude could not be carried on without ample funds. It was estimated at the start that it would take at least half a million to place it in a state of what we may call initial efficiency. Up to date something like 420,000*l.* has been received by way of donations from the various parts of the Empire, the bulk of it in the way of private donations, only a small proportion being official contributions. Part of this sum has been appropriated as a permanent endowment fund, which stands at about 142,000*l.* The number of Fellows of the Institute is rapidly approaching 8,000, and will probably in a comparatively short time amount to 10,000; the annual subscription of these, combined with the income from the endowment fund, will yield a substantial income, but not sufficient to carry on with efficiency the many operations which form part of the functions of the Institute. There is reason to believe that the colonies will add to the contributions already given. They will, of course, maintain their own courts in the Institute, and there can be little doubt that, if convinced that the Institute will help in promoting the development of their resources and the increase of their commerce, they will see it to be to their interest to maintain it in a state of efficiency. So far the development of the original idea has been thoroughly successful. The Prince of Wales has taken an active personal interest throughout every stage of the progress of the Institute; and he has been most ably and efficiently seconded by the secretary, Sir Frederick Abel, and the assistant-secretary, Sir J. R. Somers Vine. There has so far been every reason to have confidence in the conduct of the Institute, and we are bound to believe that nothing will occur to shake that confidence.

The objects of the Institute are very clearly and succinctly set forth in the charter:—

1. The formation and exhibition of collections representing the important raw materials and manufactured products of the Empire and of other countries, so maintained as to illustrate the development of agricultural, commercial, and industrial progress in the Empire, and the comparative advances made in other countries.
2. The establishment or promotion of commercial museums, sample-rooms and intelligence offices in London and other parts of the Empire.
3. The collection and dissemination of such information relating to trades and industries, to emigration, and to the other purposes of the charter as may be of use to the subjects of the Empire.
4. The advancement of trades and handicrafts by exhibitions of special branches of industry and commerce, and of the work of artisans and of apprentices.
5. The promotion of technical and commercial education, and of the industrial arts and sciences.
6. The furtherance of systematic colonisation.
7. The promotion of conferences and lectures in connection with the general work of the Institute, and the facilitating of commercial

and friendly intercourse among the inhabitants of the different parts of the British Empire.

8. The doing anything incidental or conducive to carrying into effect all or any of the foregoing purposes.

These are manifold functions, and it would be obviously unfair to expect that at this early stage every one of them should be in running order. During all the years that the building has been in progress of erection; however, the executive have not been idle. Not only have they been organising their various departments, but they have actually been doing active work, one evidence of which is the handsome handbook which was published during the past year. But it is only now that the building is open that we can expect a serious start to be made.

GOVERNMENT BUILDINGS AT VICTORIA, B.C.

THE decision in the above competition is in favour of the design submitted by Mr. F. M. Rattenbury, of Vancouver. The five sets of plans submitted in the final competition were analysed by the experts under the several heads of "Entrances," "Staircases and Passages," "Design and Composition," "Light, Air, Lavatories," "Construction," "Detail," "Heating, Ventilation and Drainage"—the principal heads on which the award was based. As the result of this analysis, the designs were placed in the following order of merit:—

1. "For our Queen and Province" (F. M. Rattenbury, Vancouver, B.C.).
2. "Spes Labor Levis" (T. C. Sorby, Victoria, B.C.).
3. "Caractacus" (F. M. Garden, Chicago).
4. "A Red Seal" (J. M. Corner, Boston, and W. P. Skilling, Seattle).
5. "Dieu et Mon Droit" (J. Francis Brown, Toronto).

The following particulars regarding Mr. Rattenbury's design, which is in the Classic style, are given in the *Victoria Colonist*:—

The buildings are arranged in three groups—the centre or principal building comprising six departments so arranged that, whilst each of the three wings will be a perfect and complete building that can be erected independently of the others, they will when completed form a monumental and impressive pile. The grand entrance in the centre of the façade leads into a central octagon hall, terminating in a nobly proportioned dome. From this octagon hall on the ground floor the Minister of Education's department is approached on the left; the Treasury is on the right, and the Lands and Works department in front. On the first floor the same arrangement is repeated with the Provincial Secretary's department on the left, the Attorney-General's department on the right, and the legislative hall and offices in the centre. Thus from this one hall is every department immediately approached, all confusion or perplexity being entirely obviated. And while each department thus forms part of one central scheme, it has nevertheless its own independent entrance, staircases, strong rooms and lavatories, rendering it a perfectly contained and independent block.

The grand entrance is a handsome enriched portal, approached by a grand flight of steps. Through this the visitor enters the dome, which ultimately may be enriched by sculpture, mosaics and decoration. A flood of light is shed down from the cupola at the apex. On special occasions the entrance can be reserved solely for the legislative hall, the departments on either side having their own special entrance as before described. The legislative hall is situated in the centre of the block and has a corridor round it with a belt of rooms for the use of the ministers and members, committee-rooms, library, &c.

The hall itself is a spacious and beautiful room. On three sides an arcade is carried round, with galleries for the public, ladies and reporters, obtained over the corridor.

On the third floor the Lieutenant-Governor has a suite of rooms in front, facing James Bay and approached by the elevators next the principal entrance.

An unique and ingenious method of protecting the building from fire is adopted. At the approach to the three departments on each floor from the central hall a system of iron doors or bulkheads is arranged, so that in case a fire might occur it can be isolated to one wing and controlled, without there being any possibility of its spreading. The heating and ventilation are also carefully considered. This is the principal block. Two others, perfectly fireproof, one on each side, are arranged for the Land Registry office, on the right, and the Government printing office, on the left. The two detached buildings at either side stand somewhat in advance of the principal building, looking on the plan somewhat like the three sides of a square. These are connected to the main structure by a colonnade of columns, forming a covered approach from one to the other.

The winner of this competition is a young man under thirty years of age, who arrived in British Columbia from England about a year ago.

THE TUDORS AND ART.

THE sudden transition which painting experienced in England, from the state of high esteem in which the favour of Henry VIII. maintained it, to the neglect into which it sunk immediately after his death, in consequence of the proscriptions issued against the greater part of its works, is the most important circumstance in the history of English art.

That monarch, finding the period in which he reigned distinguished by the fame of the great Italian and German painters, had endeavoured to attract the most celebrated masters of their art into his kingdom. He invited to his court Raphael, Titian and Holbein, the last of whom became a resident in London. Although unable to prevail with the former two, he still persisted in his favour towards them, and procured from Raphael the picture of St. George, afterwards possessed by the King of Spain, and from Titian two pictures afterwards in the Stafford Gallery. Holbein was lodged in his palace and employed in various historical works. It appears also that, like the other sovereigns of his time, Henry was desirous of calling into action the utilities of the art, for we find in Walpole's "Anecdotes of Holbein" that "he invented patterns for goldsmiths' work for enamellers and chasers of plate, arts much countenanced by Henry VIII.," and that he made also "designs for weapons, hilts, ornaments, scabbards, sheaths, sword-belts, buttons and hooks, girdles, hatbands, and clasps for shoes, knives, forks, salt-cellar and vases, all for the king."

When ecclesiastical reform was instituted Henry appears in all his acts to endeavour carefully to separate the legitimate respect for statues and painting in churches from unauthorised regard towards them. His sentiments with regard to the admission and use of statues and pictures in churches are fully expressed in his first injunctions, as head of the Church of England, in 1538, and in a publication called "A Necessary Doctrine and Erudition for any Christen Man, set furthe by the Kynge's Majestie of England" (printed in May, 1543).

The following passages there occur in the exposition of the Second Commandment, wherein a full direction is given for setting up images in churches, "to be as booke for unlearned people to put them in remembrance of those sayntes, of whom they may learne examples of fayth, humilitie, charitie, patience, temperaunce, and of all other theyr virtues and gyftes of God. As for an example, the image of our Saviour hangeth on the crosse in the roode, or is paynted on clothes, walles, or wyndowes, as an open booke, to the intent that besydes the examples of virtues, which we may learn of Chryste, we may be also many wayes provoked to remember his paynefull and cruell passion, and also to consyder ourselves, when we beholde the same image, and to condemne, and abhorre our synne, which was the cause of his so cruell death." His letter to Cranmer, in 1542, is to the same effect.

In conformity with those sentiments, Henry continued to the last to protect the works of art in the churches from the indiscriminate zeal of the reformers; but the rein having once been given to iconoclastic fury, it could not lightly be checked, and in the beginning of the reign of Edward VI. a letter of the Protector and Lords of Council addressed to the same Archbishop of Canterbury runs thus:—"Considering therefore that almost in no place of this realm is any sure quietness, but where all images be clean taken away and pulled down already, &c., we have thought good to signifie unto you his Highness's pleasure, with the advice and consent of us the Lord Protector and the rest of the Councell, that immediately on the sight hereof you shall not only give order that all the images remaining in any church or chapel within your diocese be removed and taken away, but also by your letters signifie unto the rest of the bishops within your province, this, his Highness's pleasure for the like order, to be given to them," &c.

Nor was even this strict charge thought sufficient. It was followed by a statute in 1549, in which is the following article:—"And be it further enacted, by the authority aforesaid, that if any person or persons, of what estate, degree or condition soever he, she or they be, body politick or corporate, that now have or hereafter shall have in his, her or their custody, any books or writings of the sorts aforesaid, or any images of stone, timber, alabaster or earth, graven, carved or painted, which heretofore have been taken out of any church or chapel, or yet stand in any church or chapel, and do not, before the last day of June next ensuing, deface and destroy, or cause to be defaced and destroyed, the same images and every of them, and deliver or cause to be delivered, all and every the same books, &c., to the mayor, &c., &c., shall, after the said last day of June (being thereof lawfully convict) forfeit and lose to the King our Sovereign Lord, for the first offence xxs., and for the second offence shall forfeit and lose (being thereof lawfully convict) ivl., and for the third offence shall suffer imprisonment at the King's will."

To these acts of prohibition succeeded in 1559 an "Injunction given by the Queene's Majestie, as well to the clergie as to the laitie of this realme, in the fyrst yeare of our Sovereigne

Lady Queene Elizabeth," two articles of which run thus:—"Also that they shall take away, utterly extyncte and destroy all shrynes, coverynge of shrynes, all tables, candlestykes, tryndalles and rolles of waxe, pictures, payntinges and all other monuments of fayned miracles and superstycion, so that there remaine no memorie of the same, in walles, glasses, wyndowes or elsewhere within their churches and houses," &c. "Item, that no persons kepe in their houses any abused images, table, pictures, payntinges and other monuments of fayned miracles, pilgrimages, ydolatrie or superstycion."

In the convocation held by the archbishops in the thirteenth of the same reign, among other canons, this for taking down and defacing pictures and images was one. The canon (eighteenth) runs:—"That the churchwardens shall see the church kept clean; the Holy Bible to be in the churches; and the holy homilies, lately set forth against rebellion; and all rood-lofts, wooden crosses, pictures of false and feigned miracles and all other relicks of superstition destroyed and demolished; the walls of the churches to be new-whited, and sentences of Holy Scripture to be written upon them in great letters."

The exercise of this power in the hands of churchwardens, during a time of religious controversies may be easily imagined. The charge of new-whiting the churches was a sweeping commission that left no compromise. The homily against idolatry had also particular reference to the pictures on the walls of churches.

Nor was the practice of destruction confined to the above-mentioned depositaries of religious judgment. "In the Queen's time," says the Attorney-General, in a State trial, 8 Car. I., "many went abroad, of their own heads, to break down crosses, images and pictures of all sorts." This violence proceeded to such excess that a proclamation became at length necessary, stating that:—"Whereas many violent persons have of late, of their own authority, gone about to deface the walls and glass windows of churches; and in their violence have pulled down tombs and monuments of noblemen and gentlemen deceased, to their dishonour and to the breach of our peace; therefore a strict commandment is given, that all men forbear to break the pictures set upon tombs or graves, and not to break the pictures or portraictures of the noblemen or others in churches, church-walls, windows, &c., nor any images whatsoever, without the advice of the ordinary, or the advice of the Queen's Majesty, or her Council," &c. Given 44 Eliz.

The Queen's proclamation, although it might suppress particular violences and regulate the actions of men of rational opinions, did not abate the popular prejudices against the unfortunate arts of design. "I undertake," says a witness at the same trial, "there are some spirits now, that, if they had been alive in Solomon's time, would have gone nigh to have done violence to the cherubims. God knows what would have become of them."—(State Trials. Proceedings against Henry Sherfield, Esq., for breaking a painted church window. 8 Car. I., 1632.) Under such persecution the arts were not able to maintain their ground. Their professors sunk into poverty. One amateur named Hillier expressed himself about their condition in this way. "If a man be so induced by nature, and live in time of trouble, and under a government wherein arts be not esteemed, and himself but of small means, woe be unto him, as unto an untimely birth, for of mine own knowledge it hath made men poorer, as amongst many others, the most rare English drawer of story works." It is probable that few adventurers were found to supply their places, and the field was therefore left open to the occasional speculations of foreign artists.

PAISLEY TOWN HALL.

AT the meeting of the Paisley Town Council it was reported by the Town Hall Committee that Mr. Lynn, architect, Belfast, to whom the designs for the painting and decorating of the Town Hall had been submitted, had given the first three places to the designs submitted by Messrs. A. & J. Scott, Glasgow, and Messrs. Cowan & Stewart and David Murray & Son, Paisley. In his letter Mr. Lynn stated that the designs of Messrs. Scott and of Messrs. Cowan & Stewart were of equal merit. The offers for the work were subsequently submitted to Mr. Farquhar Matheson, measurer, who reported on them as follows:—A. & J. Scott, painting 658l. 9s. 11d., and decoration 100l.—total, 758l. 9s. 11d.; Cowan & Stewart, painting 732l. 6s. 9d., and decoration 130l.—total, 862l. 6s. 9d.; David Murray & Son, painting 862l. 13s. 9d., and decoration, 150l.—total, 1,012l. 13s. 9d. Other designs:—Painting offers, David Bett, 466l. 7s. 2d.; James Paul & Sons, 536l. 0s. 1d.; John Orr & Sons, 721l. 10s. 6d.; C. Carlton & Sons, 758l. 6s. 9d.; McCulloch & Co., 894l. 7s. 6d. The above probable costs include for ceilings and walls only of large hall, loggia, principal entrance, corridors and principal stairs, and were calculated on the assumption that four coats of paint would be sufficient for the whole work. Messrs. Scott's design was adopted.

THE CONTINUITY OF CONVENTIONAL PATTERNS.*

MODERN criticism has its own prejudices and its own narrowness. It is very loud in its announcement of the evolution theory, but it is very illogical in supposing that there has been no evolution in the field of ornament. I shall try to show in this paper that it is in blunt contradiction with the researches of its own anthropologists when it asserts that geometric ornament is the initial starting-point of primitive man. According to the *Critic*, "Given the tools and an instinct for decoration, geometrical ornament will spontaneously follow," but when we examine history we find that the earliest ornaments of primitive man were very life-like pictures of the mammoth and other animals, the drawings on bone and horn of the Palæolithic epoch. For the moment let us remember where we obtained our own theory of conventional art, how long we have had it and how very apt we are to transplant the habits of thought created by it to the art of other days, without authority and without reason.

It is the limitation in number, the simplicity and the widespread modern use of these conventional traditional patterns that has caused the belief that some of them are spontaneously generated whenever and wherever an ornament is wanted. That they are found both in ancient and modern art at remote distances in various quarters of the world, and at points which appear to us to have been inaccessible to one another, is undoubtedly true. That they are universal is not true; that they are common or elementary or indigenous forms in primitive art is not true. That they have ever been spontaneously generated in Europe is positively untrue. I shall show what amount of historic continuity can be proven for them, and when this has been done I think that the advocates of the spontaneous generation theory will admit that its case is very much in suspense, not by any means a matter of course, and certainly not a case which will justify its advocate in patronising an opponent.

I do not think it has been suggested that the Ionic capital, the "honeysuckle" or the egg-and-dart moulding have ever been spontaneously generated, but it is the prevailing view that the meander, the various forms of spiral ornament, the guilloche and the rosette are "reinvented every time an untaught person tries to invent ornament," and that "they are found in the ornament of every savage tribe that has attained a little skill." But all seven motives named, and some few other motives, belong to one ornamental system, and have never been used in Europe, apart from historic connections with their original system, since the Greeks, and have never been used in Europe since prehistoric ages, without distinct dependence on the Greeks. As found with the Greeks they can all be traced back to Egyptian sources, except the guilloche, which is only a later variant of the spiral scroll.

I will not stop now to debate the origin of any of these forms, and I will waive the egg-and-dart moulding, as regards even its mention in the Egyptian category, if any one should desire me to do so, as its motive is only found in Egypt in the form of a flat lotus border inverted. But still let us stop a moment to consider this point of historic continuity for the ornaments named, in block. The Egyptian rosette can be dated to the Fourth Dynasty, 4000 B.C. Since that time its history has been continuous. Since its first transmission to Europe it has never been reinvented in Europe, for there was never an occasion or a chance to reinvent it there. The spiral scroll is dated to the Fifth Dynasty. That, too, has had a continuous history since that time down to the nineteenth century, as far as Europe is concerned. The meander is dated at present to the Thirteenth Dynasty, about 2500 B.C., and the same point holds again for its European history after that date. The Egyptian Ionic capital is dated to the Eighteenth Dynasty, 1600 B.C. The Egyptian anthemion ("honeysuckle" original) is dated to the Twelfth Dynasty (about 3000 B.C.). In the various cases mentioned the dates are for the earliest known cases among the very rare instances of positively dated ornaments for very early times, and a considerably higher antiquity than the given date must be assumed in all cases. The lotus border originals of the egg-and-dart moulding are certainly much older than the Eighteenth Dynasty to which we can positively date them.

Some of these ornaments travelled all over Europe in the prehistoric period. None of them, however, appeared in Europe before the age of bronze, and they moved with the arts of metal partly by land, partly by Phœnician commerce, from the south and south-east to the north and north-west. From the days of the Greeks downward the history of all these forms and patterns is continuous in Europe. In the Middle Age, when Classic art was nominally or apparently abandoned, the surface patterns at least are historically continuous. The anthemion can be verified for all periods of the Middle Age. The Ionic capital survived till the twelfth century at

least. The egg-and-dart moulding can be verified for the twelfth century at Arles. The rosette was never given up. The spiral scrolls are historically continuous and the Egyptian lotus trefoil (*fleur de lys*) is a conspicuous instance of continuity.

With the Renaissance period the Greco-Roman motives were all revived, and many of them had survived without reference to this revival. It is not long between the last days of Classic art in Southern France and the first days of the Italian revival in Pisa. From the time of the Renaissance to the nineteenth century all these motives have been strictly traditional. They have been carried along by the great waves of civilisation which have moved from the Renaissance, from the Greek revival, and from the recent studies of historic art. Their continuity is a phase of the one essential fact of the history of civilisation, that man never reinvents anything that he finds ready-made to hand. They met all the natural demands for ornamental patterns. They were passed on from one decorator and artisan to another, as the matter of course things to do.

Now I urge that the history of ornament in Europe establishes a preliminary presumption that these ornaments when found elsewhere may not have been created independently or spontaneously, and outside the American continent we have not the slightest difficulty in proving a positive case.

I will now take up successively the patterns for which the claim has been especially made that they "are reinvented every time an untaught person tries to invent ornament." It may be well to mention the ethnographic collections on which I base the following statements. They are the New York Natural History Museum, the National Museum at Washington, the South Kensington Museum, the British Museum, the Pitt-Rivers Museum at Oxford, the Trocadéro in Paris, the Kircher Museum at Rome, the Ethnographic Museum of Amsterdam, the Ethnographic Museum of Berlin, and the Ethnographic Museum of Leyden. The two last-named are the finest collections in the world, and I have made a careful study of their evidence, having examined thousands on thousands of objects to reach my conclusions.

Notwithstanding the enormous number of objects from the Pacific Islands in Berlin and in London, the Leyden collections must be placed first. They are much more comprehensive and systematic as regards a balanced choice of objects for all local centres, for the Pacific Islands in general, and above all they are connected with a representative exhibit for the Malay Archipelago which is simply unique.

When these various ethnographic collections have been examined it appears that the conclusions obtained for Europe regarding the meander are substantiated. So far from being a universally employed or spontaneously generated pattern, it is distinctly traditional outside of Europe, as far as we can trace its history. It is unknown to barbaric Africa; it was not used in ancient Mesopotamia. It is foreign to Mohammedan and Arab art. Its sporadic appearance in Asia, India, Thibet, China and Japan is due to Buddhist influences. The Buddhist art is the earliest that we know in India (third century B.C.), and at its first appearance is saturated with Greek influences through the Greek states of Bactria founded by the successors of Alexander the Great and through the commerce then actively carried on with the West. These same Buddhist influences by way of farther India would explain its occasional appearance in the decoration of the Malay Archipelago, where it is by no means common. The meander is so rare in Polynesia that the Leyden collection contains only two examples, and I have not observed a single other Polynesian instance in the magnificent collections of London and Berlin.

In order of prominence among the formal linear patterns which are traditional in nineteenth-century use, we may next mention the spiral scroll. Most of our spiral scrolls have a Renaissance derivation—that is, they are survivals of fifteenth and sixteenth-century Italian copies of Greco-Roman originals, which in their turn are derived from the earlier Greek, and these again are decorative evolutions from Egyptian patterns. When our spiral scrolls are not Renaissance, they are copies dating from the Greek revival of the late eighteenth and early nineteenth century, or they are copies taken by recent decorators from the recent publications of historic decorative art. The theory of spontaneous generation, the supposed natural aptitude of anyone who has "tools and an instinct for decoration" for making spiral scrolls without reference to tradition, shipwrecks utterly when brought face to face with historic facts as far as Europe is concerned. Tradition is not only the rule, but it is a rule without exceptions.

Theorists and reviewers (who are generally more than twenty years old) can sit down at a desk and design a spiral scroll on the writing-pad which will carry their article to the press. They will then announce on the same writing-pad that any child can do the same thing, and that primitive man can do, and does do, anything that a modern civilised child can do. But somehow it happens that reviewers and children who have grown up, or are growing up, surrounded by the originals of the

* From a paper entitled "Are Conventional Patterns Spontaneously Generated?" by Mr. W. Henry Goodyear, in the *Architectural Record* (New York).

forms which they fancy themselves to be inventing, are not the people who are called upon to design decorations for the market. Decoration is a trade which presupposes, like all other trades, a special education and compels it. This education is either traditional, that of the artisan—say a stove-maker—who recasts an old pattern with or without slight modification, or it is special, the education of an architectural school or a school of decorative art, where the pupil is surrounded by historical examples whose influence comes to the same thing.

The question is not whether a person who braces himself up to answer Mr. Goodyear's theories could not invent something new in the way of a spiral, but the question is, whether before the time of theoretic instruction in decoration, which never existed before 1850, anybody who was an artisan decorator ever did brace himself up to do such a thing. When the question is put in this way the argument is all on my side to anyone who knows anything about the history of ornament.

As a matter of fact under normal conditions, wherever and whenever a new departure is made in ornament, that new departure will be from a natural form or a natural phenomenon. Where the pattern is abstract, schematic, or apparently purely linear, that pattern will be a traditional survival of a form which was once also a form of nature, and the modifications made in it will have been gradual and evolutionary.

I am speaking now of the spiral scroll especially, and having asserted that all our motives of this character are fundamentally Classic, and Egyptian before they were Classic, I wish to speak of the spiral scrolls of other ornamental systems, mainly to say that, like the snakes in Ireland, there are none—none, that is, that are not derived from the system under discussion.

We have seen already that the earliest Hindoo art known to us is Buddhist under Greek influences, and we must turn now to the "Moorish," or more correctly, Arab Mohammedan system, to notice that this also is of ultimately Classic derivation. Aside from Persian influences on Arab art, which again go back to the same original elements, Arab ornament was derived from Syria, Egypt and North Africa (all of which were Byzantine [Roman-Greek] provinces) in the seventh century A.D., and at the time of the Mohammedan conquest of these countries from the Byzantine Empire. The dependence of the Arabs on Byzantine culture has been well explained by Mr. Freeman in his lectures on the Saracens, and is otherwise a commonplace of the average historian. All the Arab and Mohammedan spirals (generally with lotus trefoils) are modifications and evolutions from the Byzantine Greek. If you will turn now to a map of the area of the Mohammedan religion, which means Mohammedan art and culture also, you will find it reaching in Africa from the shores of the Mediterranean to the river Gambia, to the Niger, to Lake Tanganyika, and to Zanzibar.

In Asia we find the Mohammedan colour spreading from Arabia, Asia Minor and Persia through Turkestan into Siberia as far as the river Ural, as far as Tobolsk, as far as the Irtysh and the Obi. We find the Mohammedan colour spread over India, in the peninsula of Malacca and the Malay Archipelago, Sumatra, Java, Borneo and the Celebes. Now let the reviewers who assert the spiral scroll to be one of the natural ornaments of barbaric man consider the point that it does not occur in barbaric Africa at all, excepting in cases of palpable Moorish or Arab art. I have seen it, for instance, on some very rude brass vases of Moorish design from the Niger, in Berlin. Otherwise it does not occur in the Niger or the Congo country or in other parts of barbaric Africa. The Somali and Abyssinian ornament is of course Arab.

If we turn to the Malay Archipelago, as compared with Polynesia, the case for the historic traditional continuity of the spiral scroll becomes a certainty. It is here that the ethnographical collections of Leyden come in play, the only systematic and complete collections for the Malay Archipelago in the whole world. Let us remember now that the ornamental system of India was, in the first instance, as known to us, Buddhist, under Greek foreign influences as explained; second, Arab Mohammedan. The spiral scroll ornament of modern India is a mixture and survival of the two. (The more formal Classic style of old Buddhist ornament has disappeared in India.) This is the ornamental system of the Malay Archipelago. One of the most astounding monuments of Buddhist architecture is the ruin of the temple of Boro Boeder on the island of Java. The present ornamental system of Malaysia is mainly the Mohammedan Arab. The Malay alphabet, the Malay ornament, the Malay religion and the Malay culture are all derived from India. Now let the theorist, as to the innate ornamental habits of primitive man, consider that the spiral scroll is absolutely foreign to the ornamental systems of Polynesia, of which there are several. The limit of the spiral scroll eastward in the collections of Leyden is the Admiralty Islands, bordering on New Guinea, which is part of Malaysia.

In the Admiralty Islands it is sporadic. In Leyden there are only two instances. In the Berlin collections the sporadic cases of the spiral are found in other islands also adjacent to New Guinea, south-east of the Admiralty Islands. Considering that the whole of Polynesia is conceded to have experienced

influences from the Malay Archipelago, we should not be startled at the sporadic appearance of spiral scroll ornaments farther east than the Admiralty Islands, but since I have reviewed the Polynesian collections of New York, Washington, London, Amsterdam, Berlin, Oxford, Paris, Rome and Leyden, and the publication of Partington for Polynesian ornament, I am willing to rest my case with the simple statement that the spiral scroll is foreign as such to all the ornamental systems of Polynesia, and that the system of the Malay Archipelago is the Mohammedan Arab, which is derived from Byzantine Greek.

There only remains the case of New Guinea and New Zealand. Not only does New Guinea border directly on the Malay Islands, but it is geographically part of Malaysia. The princes of the island of Tidore have actually been the potentates of the northern coast of New Guinea. The New Guinea ornamental system shows degraded and barbaric forms of the Mohammedan spiral scrolls of Malaysia. From these once more are derived the spiral scroll ornaments of New Zealand.

The Maoris are supposed emigrants from Tahiti, but the ornamental system of New Zealand has no relations with this supposed earlier home of the Maoris. It will show the possibilities and surprises of intercourse in this part of the world to say that a Japanese bell was found in the possession of the Maoris which had been in New Zealand before the time of the first European settlers. My informant is Dr. Codrington, the great authority on Polynesian and Melanesian languages.

Now let us turn to the evidence of the Berlin ethnographical collections, which are simply marvellous in the mass and comprehensiveness of their material for the areas below named. Once more, and this time through Buddhist transmission, we can trace the spiral scroll from the Amoor Valley, where the ornamental system is as familiar to us as that of the Malay Archipelago, through the Yakoots of Siberia to the Aleutian Islands and Alaska.

I have re-examined last summer in the museums of Berlin and Leyden and in the Pitt-Rivers Collection of Oxford the question of the spontaneous generation of the rosette, with the following conclusions:—The area of this ornament is far more limited than the area of those just considered. In modern use it is historic and traditional. In ancient European use it was limited to Mediterranean countries and their influences, originating in Egypt and transmitted to Mesopotamia, Phoenicia, Greece and Italy. Its use was more and more limited in the later Greek and Roman art, and consequently in the Byzantine, and I am not acquainted with it in Arab use to any marked extent. It was extremely common in ancient Buddhist art, but appears to be rather more limited in modern Hindoo survivals. It is unknown to barbaric Africa and unknown to Polynesia, unknown to New Zealand and New Guinea, mainly unknown to Malaysia. Its rare appearance in ancient American art must be classed with problems suggested by the normal lotus in the same art, in stone-carvings and in gold, and I think can only be explained by direct transmission from the ancient Mediterranean world. There is no pattern of which it can be asserted with so little reason or show of reason, that it is common and natural to all barbaric and primitive peoples; for it does not appear to be common or native with any. The rosette is an obvious combination for modern Kindergarten scholars who are taught to make elementary geometric patterns and to use petals of flowers and floral forms as suggestions for geometric combination—but I do not care to have my case damaged by an appeal to the Kindergartens. I prefer to appeal to history and to the ethnographical collections of the world.

I would recommend above all to inquiring minds on this general subject of the continuity of the historic patterns, a study of the ornamental systems of the Pacific, as showing what barbaric man really does do and how many different things he does, when he is left to his own ornamental instincts without the extraneous influence of a superior civilisation. A natural appearance of phenomenon of some kind or other appears to be the invariable starting-point. As the pattern itself then becomes a tradition and the point of departure for a new copy, this is gradually simplified until all semblance of the original is lost. The human figure or some portion of it was undoubtedly, in many cases, the initial form. In the Pitt-Rivers Museum, at Oxford, there is a series of paddles showing the gradual transformation of a human figure carved upon them, into a crescent supported by a bar. There is also the case of a fish head used to decorate the junction of the paddle blade with its handle, which finally degenerates into the shape of a capital letter W. There are multitudes of these designs which cannot be explained for want of the connecting links or of the originating form, but I believe it is the conviction of experts in this department that a purely arbitrary or ideally schematic form was rarely or never the first element of the pattern. The introduction of different colours in weaving or basket-work to produce diaper patterns would perhaps be the only exception to this rule. That the figures of men, fish, animals and birds, which originated patterns, were fetiches and totems—that is to say, religious emblems or rather talismans—may be always taken for granted.

BUILDING IN AUSTRALIA.

IT would appear from an article in the trustworthy Year Book of Australia that at present building is not a profitable business in the colony. The following explanation of the causes is offered:—

What has been accomplished in Australia during the past year in the way of architectural achievements and developments is illustrated under its chief aspect—that of the practical—by the appended list of principal buildings. Yet withal, that part of architecture, *i.e.* its realisation in actual bricks and mortar, &c., has suffered lately a great falling-off throughout the colonies. Few buildings of any importance now remain to be finished, and outside of Government contracts, which are also considerably lessening, and which will continue to do so with the reductions in staffs that are so general, there will, it is feared by many, be really nothing new started in the way of art building for some time to come. Of course, lots of proposed designs have been “on the boards,” but these are still *in statu quo* as drawings merely, and are now “hung up,” awaiting better times before they can be taken in hand and carried out. This lack of work will then be most conspicuous in the coming year; therefore it may perhaps be as well to refer to the cause of such a state of things, and suggest possible improvement. The main reasons for this slackness of enterprise, architecturally, are unfortunately the same as those through which every other department of life suffers, *viz.* the depression after the enormous expenditure in the land boom, and over (speculative) building times of 1888, *et seq.*; the conflicts of labour *versus* capital; the subsequent demoralisation and failure of financial and other institutions and prominent individuals; and the present loss of confidence of English and other investors. All this has involved want of work and employment, and augmented an already grievous deficiency in our national revenues; so that altogether the money market and all its appertinings are in a very perilous condition through the consequent paucity of funds. Thus have been necessitated schemes of retrenchment and taxation. Truly a big burden for the colonies to carry are these accumulated bad effects of ill-advised actions, and they press more heavily on the combined arts and crafts of architecture than on any and everything else. Yet, if we can profit by the lessons they teach us, may they not, after all, be but blessings in disguise? As regards the situation the excitement of the land fever time has placed us in, it is but to be expected, for the nineteenth-century tendency is proneness to exaggeration, and it is seemingly a specially sad sign of this *fin de siècle* decade. Over-hilarious hopefulness in a time of high prices is now matched by futile feelings of depression and dejection when the inevitable period of depreciation and deterioration in values sets in, and the one is as erroneous as the other was fallacious. Half a decade back fully four-fifths of the people considered that land in the various outlying suburbs was bound to run up to metropolitan prices, and that it must be got hold of at any figure. Now the vogue is to treat land as absolutely worthless, which is a decidedly absurd extreme. For while, of course, there may have been want of balance in believing we were in 1888 entering on a monetary millennium, still it is showing similar mental obliquity to discredit and decry our present position, and maintain that we are going down into a bottomless pit of bankruptcy. Let us rather adopt the happier mean, and be trustful that things will quietly brighten, our narrowed lane have an ampler turning, and our sense of tightness and straits give way and open out into paths of pleasantness and peace. Such a way of looking at affairs is really our heritage in these latter days, and we ought to live up to our privileges. Really we moderns are responsible for sanguine views in such matters, for the ancients, the Mediævalists, and the men of the Renaissance period even, had no such store of faith to guide them. In those olden times the factor of variableness in prices was so conclusively patent that fluctuations of land values became recognised as a thing of course—that is, if they ever bothered to think about them at all. Now the *raison d'être* of a “boom,” *ipso facto*, predicates such and such a transaction being considered a good investment, and argues, therefore, that a rise in prices is only a question of time. Well, and where can we look with such certainty for such a result as in these colonies if the natural resources are only given proper scope and outlet? What other countries for their years would be so self-reliant under such (to them) unlooked-for trouble and trials as the Australian colonies have been? Think of how New South Wales, Queensland, South Australia and Victoria have lost lately in the various ways before referred to, as well as in other unforeseen directions—Brisbane losing fully a million in one year through fire and flood, and other portions of our dominion also suffering severely; and yet they all keep up a good front before the world. Surely that speaks volumes for the inherent power of endurance that the colonies possess, and which has undoubtedly kept them from feeling and showing the strain and struggle in a much greater degree—as they well might—than they have done. Why, at this juncture, after all said and done, the country—the real backbone of our nation—

teems with plenty; the fields are heavy with the harvest, and the vineyards laden with fruit; wheat, wool and butter, corn and wine and oil, in fact, all kinds of produce, point to profitable returns, and the prospects are most promising in our staple and stable industries. Then, we have not the drawbacks of our mother country and the continental nations—the chances of war, pestilence or poverty, with all their glaring and ghastly concomitant evils, to enfeather our Austral homes. That we have attained our admittedly high place and position in the short space of a century is true; but it has been consistent progress in the most progressive of centuries, and it is not in the nature of things that we can possibly retrograde. So it needs but the proper, hopeful, insistent spirit being instilled into our minds again to inspire us with the firm belief that we are approaching a time when what we have already attained will be as nothing. In the dawn of that period of prosperity the Australian empire will then look upon this ugly epoch of its history as only noticeable in the grand era that succeeded as being one of the natural links in the chained sequence of events that bound them the more coherently together. Another of the causes that have influenced, and still influence, stagnation in architectural matters is the want of appreciation—we could almost say distrust—of architects generally, shown by the major proportion of the public who should make use of their services.

AMERICAN COMPETITIONS.

IN a communication to the *Engineering Magazine* Mr. Barr Ferree writes:—There seems to be no diminution in those relics of uncivilised times—architectural competitions. Every year some important mercantile building is decided by this cumbrous, expensive and unnecessary method, which is as sensible as if a sick man were to send for a half-dozen doctors and promise to engage the one that would effect the speediest cure. How long this state of things is to continue it is idle to predict, but, being an unavoidable evil, it is clearly right to make it as little an evil as possible and to eliminate from it every possible suspicion of unfairness. Architectural competitions, unfortunately, are looked upon in so many quarters as perfectly natural and proper things that the methods of conducting them are very well known, very well understood, and, so far as the architect is concerned, very well systematised. A well-drawn competition programme is a thoughtful document, embodying a multitude of details and requiring a wide acquaintance not only with the practice of architecture, but with the entire history of architectural methods. It is a document that cannot be drawn by every architectural practitioner, and, as might be expected in this era of specialism, we are gradually producing a small school of competition-programme makers, who, if this system is to be continued, must before long exercise an influence on current architecture quite out of proportion to their merits. It is hard for the most conscientious programme-maker not to infuse his personality into it, to indicate his own personal inclinations as to style and treatment, to tell the architect, so far as he dares, how to treat the problem, it is only his business to indicate in the most summary fashion. Much of this is unavoidable, but the influence of this hidden and powerful force in current architecture is not to be despised. In the limited competitions which are now the fashion, the most careful scrutiny is exercised as to the architects who shall be invited to compete for it. Their merits and demerits, their advantages and failings, their good work and bad, are all passed in review, and the very best selected. Yet who examines the programme-maker, who questions his authority or his competency, studies his prejudices or makes allowances for his idiosyncrasies? He needs looking after as sharply as the architect. He may be, if he chooses, a most dangerous man.

The professional programme-maker is a natural product of the competition system. Under our present architectural fashions he is more likely to be a teacher of architecture in an architectural school than a practising architect. For some reasons such a person possesses many advantages for the work. He is not distracted by the labours of actual practice; he has time to give to study, for which the busy man of affairs can devote no moments. Years of exercise in criticisms of youthful drawings have trained his mind in critical methods, even though the material on which it has thriven has not been of the healthiest and most invigorating kind. All of these are distinct advantages, and coupled with the fact that he has probably had much experience in these things—else how could he be a professional programme-maker?—make him a very proper person for this sort of work. But he has his disadvantages, as have most people and much architecture. The teaching of architecture, as the teaching of any subject, tends to keep the teacher's mind in a single rut. He views things from the academic standpoint, and in this country knows no architecture save that taught in the Rue Bonaparte. In other words, the architectural teachers of this country have so positively made up their minds that the system of the *Ecole des Beaux-Arts* is

the only one to be employed in instructing young architects that nothing else is considered necessary for their training. Instructors in construction must, perforce, keep pace with the gigantic constructive strides American architecture is now making; but the teacher of the art of architecture, as the more ornamental side is often wrongly called, and who is most likely to be the professional programme-maker, knows no architecture save that of Paris and its world-famous school. A person so trained is not in the least fitted to draw up a programme for a competition for a business building, for example. What have orders and columns and friezes to do with a business building? One has only to look at those examples in which they occur to find an answer. The professorial professional programme-producer—to give him a stated title—is out of touch with much modern work. Living in a single style, he sees solutions in it only, and his programme is drawn up accordingly. An architect, finding hints of the Classic strongly stated in the programme, necessarily imagines that he must follow them. And thus the professorial professional programme-producer helps along his own school by forcing the use of his style, whether it be really suited to the problem in hand or not. The retarding influence he can exert on the progress of American architecture may not always be recognised, but it is nevertheless a fact. The creators of competitions should examine his merits, as well as those of the architects they invite, before putting his work out upon a long-suffering, though perhaps indifferent, world.

If the antecedents of the professional programme-maker need to be looked into in every well-ordered competition, the antecedents of the jury should be not less carefully studied. The deciding of competitions, as well as the drawing up of their programmes, is rapidly falling into the hands of the professors of architecture. Architects in active practice are either taking part in the competition, or do not wish to give the time and thought necessary to the judging of a series of architectural designs. Besides, the mental agony incurred in looking at atrocious designs is likely to interfere with the work of an artistic architect for some weeks to come. And so, the architects not being available, the jury plums fall to the professors. And people more unsuited to such work it would be hard to find. Professors, like other folk, have their prejudices and failings, their inclinations and preferences. They like one style, abominate another and look with indifference upon a third. The style they like is doubtless the only one they know, since even a professor of architecture cannot know everything; certainly it is the one they are apt to judge by, because it is the best. Here comes a new element for the architect. He not only has a programme drawn up by a biased hand, but he knows that, if he wishes to gain a certain competition, he must follow the inclinations and prejudices of his jury. An architectural jury, unlike one in a court of law, does not judge by facts but by prejudices. If an architect knows its members to be classicists, he knows as well as he knows anything that, if he sends in anything but a classical design, he will have his trouble for his pains. He might, if he has a strongly-marked individuality, work out a thoroughly practical design in some other style, but he wants that building, and bends his mind to an uncongenial task, and then wonders why he did not get the prize. Thus the architectural professor retains his grip upon current architecture, though its methods and necessities may be quite foreign to his style of thought and art. Both the professional jurymen and the professorial professional programme-producer are legitimate products of the competition system; yet both are fundamentally opposed to the true progress of architecture. To a very large extent they are a neglected element in current architecture, but they are getting in their innings with the wisdom of the proverbial early bird. A true appreciation of their real nature must help to destroy much of the present false confidence in the unquestioned merits of competitions, as it will likewise help to make clear their inherent unfairness. Meanwhile the programme-producer and the jurymen should be carefully selected in every case. They cannot, if architecture is to live, be permitted to become a class.

Abominable as architectural competitions necessarily are, some good words may be spoken for the Bill passed by the late Congress permitting limited competitions for public buildings. If there has been one phase of American architecture more atrocious than another, it surely has been its official side. Americans do not naturally do foolish things, but they clearly exceeded all previous records when they evolved an architectural system whereby a single office, and nominally a single architect, should be responsible for the huge number of Government buildings yearly erected in this country—a number now estimated at about 300. And in order to make things as bad as possible—as if this in itself were not sufficiently preposterous—all of this was to be done by an architect holding office for not more than four years, and often for less, and, as likely as not, as incompetent to undertake work on this gigantic scale as he was to earn the meagre salary of the post by private practice. It is no wonder, that the architects of this country

have been protesting for years against the horrors of this situation, and it is no credit to the intelligence of our national legislators that years have been necessary to bring about a reform. The new law contains many imperfections, and is not at all what it should be, but it is a move in the right direction. The secretary of the treasury is now authorised to institute a competition limited to five architects for any public building at his discretion. This is the substance of the law. It is not mandatory, it need not be applied in every instance, and only the successful architect is entitled to compensation for his plans, which are to be executed under the supervision of the supervising architect of the treasury. Insufficient as the law is, it must work many important and long-needed reforms. Whether under it our official architecture will take a fresh lease of life and thrive and flourish in a way long unknown to it may be doubted. But then this art could not by any possibility be worse than it is, and there is every reason to believe that the present entering wedge will prepare the way for further efforts and more successful results in the near future. For several years the chief business of the meetings of the American Institute of Architects has been the discussion of such a law as this, and the taking of measures to secure its enactment. The present legislation is largely due to the activity of that body, but its occupation is not yet gone. There is much to be done yet for the furthering of American official architecture, and of American architecture in general, before the Institute can regard its chief mission as finished.

OXFORD, ROUEN AND NUREMBERG.

A LECTURE was delivered recently to the members of the Department of Architecture, Brooklyn Institute, by Mr. Albert E. Parfitt, architect, upon "The Three Types of Architecture as expressed by Oxford, Rouen and Nuremberg." The illustrations were thrown on a great screen from original and very fine lantern-slides.

He began by remarking that someone has said that nations write their histories in three ways—in the book of their deeds, in the book of their words and in the book of their arts, and that to read one of these books alone is to remain for ever ignorant of a great part of that nation's history, and of these three ways the most trustworthy is the last, the book of their arts. No writings express the religious fervour of the Middle Ages so well as the noble towering cathedral buildings and their sublime imaginations chiselled in stone. The huge monastic buildings scattered over Europe tell the story to-day with peculiar force of the growth of these institutions and of their life and habits.

The idea in selecting three cities, Oxford, Rouen and Nuremberg, to express three types of architecture is an attempt to describe certain characteristics of local art rather than national, for it cannot be said that Rouen expresses the art of France, but rather some of the best phases of the art of France of the Middle Ages. Neither can Nuremberg be taken to express the art of Germany, but rather of one of her imperial cities, but Fate has so preserved this city that there is probably no town in Germany whose external appearance is still so Mediæval, and gives an idea of its old-time wealth and influence.

The city of Oxford well illustrates the gradual evolution of English architecture. One can walk through her churches and college buildings and see excellent and well-preserved examples of Norman, Early English, Decorated, Perpendicular, Elizabethan, Jacobean, English Renaissance and the revived Classic and modern revived Gothic style of the present day. There is no special "lay-out" to the city, the irregularity of which in some measure is the cause of its most picturesque effects. The groves and avenues of trees, the quiet college gardens, the absence of large factories and tall chimneys, all combine to make Oxford the fairest city in England. Quadrangles are a special feature in Oxford; nearly all the colleges are planned on this system, and certainly for beauty they are unsurpassed, affording, as Hawthorne says, "a sweet, quiet, sacred and stately seclusion." Magdalen College, from its singular beauty, might be rightly called the queen of Oxford's colleges—beautifully situated by the river Cherwell, its massive tower rising up as if to guard the noble bridge, which forms a continuation of the High Street. We do not know who really did design this fine structure—indeed, we know but little of the designers of the Middle Ages; but during its erection Wolsey, the great cardinal of the time of Henry VIII., was bursar of the college, so that his name has always been associated with it.

The effect of the interior of Christ Church Cathedral is surprisingly beautiful; over the stern Norman columns in the choir a gorgeous pendentive roof of stone hangs, reminding us of the Henry VII. Chapel at Westminster. Contemporary work in Europe at this period (which was about the date of the discovery of America) shows Classic influences and Gothic art abandoned, but here in England comes the climax, and it seems that the resources of Gothic art could go no further.

The Reformation came, and the era of large ecclesiastical buildings came to a end.

With our practical nineteenth century we have too much forgotten the art life. We speak of art to-day as if it were some advanced technical accomplishment rather than as it should be, the bringing out of the best behaviour of things. How often do we see buildings quarrelling at each other, rooms which make us feel at swords' points, colour in wall-paper and carpets which depress us. Up to the last century everything seemed to have gone along very well, but in the last 100 years, the 100 years which have made the greatest progress in the science and arts, it has yet to account for the woeful supply of food for the art life. Oxford is not scientific; Oxford is artistic. Who can measure the influence of her charm upon the cream of England's youth who study within her walls?

Then the scene changes to Rouen, the old capital of Normandy, and although the distance from Oxford, as the crow flies, is scarcely 200 miles, a totally different city in almost every respect. Probably no town of France has so many relics of Mediæval architecture.

The relative importance of the cathedral to the city is generally very marked. The old-time builders insisted that the Lord's house should dominate everything, and be the most conspicuous structure when viewed from any point; it was placed in the heart of the city, and usually its portals were entered from the market-place. The mind instantly recalls how the dome of St. Paul's is still the crowning point of London's pictures; and so it is, too, with Cologne, St. Peter's at Rome, the Duomo of Florence, not to say anything of the smaller cathedral cities—Amiens, Salisbury and Chartres.

The south-west tower of the cathedral, called the Tour de Beurre, derives its name from having been erected with the money paid for indulgences to eat butter during Lent. Most people think this tower more beautiful than the Tour St. Romain, but from this opinion the speaker begged to differ. Both towers are about 250 feet high, or 50 feet less in height than the spire on Holy Trinity.

The front of St. Ouen Church faces the Rue de la République, a broad avenue like our Flatbush Avenue and about the same grade, and like it, too, crowned by a fountain. The fountain St. Marie was designed conjointly by sculptor Falguière and architect Depertthes, and has a fine sky-line. The group at the top represents Rouen seated in an antique ship; the water which gracefully falls over the basins has been aptly termed architectural water, for in this kind of monumental art the French stand unrivalled, and sculpture seems as natural a production to them as patent invention is of the American.

Rouen during the latter half of the fifteenth century and the beginning of the sixteenth century (the period of the discovery of America) was the scene of great building operations. Under such patrons as the Cardinals de Amboise, Rouen for nearly a hundred years was the metropolis of art and taste in France, and was one of the first towns where the splendours of the Renaissance burst forth. To-day it yields to no provincial city of France in majestic and venerable aspect and in the triumph of the ecclesiastical and civil architecture of the Middle Ages.

From Rouen to Nuremberg as the crow flies is about 450 miles, but there is just as marked a change in the architecture as between Oxford and Rouen. Nuremberg was formerly among the richest and most influential of the free imperial cities of Europe, and is one of the few cities that has retained its Mediæval aspect substantially unimpaired. It is still surrounded with its ancient feudal walls and moat, though of late several breaches have had to be made to meet the exigencies of modern traffic. Of the reputed 365 towers which formerly strengthened the walls, nearly 100 remain, and a few of the interesting gateways have also been preserved.

The general effect of Nuremberg is certainly quaintly picturesque, and the desire of her present builders to carry out the lofty-peaked gables and oriel windows and red-tiled roofs of the older houses is certainly praiseworthy, for as one rambles through the crooked streets one is not shocked as in Rouen by some incongruous front of the Parisian style standing beside some old monarch of the olden days, but the new houses, built to the requirements of nineteenth-century wants, are yet within the spirit and traditional style of the city—a true architectural evolution.

The ancient fortifications consist of a rampart encircling the city, provided at intervals with towers of various forms and a moat now dry, over 100 feet wide and 35 feet deep. This moat is now planted with trees, while a broad road encircles it, making a continuous park-like walk around the whole city.

If from our saunterings around Oxford, Rouen and Nuremberg we have felt the majesty of true art, said Mr. Parfitt in conclusion, if we have felt that these cities are dear to us, if we have felt that they have lessons to teach us to-day in our rapidly growing America, and if we have felt the need of more poetry in the material make-up of the trivial round of our everyday life, in our street scenes, in our business haunts, in our churches and our homes, that is all which I have wished to accomplish.

GLASGOW ARCHITECTURAL ASSOCIATION.

A PAPER was read at the last monthly meeting of the Glasgow Association by Mr. John A. Macara, M.A., B.Sc., on "Monuments and Memorials of the Dead." Dealing with the subject in an historical manner, the lecturer described in detail and by means of lantern slides a great variety of tombs and monuments of the different periods of architecture. Egypt, which may be regarded as the birthplace of art, was first noticed, and an interesting account given of the Pyramids and the other commemorative monuments of that country. Passing on, he alluded to the monumental remains of Assyria, Greece and Etruria. Roman remains of this kind are also very numerous, and exhibit many points of interest to the architectural student. Touching briefly on the monumental art of Mediæval and Renaissance times many interesting examples were shown. A short discussion followed, and at the close a vote of thanks was awarded the lecturer.

GENERAL.

The Designs for the Sedgwick Memorial Museum prepared by Mr. T. G. Jackson, A.R.A., have been approved, subject to any modifications in detail that may hereafter be found desirable.

The Foundation-stone of the Bishopsgate Library and Institute will be laid to-morrow by the Rev. William Rodgers. The building will cost over 50,000*l*.

The Winchester College Quingentenary is to be commemorated by raising a fund which will be applied, first, to the restoration of the founder's chantry in cathedral; and, secondly, to establishing a group of memorial buildings for the preservation of Wykehamical antiquities and the encouragement of art, archæology, natural history and other sciences. The buildings are likely to cost 10,000*l*.

A Portrait by Albert Dürer, which belonged to the Rev. H. R. Cholmondeley, was purchased on Saturday by the Director of the Berlin Gallery.

The First Commissioner of Works has announced that a portion of the site at Millbank will be reserved for the purpose of erecting examination-rooms for the London University, in connection with the provision of examination-rooms for the Civil Service Commissioners, but he was unable to say when the buildings will be commenced.

The Council of the Irish Institute of Architects have indicated the Dublin Chamber of Commerce to seek for the extension to Ireland of the Arbitration Act of 1889.

A Statue of Fritz Reuter, the poet, by Professor Wolff, has been set up in Newbrandenburg (Mecklenburg-Strelitz). It is larger than life, and is in bronze.

Mr. William Henman, of Birmingham, has been successful in the competition for the Smallwood Hospital, Redditch, and has received instructions to carry out the work.

The Carpenters' Company have inaugurated a series of lectures at Carpenters' Hall on Wednesday evenings (commencing Wednesday, May 10), on carpentry and joinery. The list of lecturers includes Professor Banister Fletcher, Mr. Thomas Blashill, Mr. Keith D. Young, and Professor J. Roger Smith. The lectures are given with a view to future examinations, and candidates' tickets and particulars may be obtained at Carpenters' Hall.

The "Standard" says:—A most interesting and important antiquarian discovery has been made at Delphi. In the course of the excavations now proceeding under the direction of the French Archæological School, the workers came upon a building having the form of a small Doric temple, which is believed to be the Thesaurus of the Athenians mentioned by Pausanias. Five metopes have also been found, on which the figures of Athene, Hercules and the Centaurs, and many warriors and animals can be distinguished; as well as some one hundred and fifty inscriptions.

Mrs. Parr, of Killiechonan, Mull, has offered to give 2,000*l*. for the building of a cottage hospital at Oban.

The Duke of Sutherland has offered to the Longton Town Council a site in Stone Road for the erection of new municipal buildings.

Sir Charles Tennant presided at the seventy-eighth anniversary dinner of the Artists' General Benevolent Institution in the Whitehall Rooms, Hotel Métropole. The annual report showed that last year over 5,000*l*. were distributed. Subscriptions were announced to the amount of 2,204*l*., including 100 guineas from the chairman and 85*l*. which he had collected.

The Mansion-house of Kirkdale, in Kirkcudbrightshire, has been totally destroyed by fire. It was an imposing structure of white granite, the seat of Lieutenant-Colonel Hannay, and tenanted by Mr. Charlesworth.

The Architect.

THE WEEK.

THE late JOHN M'LACHLAN, who died on Saturday last, was not among the most successful of the Edinburgh architects, but no man could be more esteemed. He was essentially "a good fellow," and when he came to a conference in London several years ago he made friends of all who came in contact with him. Among his qualities was a sense of humour, and it followed that he never excited self-derision by appearing to be greater than nature and fortune had made him. It was characteristic of his wisdom that he avoided competitions. He did not believe he could bewitch committees with noble designs, and left contests of that kind to men who were more ambitious. Mr. M'LACHLAN was fortunate in securing the work of the National Bank of Scotland, and although the branches he built could never be pretentious—for in the North banking is a more simple affair than in England—they are well adapted for business. His general practice was extensive enough to satisfy him, and clients must be exacting who were not gratified with the efforts of so honest a man. It is certain that he never gained a commission by undervaluing the competence of one of his brother-architects or by puffing himself. He was honourable in all his ways, but without affectation of that austerity which is common in the professions of Scotland. Mr. M'LACHLAN was one of the pupils of DAVID COUSIN, who was city architect in Edinburgh, and for over twenty years he practised there and secured the respect of all who transacted business with him.

A MAJORITY of the Sheffield Town Council have rejected the proposal of the architect (although approved by the Improvement Committee), that the walls of the staircase and principal corridor in the new town hall should be lined with marble at an outlay of 2,335*l.* There is no doubt that marble is more pleasant to look on than ordinary stone, but an important item of that kind should have been included in the original plans. It was considered that if the marble was allowed other extras would also be submitted. It was originally determined that the building was to cost 80,000*l.*, and under the circumstances that sum should be adhered to. No doubt it seems illiberal to deprive some of the aldermen and councillors of the satisfaction of seeing marble when they visit the town hall. But in many other places members of corporations have to submit to a similar deprivation without any diminution of their zeal in the service of the public. In cases like the Sheffield Town Hall, where designs are obtained by competition, it is the duty of the authorities to be rigorous in not allowing the prescribed sum to be exceeded. The laxity of committees who allow themselves to be persuaded about the advantage of having one improvement after another introduced in the course of the building operations has burthened many towns with an excess of taxation, for it is astonishing how much beautifying the simplest building can stand. It is also most unfair to those competitors who are exact in respecting the conditions. The decision of the Sheffield Town Council is therefore of service in insuring fair play in future competitions, and we trust it will not be set aside out of a weakness to dwell for a time in marble halls.

BUILDERS, like other classes of producers, are compelled to engage in affairs from which speculation is not absent, and if it were universally tabooed there would be an end to industrial enterprise. There is consequently no reason why the term "speculative builder" should so commonly be applied in reproach. A few days ago, in the Hanley County Court, the judge made use of the term to describe a man who would be repudiated as a representative of the builder's trade. An application was made for the grant of an order of discharge in favour of a bankrupt who called himself a builder. The judge said the bankrupt had been

carrying on a business which some people thought a dishonest one, and one that ought to be put down by the strong arm of the law, viz. that of a speculative builder. Such men as the bankrupt undertook contracts at unremunerative prices, and, getting their materials on credit, practically made the contracts at the expense of their creditors. The bankrupt had proved himself quite unfit to be a master, and should be content to be a servant. A man who conducted his business in such a disreputable and extravagant manner as the bankrupt had done deserved no sympathy. In 1878 the debtor started in business with about 50*l.* capital. Three years afterwards he went into liquidation, and a dividend of 5*d.* in the pound was obtained from his assets. Last December he made an assignment of his property, and some of the creditors had received 2*s.* in the pound. It was conclusively proved that, while knowing he was insolvent, he contracted debts. Such a case is, unfortunately, too common, but there is really no speculative element in it. When a man knowingly takes a contract at a price that cannot pay, and obtains materials which he never intends to pay for, the transaction is not a speculation, for there can be only one result, which is easily foreseen. By treating such transactions as speculative, the hands of justice are tied. The bankrupt's discharge was suspended for two years, and he was told that on another occasion it would be suspended altogether, but he and men like him merit chastisement of another sort, from which they are exempted because they are designated speculative builders.

In spite of the rival attractions at the Imperial Institute the Westminster Town Hall was densely, if not uncomfortably, crowded on Wednesday, when the annual soirée of the Architectural Association was enjoyed. The success of last year's dramatic experiment (for it would be unjust to describe so sterling a piece as a burlesque) inspired expectations in the minds of many who admire originality in stage literature, and they assembled in battalions rather than in single files, but with becoming reverence. This year the drama was entitled "Mythology run Mad, or the Chumps de Mars," and as before, it was from the practised pens of Messrs. THEO MOORE and ERNEST RÜNTZ. It is needless to say that the authors were inspired by the exalted educational spirit which has gained not only a name but a local habitation for the Architectural Association. The principal scenes were supposed to take place on the Acropolis, which is as sacred a hill for the Association as for the Athenians. Among the *dramatis personæ* were ZEUS, PHEIDIAS, MERCURY, CUPID and VENUS, names that are associated with the buildings of England as of Greece. Consistency is found to be an obstruction to freedom in all classes of compositions, and the poets wisely refused to be confined within chronological or other limits. They introduced among the representatives of the older mythology we have named Sir CHRISTOPHER WREN, the great patron of ghosts; and the untitled but hardly less famous surveyor of the Waxchandlers and other harbingers of light, JOSEPH GWILT. Their eyes also rolled in a fine frenzy as they glanced from heaven to earth, and such is the creative power of genius that natives of the county Dublin and Chicago became rivals of the Olympians. We hope, however, that members of the Association will not lose their interest in the Protectress of the Parthenon because they were affected to tears by that kindly representative of Green Erin, Mrs. MORIARTY, who, it appears, could also claim near relationship with the goddess of the thousand temples. All delight must have an element of sadness, and we suppose there were few of those happy people who were privileged to be present who did not regret that the royal lovers, the Indian princes and the Prime Minister were fated to be elsewhere, and were unable to witness a display of the histrionic art in which past and present, east and west, music and painting, dancing and singing, age and youth were combined to give homage to architecture and the Architectural Association, and immortality to the authors. Next week, when some of the fascination of the festival has evaporated, we hope to be competent to analyse the poem, which has qualities that compel us to wish that the laureateship could become a partnership transaction.

EARLY CHRISTIAN MOSAICS.

THE value of mosaics as a sort of connection between ancient and modern art has been admitted. When the race of great artists became extinct, the process of forming mosaic pictures appeared to be adapted to suit the aptitudes of inferior men. It was suitable also for the preservation of ideas in ages of tumult. Statues, paintings, works in the precious metals, ivories, miniatures, manuscripts, attracted the notice of invaders, however barbarian, and if not vendable, their destruction at least was an entertainment. But mosaics were safe as long as the buildings containing them were allowed to stand. It is remarkable that the Christians should be eager from an early period to utilise the art, not merely for pavements, but for the adornment of vertical and curved surfaces. In the Catacombs it was difficult to obtain satisfactory grounds, and the lighting might be called "a darkness visible," that was not adapted to display gradations of tesserae. But the enduring qualities of the pictures were so figurative that even in the Catacombs mosaics were to be seen. It could be said of the early artists, as of the men who raised the marvels of Gothic architecture, that "they dreamt not of a perishable home who thus could build." Amidst defects that occasionally make us think of the experiments of untaught children, we can perceive evidence of aims which there were no hands to adequately realise. The figures, with all their defects, have often fascinating power, as if they were phantoms of another world, and we may doubt whether the defects are the result of inability so much as of mysticism.

The peculiarities of mosaic work also seem to be in keeping with other forms of Christian art. In it, as in metalwork, illumination and carving of ornamentation, opportunity was given for placid labour in which thoughts could be occupied with exalted but unworldly subjects. A large mosaic afforded employment for many monks or religious laymen, who could say without exaggeration, "Laborare est orare." There is an absence of excitement about the figures which suggests that designers and operatives were generally in a contemplative mood. For these and other reasons mosaics must always have interest for the student of the history of art.

But there are aspects of the work which have not received sufficient consideration. The materials employed, their derivation, the manner of using them or the technique of mosaic-working, should have interest for artists, chemists, manufacturers and students of history. There is, however, so much obscurity about the art that few have had the courage to carry their investigations far enough to reach the early period. Much importance must therefore belong to the essay on the mosaics of the first Christian centuries which M. EUGÈNE MÜNTZ lately read before the National Society of French Antiquaries. It is one of those efforts which can only be expected from archæologists whose knowledge is as wide as their enthusiasm, and to whom the past is as vivid as the life around them. Brief as is the essay, it contains enough to inspire investigation, and it shows, too, how the clergy, overseers of restoration and even workmen can often add to our knowledge of the technique of the mosaicists.

It is a common desire to obtain the most summary expression of the qualities of things, and much appeared to be gained when it was declared that the difference between Classic and Christian mosaics was that one was made up of tesserae of marble, and the other of enamel, paste or some preparation of glass. There is no doubt the Romans made much use of marble in their mosaics, especially in pavements, but they were not indifferent to the utility of tesserae of glass. What was the Golden House of NERO except a building that had walls lined with mosaics, consisting of tesserae in which a leaf or film of metal was covered with a glazed but transparent coating? In the Pompeian houses fragments have remained unfused of enamels which are arranged in a variety of designs. The Naples Museum has a variety of examples of the kind, and amongst them are columns of stone which were covered with enamels. Tesserae of blue enamel have been found in the ruins of ADRIAN'S Villa at Tivoli, and cubes of various colours in the grounds of the Villa Borghese, in the Baths of Caracalla, on the Palatine, at Ostia, as well as in

towns of Roman Gaul, in Cologne, and elsewhere. In many cases the enamels were confounded with marble, and an acceptance of their existence would diminish the effect of the phrase "stony carpet," which is a favourite with writers on ancient Rome and compilers of guide-books. But the study of PLINY ought long ago to have taught scholars that enamels were in use. When, for instance, in describing the theatre of SCAURUS, he employs the term "e vitro" in reference to the columns of the intermediate stage, there is little doubt, as M. MÜNTZ points out, that PLINY was treating of columns which were encrusted with mosaics. The use of glass or enamel for incrustations was known long before Rome had palaces. Like so many other processes, it was employed by the Egyptians, and, for all we know to the contrary, they may have derived their knowledge of it from some other race.

We may suppose, therefore, that the early Christian artists were not the discoverers of the advantage to be obtained by using tesserae of enamel, that is to say, of glass coloured by the aid of metallic oxides. But there is no doubt they employed enamels so generally as to give some warrant to the conclusion that there was a relation, it may be only of a symbolic kind, between prepared glass and the new doctrines. Blues, for instance, were indispensable for the representation of the garments of certain saints, and as minerals of the colour such as lapis lazuli were extremely costly, it was necessary to produce the colour by the vitrification of substances. That there was no objection to the use of colours which nature provided is evident from the white and grey parts of some mosaics which consist of tesserae of marble. M. MÜNTZ says that the white parts of the vestments, and it may be, the ornaments in the most interesting mosaics of St. Vitale, at Ravenna, are of marble.

In the Church of the Nativity, at Bethlehem, the brilliant parts of thuribles and candlesticks were rendered effective by pieces of mother o' pearl. That material was also employed in the Coptic churches of Egypt, at Ravenna, Parenzo and elsewhere. A close investigation of ancient works might reveal the more frequent use of colours that were not manufactured. On the other hand, TEXIER was unable to find any natural stone in the mosaics of St. George, Salonica, which date from the sixth century. According to him, the blue tesserae are composed of cobalt and blue oxide of copper; one red was derived from ochre or oxide of iron; another red enamel much employed for flesh was similar to the purpurine, that consists of silica, potash and protoxide of copper. The violets seen in vestments were prepared from manganese. How the intense black was made remains unknown to colour-makers. Oxide of copper were also in use for green enamel. Yellow was obtained from antimony and white from oxide of tin.

Where were the chemical operations conducted that were requisite to produce the coloured enamels? Were there local laboratories or were the tesserae imported from one place? These questions cannot be solved. In spite of the extended knowledge of science in our time, it is well known that Venice and Murano supply the greater quantity of the tesserae that is used in other parts of the world. In France a most patriotic attempt is now being made to enable mosaicists to be independent of Italy; but in spite of all that has been accomplished it is still as unavoidable as ever that the orders for tesserae of particular colours must be sent to Murano. Frenchmen have also to submit to the inconvenience of seeing very crude colours for the sake of the support of a new industry. Can we suppose that ten or fifteen hundred years ago it was more easy to manufacture enamels than it now happens in Paris? May we not rather conclude that the refugees who found security among the islands of the lagoons, in the first years of the fifth century, discovered the value of the materials about them, that the making of enamels was one of the earliest of the industries, and that supplies of tesserae were among the earliest exports? M. MÜNTZ shows that in 1359 one DONNINO, a Florentine, contracted with the authorities of the cathedral of Orvieto to supply the enamels that were needed for the restoration of the mosaics of the façade, and to obtain them from Venice. It is not improbable that in the arrangements the precedents of the earlier Mediæval period were repeated, as well as those of a more distant age. Simple as they may appear, tesserae need more than chemistry and machinery can always supply if they are to

constitute a mosaic picture that will be gratifying to the eye, and among people who were more susceptible to harshness or disagreement of colours than we can be in modern cities, it was necessary to be careful in the selection of materials. Ravenna would be likely to rebel if such a mosaic as was lately completed in the Louvre had been introduced in the humblest of the churches.

There is another question no less interesting but hardly more soluble that is started by M. MÜNTZ. In our days it is necessary to have elaborate cartoons for the use of the mosaicists. Owing to the modern organisation of industry the mosaicist's art is becoming more and more mechanical, or rather machine-like, and he or she is not allowed to exercise any thought. Were the earlier mosaicists treated more rationally? It is supposed that in the days of the BIANCHINI and ZUCCATI some members of the craft in Venice were compelled by the authorities to depend on the painters for designs, while others were allowed to carry out their mosaics without external aid. Now the question that M. MÜNTZ proposes is whether in earlier periods the mosaicist followed a cartoon, and if so, who was the author of it? A most important contribution towards the attainment of knowledge on the subject has been furnished by M. RIOLO the elder, who is superintendent of restoration at Palermo. He has scrutinised the ancient mosaics in that city as well as in Cefalu and Monreale. From what was revealed to him by the display of the grounds, he believes that at first the subject was painted on the ground. When the painting was completed the mosaicists covered it with tesserae of corresponding colours, and in that way were bound to express not only form but colour with exactness. Sometimes there was a colour convention which was only indicative. For instance, red was employed in places where gold was to be seen and yellow marked where grey, blue and even black would appear.

It is remarkable that the tesserae used in the mosaics of the Christians are generally larger than those found in Pagan works. Where mosaics were employed in the decoration of domes or the upper part of walls it was not necessary to have the blocks as small as those seen on panels which are on a lower level. Tesserae of various sizes were sometimes employed on the same work. Those in the heads were smaller than the tesserae of garments. SALZENBERG observed this peculiarity in the mosaics of St. Sophia, and M. MÜNTZ found a similar variety in the portrait of Pope JOHN VII., which is a work of the eighth century. It is one advantage of photography that we are enabled to observe differences of that kind in the execution more accurately than is possible from drawings.

It was said by LE VIEL, in the last century, that mosaics can resist atmospheric action, and that in pavements or walls time increases instead of diminishing their *éclat*. Shopkeepers know that the finest plate-glass in windows is affected by time and the weather, and that objects exhibited in consequence become less attractive. It would be strange if glass in mosaics was exempt from the universal law of decay. On the contrary, the compound nature of the tesserae, which is a necessity of having a coloured surface, renders them liable to changes. When, for instance, we learn that the mosaics in the church of St. Paul outside the Walls in Rome were tarnished by a deposition of sea-salt, it is allowable to conclude that the enamels have attraction for deleterious substances. The fragments which are met with in the soil at Rome are found to be more or less deteriorated; sometimes the colours are completely changed. Humidity is the worst enemy of mosaics, and but for it the renowned works in Ravenna would display truer colour. It is when used for the decoration of the exteriors of buildings that mosaics are exposed to most danger. The Byzantine artists were aware of the risk, and it would seem as if they were under a sort of compulsion when they coated façades with their work. They endeavoured also to protect their mosaics by projections that would diminish the effects of variations of the atmosphere, but they were rarely successful. The records which M. MÜNTZ has transcribed concerning the mosaics of the cathedral of Orvieto in the fourteenth, fifteenth and sixteenth centuries, probably correspond with those relating to older works in the early centuries. The mosaics were executed between 1358 and 1362. In 1402 it was necessary to restore parts of them and the work was entrusted to

Pater FRANCISCUS ANTONII. In 1243, BARTOLOMEO DE PIETRO had to be called in to remedy defects. In 1485 and 1506 there were other reparations. RAPHAEL, a Florentine sculptor, was employed on the mosaics in 1552. In 1558, Master GIOVANNI ANTONIO BIANCHINI, a Venetian, undertook the restoration of the mosaics, and in 1573 Master STEPHEN operated on them. No better evidence could be given of the instability of mosaics when employed in exterior works. As the nature of the risks is now ascertained, it may not be an impossible feat to produce enamels that will resist climatic influences, and cements that will keep tesserae in their places. Some experiments made in England warrant that expectation.

M. EUGÈNE MÜNTZ has also investigated the history of mosaics in the Catacombs. He proves that much exaggeration has arisen over the extent and importance of the work in the subterranean places of worship. At the same time he describes what has survived, and from which we may infer the character of the earliest mosaics of the Christians. His essay is of value, not only as a scholarly contribution to the history of the art, but as pointing out the subjects relating to mosaics which archæologists can investigate with advantage to themselves and others.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Institute of Architects took place on Monday evening, Mr. J. Macvicar Anderson, president, in the chair.

The death of Mr. George Powell, architect, was announced. Professor G. BALDWIN BROWN, M.A., read a paper on

How to use Vitruvius.

Professor Baldwin Brown explained the object he had in view in his paper, but he thought no apologies would be needed, as the Institute scheme of examination demanded the historical study of architecture. The matter in his paper had little relation to architectural problems of the present day, as Vitruvius would not directly help the modern architect, and the study of Vitruvius belonged rather to the literary side of architecture than the practical side. There was this advantage, however, that in these days of exploration and excavation of the works of the past, and of archæological research, such explorations were carried out best by practical architects. The paper was merely meant to be a guide to those who were not far advanced in the study of Vitruvius. How to use Vitruvius was his theme, rather than the value of the work. Vitruvius was an architect and a military engineer, and the work he wrote consisted of ten volumes. In it Vitruvius gave some details of his own career, and mentioned the sources whence he derived his knowledge. What gave great interest to the work was the fact that it was the only fairly complete survival of technical literature in the past. It would be rash to assert because of its survival that it was a better work than its contemporaries. It had survived, however, and enjoyed a great reputation. The MS. of Vitruvius disposed of the contention that the work was a figment of some writer of the tenth century. There seemed little doubt that Vitruvius, as we knew it, was substantially the same as that handled by the early Cæsars. Professor Brown alluded in proof of this to quotations made by early writers, also to the parchment folio brought to light in Vienna—an epitome of the work by Faventinus, who stated he had summarised it for his own use. This document belonged to Roman times. Sidonius, bishop, made mention of the plumb-line of Vitruvius, showing his recognition as an architect in the fifth century. Vitruvius acknowledged that he drew his materials chiefly from Greek writers, and he did not describe the buildings rising in Rome in his time, buildings which continued to progress for the next three centuries. The lecturer next gave details as to the oldest copies extant, and considered that we probably owed the preservation of the work to Charles the Great. He next referred to later editions and to the first illustrated edition; to the influence of Vitruvius on the students of the Renaissance period, which could be traced in all the literature down to the later Renaissance time in Italy. The advance of criticism in the present day was opposed to the principle of authority. Everything had to submit to the ordeal of criticism, and there was a danger lest the old superstitious regard for Vitruvius should be suddenly changed into depreciation. Hardly any of the modern standard editions fulfilled all requirements. The best was that by Wilkins, and he was the only one of the commentators of Vitruvius who was an explorer and who had compared the descriptions in Vitruvius with actual remains. For three centuries philological students had laboured. It was now the turn of archæological students to bring the spade to bear on Vitruvius. The archæological spirit of the age led them to hope for a new edition of Vitruvius. Though of late years other nations might have

done more in archæology than this country, it could at any rate be said that we were abreast of all. The student who approached Vitruvius from the artistic and historical point of view would put aside certain volumes, and eliminating from the others various discussions, give his attention to the remainder, consisting of archæological and literary matter, especially to what related to materials, planning and laying out, and to the disposition of the orders in important buildings. Some such rough subdivision would be useful. The part dealing with the orders must be taken with some reserve by the modern student. The reasons for this Professor Brown gave later more at length. He went on to say that Vitruvius was born B.C. 90, and had received a good education, was known to Julius Caesar and appointed to a military command. With all his influence, his practice as an architect was but small. It was to have been expected that he would make use of his opportunities. As he did not do so, the conclusion was that he was not a man of shining parts. In a literary capacity also he showed incompetence, and his scientific studies made him a theorist rather than a practical man. This no doubt stood in his way, but whatever the cause of his failure, he was found to be a querulous quarreller, "short, old and ugly, of few means, but scorning to use the means of other architects; on his book would he rest his fame and posterity would do him due honour." This indeed came true, but the effect produced by Vitruvius on Augustus and his era was *nil*. Certain definite dates were scattered up and down the work, but it was difficult to decide whether it was the work of the great part of his life. There was no mention of the new fashions of the Augustan period, B.C. 21. The *Thermae of Agrippa* had been opened in his time, but they heard from Vitruvius only of the more humble baths, gymnasias, &c., of the Greeks. Concrete, on which Roman architecture so much depended, was scarcely recognised by Vitruvius, and that showed he was ignorant of the materials at *Puzzolana*, which had not then been tapped. After further investigation of the subject of the date of Vitruvius's career, Professor Brown remarked that the technical passages in the work were written in more simple and flowing terms than the more ambitious portions. The descriptions of plasterwork he alluded to, probably the best plasterwork ever produced. The art came from Greece, and Vitruvius described it as carried out in the Greek fashion. Chapters were to be found which took the reader through the whole series of the finest processes. After describing these at length, and saying that each of the three coats of mortar and sand were applied respectively as the last began to dry, there were three finishing coats of crushed marble and lime so carefully prepared by the Greeks to produce the final polish that left the wall gleaming white like a mirror. Later on slabs were often cut out of these walls to be inserted by persons in their rooms. The processes of the fine modelling in stucco Vitruvius did not describe, but he gave valuable descriptions of the processes of colour and fresco decoration. The canvas and primings used by painters were small matters contrasted with the careful preparation and finish of walls to be painted on, and Vitruvius had high ideas in regard of plaster work. Even the white gleam of the polished plaster he described as showing through the pigments with a good effect. Professor Brown spoke of the absence of descriptions of the great works carried out by the Romans, and among those the stupendous aqueducts carried on series of arches as seen at *Albano*, and noted that in his description of forums and theatres he had recourse to Grecian examples. The Grecian forum was, however, only an adjunct of a market-place. Too much attention had been paid to the descriptions of works personally unknown to Vitruvius, and matters within his knowledge on the contrary ignored. It was difficult to suppose that Vitruvius had ever paid a visit to Greece. Vitruvius gave Ionic as the standard order, depending probably on literary authorities. Two authorities he seemed to have relied on, *Pythius* and *Hermogenes*, architects working in the Ionic orders, the former being the architect of the *Mausoleum* and the *Temple of Athene Priene*. Having examined these descriptions by the light of our actual knowledge, Professor Brown deduced that the views of Vitruvius were practically useless in regard of temples, especially Doric temples, and also on hypæthral lighting. That the Ionic was considered by him, and not the Doric Order, showed he derived his views from others and not from personal acquaintance. He gave credit to Vitruvius in regard of his formulæ for secular buildings, which applied well in the case of porticos, showing that his writings would be of use when studying the secular buildings of Greece. Professor Brown, in concluding his paper, alluded to the capability of modern architects to build in all styles, to coquette with them all, and hinted at a wiser mode of eclecticism, and that so far the Greeks still remained the preceptors of our progressive artists where mass and proportion were aimed at.

The PRESIDENT said he saw several literary gentlemen present. These he named, and asked them to address the meeting.

A vote of thanks, proposed by Mr. Robert Kerr, seconded by Mr. George Aitchison, A.R.A., and supported by Mr. Statham, Mr. John Slater and Mr. Wm. White, F.S.A., was passed by acclamation to Professor Brown for his paper.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual meeting of this Association was held on the 10th inst., Mr. W. W. Robertson, president, in the chair. The reports of different officials were submitted, that of the treasurer showing that the income for the year, including a balance from the previous account, was 325*l.* 19*s.* 6*d.*, and the expenditure 250*l.* 11*s.* 3*d.*, leaving a balance of 75*l.* 8*s.* 3*d.* at the credit of the Association at the end of the year. The reduction of the credit balance, it was explained, was caused by the extra expenditure incurred during the year in removal to new premises, prizes for the work class, and the cost of illustration. The total membership of the Association, it appeared, was 279. Mr. W. W. Robertson was re-elected president. The other appointments were:—Vice-presidents, Dr. Rowand Anderson and Mr. Thomas Ross; secretary, T. Fairbairn; treasurer, Mr. J. Johnson; and librarian, Mr. Ross. Mr. Blanc, A.R.S.A., read a paper on *Corstorphine Church*. At the outset Mr. Blanc spoke of collegiate churches in general, and said they came next in importance to abbeys and succeeded them. *Corstorphine Collegiate Church*, dedicated to St. John the Baptist, was erected by Sir John Forrester in 1429, and originally comprised a chancel, nave with north and south transepts, and sacristy, western tower and porch. The nave was enlarged and the north transept extended about the beginning of the present century. Mr. Blanc next dealt with the tombs of the three members of the Forrester family, and concluded by a reference to the *sedilia*, *piscina* and other features of the church.

The President delivered an address. At the outset he dealt with the relation of the Royal Scottish Academy to architects. When after considerable delay, he said, the new charter was granted to the Academy, without the prayer of the petitioning architects for a public inquiry being granted, most of them must have felt that their action was fruitless. Looking back to-day, however, they could say it was not fruitless. Eighteen months ago there was not a single architect in the Academy, to-day there were nine. Was there any doubt, he asked, that this change was in part due to the unavailing protest of a few years ago? He did not say this by way of detracting from the grace of the Academy's recent action, but on the contrary he noticed it as a public acknowledgment of the fact that at the close of an embittered controversy, as soon as its hands were free, the Academy set itself so far as was in its power to redress some of the evils complained of. The election to the Academy of nine architects was a guarantee that in the future architecture would never again be entirely ignored by it. He pointed out, however, that the movement of the architects in the matter of the new charter was not one simply for the admission of some of their number into the sacred precincts, but that their principal object was the advancement of art. After bestowing some cordial praise on the work of the new School of Applied Art, and dealing with the work of the Association during the year, the President referred in conclusion to the controversy initiated by him upon the duty of architects in relation to ancient buildings. He commented upon the good done by the discussion in directing attention to and stimulating interest in the subject, and expressed the feeling that the debate had disclosed a great amount of agreement. They were agreed as to the paramount duty of preservation, to which he attached the greatest importance. The discussion was further useful as illustrating the revolution which had taken place in our means of restoration. Speaking especially of Dr. Rowand Anderson's views, the President said he liked his practice, as shown in the restoration of *Dunblane Cathedral*, better than his principles as expressed in some of his contributions to the debate. He was not the first man whose actions had been better than his creed. In regard to their differences he expressed the opinion that they arose not so much over general principles as over particular cases, and he declared that they were far outweighed by their agreements.

On the motion of Dr. Anderson a vote of thanks was accorded to the President.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE annual meeting of the above Association was held on April 26 last at the Meeting-room, Art Gallery, Newcastle-on-Tyne, Mr. J. H. Morton, F.R.I.B.A. (of South Shields) the president, being in the chair. There was a large attendance of members. The annual report was read and confirmed. The committee, in drawing this report for the thirty-fourth session, stated that they were glad to be able to place on record the more assured position and increasing prosperity of the Association. Two prime objects had engaged the attention

of the committee:—First, the engagement of permanent rooms in which to hold the meetings of the Association, the library, &c.; second, the drawing of a curriculum of study for the younger students and a possible alliance with the Durham College. It is hoped that this may be arranged during the next session, the committee having been empowered, at a general meeting of members, to approach the college authorities with full power to negotiate the arrangements for introducing the curriculum at the college.

The engagement of permanent rooms in a central position in the city has no doubt been a great step in advance, and it is now hoped that good use will be made of the room for the reading of papers and the discussion of subjects relating to architecture and the arts generally. It is pleasant to be able to record an increasing membership. Two members, nine Associates and six students have been elected during the session, the roll now standing as follows:—Members, 31, Associates, 41, and students, 22; total, 94. It is also satisfactory to be able to announce that in connection with the Institute an examination qualifying for candidature as Associate of the Institute has been held in Newcastle, at which six candidates sat.

The committee have had several occasions during the session to bring their influence to bear on local authorities, School Boards, &c., in the matter of competitions for public buildings, with a view to obtaining the appointing of professional assessors, unimpeachable dealings, and of maintaining the status of practising architects, and in more than one instance with marked success. As usual, prizes have been offered to students out of the funds of the Association. Mr. Archibald M. Dunn very kindly acted as assessor, and awarded the first prize for the best set of sketches made during the summer to Mr. C. S. Carrington, and the first prize for measured drawings to Mr. W. Tweedy. It is proposed that one or more meetings of the winter session in the future be held in neighbouring towns, in order to extend the influence of the Association. A new bookcase has recently been placed in the meeting-room, and presents of books are asked for. Mr. H. C. Charlewood has just presented sketches from France and Italy, and Mr. W. H. Knowles in like manner has given a copy of vestiges of old Newcastle. The committee of the Institute are thanked for sending a selection of prize drawings, which were duly exhibited. The following members of the Association have passed the R.I.B.A. preliminary examination:—Messrs. E. J. Watson, E. Devereux, W. Reed and M. Martinson; and Messrs. A. Shaw and C. Rochester have passed the intermediate examination.

Excursion meetings have been held at the new Station Hotel, Newcastle; at the village of Blanchland (old church, &c.); at Messrs. Potter's cement works; and the restored church at Wallsend. On December 21 an interesting paper was read by Dr. Gibbon, on "Pompeii: Past and Present;" on January 11 Mr. J. Brown read a paper on "Varnishes," and exhibited a fine collection of gums and other matters; on February 1 Mr. Charlewood read a paper on "Stokesay Castle," and illustrated his paper by a series of carefully prepared drawings and water-colour sketches; on February 15 Mr. W. S. Hicks read a paper on "Fashion in Architecture," and on March 1, Mr. A. B. Plummer read an interesting paper on "Waltham Abbey," illustrated by a series of measured drawings.

Papers have also been read at the students' meetings, and in all cases illustrated by sketches on the blackboard, viz., on "Heraldry," by Mr. J. Twist; "Gothic Mouldings," by Mr. Errington; and "Perspective," by Mr. Boyd. The Sketching Club have held visits and return visits at Seaton Delaval, Hexham Abbey and Ponteland, and the annual social evening was held on January 24, when eighty-five members were present. The financial statement shows a balance in hand of 85/.

At the annual meeting, April 26, 1893, the resignation of the late hon. sec., Mr. F. W. Rich, was received with regret. The following gentlemen were elected to the offices for the ensuing session:—

President—J. H. Morton.

Vice-Presidents—Jos. Oswald and J. Cresswell.

Treasurer—J. T. Cackett.

Hon. Sec.—A. B. Plummer.

Committee—Messrs. H. C. Charlewood, W. S. Hicks, W. H. Knowles, F. W. Rich, J. W. Taylor, H. Badenoch and G. T. Brown.

Auditors—Messrs. W. Glover and J. Twist.

DUNDEE INSTITUTE OF ARCHITECTURE.

THE sixth ordinary meeting of the Dundee Institute of Architecture, Science and Art was held in the Upper Hall of the Y.M.C.A., Mr. William Mackison, the president, in the chair. A letter was read from Mr. Robert McGavin, of Ballumbie, acknowledging his election as an honorary member. The Chairman, referring to the competitive works submitted by various students, and which were exhibited on the walls,

said the competitions had this year been more successful than in 1892, for while then there were seven competitions and eleven competitors, this year there had been eight competitions and fifteen competitors. The names of the students who had been awarded prizes were then intimated. The Chairman submitted a suggestion for the formation of a professional union of the assistants and pupils in the district, remarking that the Association might have its own constitution and office-bearers, and the lads bring up drawings and read papers on different subjects. He was satisfied that in that way they would be able to lay the foundations of future prosperity for themselves, and become ultimately of assistance to the Institute. The matter was remitted to the Council with powers. This was all the business.

TESSERÆ.

Unknown Varieties of Greek Art.

IF, with Pausanias, we could have spent a day amid the splendid dedications and crowded statues of the Acropolis, we should have found many things to astonish us and to widen our notions of classical art, which are far too narrow and conventional, too much shaped by the Roman copyist and the Italian restorer, by the outworn views of Winckelmann and Lessing, and the conventional proprieties of the Vatican and the Capitol. The ancient Athenians were not classical in the narrow sense in which the age of the Antonines or the age of Louis XIV. was classical. They followed impulse freely, but the impulse in turn was kept in check by a clear perception of the conditions under which works of art of various sorts must be executed, and a frank acceptance of traditional types, as well as the sense of what was beautiful and the love of what was natural. One cannot but wish that some copy or record remained to us of the statue of Dütrephe, pierced by arrows, apparently an anticipation of the St. Sebastian of Christian painters, or of the bronze figure of the Trojan horse by Strongylion, with Menestheus and Teucer, Demophon and Acamas looking out from his side, two works of which we have the bases only. One cannot but wish that we could restore the group which represented Athena leaping full-armed from the head of Zeus, or the bronze Theseus lifting the natural rock to recover his father's sandals. One cannot but long for an hour in the Pinacotheca, amid the paintings of Polygnotus and Aglaophon, so infinitely removed from the superficialities and vulgarities of Pompeii. These things are gone for ever, and it is perhaps a poor consolation to know that we have of late become better able to appreciate their loss.

The Palace at Spalato and St. Sophia.

At Spalato the movement of new life was first felt. There is much about the building that is downright ugly, still more that is but a mass of worn-out tradition; but there, first, as far as we know, is visible the attempt to throw off the swathings of ill-understood Greek art, with which Roman architecture had encumbered itself, and to make that architecture reasonable and consistent with the living principles of art. But at Spalato, though the art was trying to be alive, it was scarcely alive, and what life is in it is shown in its construction only and not in its ornamentation. St. Sophia, early as it is in the history of the art, has utterly thrown aside all pedantic encumbrances, and is most vigorously alive. It has gathered to itself all these elements of change, which, having been kept apart for so long, were at last mingling and seething, and bringing about so many changes—so much of death and life. It is not bound by the past, but it has garnered all that there was in it which was fit to live and produce fresh life; it is the living child and the fruitful mother of art, past and future. That, even more than the loveliness which it drew forth from its own present, is what makes it the crown of all the great buildings of the world. The new-born art was long in coming to this. Spalato was built about 313 A.D., St. Sophia in 530. More than 200 years are between them, by no means fertile of beautiful or remarkable buildings; but St. Sophia once built, the earth began to blossom with beautiful buildings, and the thousand years that lie between the date of St. Sophia and the date of St. Peter at Rome may well be called the building age of the world.

The Study of Art.

Every one may perceive from the numerous discoveries made of late in the physical world, and which, by-the-by, are characteristic of the age, how necessary it is to occupy oneself with the concrete, with the particular in science, in order to arrive at just conclusions when regarded as a whole. And from the wonderful manner in which all things are intimately connected such investigation becomes a double gain, for while we fathom the nature of the one component part, all the rest become illumined and more intelligible. And thus it is with art. Here the concrete is the work itself. What, then, have we to do? To leave the abstract idea of art, and, occupying ourselves with the form in which it now appears to us, the

individual work, namely, which a free poetical imagination has brought forth, to endeavour here to find again and comprehend those vital principles on which the conception of art, taken generally, is founded. The peculiar shape it assumes will, of course, depend on the particular province of art and the general laws of that province in which it may appear. But be it what it may, in it will always be, modified according to circumstances, what may be termed the pervading thought of the whole. But it is just in the form which it assumes, the outward form as perceptible to our senses, that this pervading thought shows itself. The first requisite, therefore, of the philosophically investigating mind is to be able to lift this "concrete thought" from out the world of living forms, and to retain it with a firm grasp. That this would be considered by many as too hard a demand we are well aware of, and is a circumstance we shall allude to later. "It appears to us no unfitting image," says Röttscher, "if we compare this first moment of philosophical activity in the treatment of the work of art to a breaking to pieces of the form by which really the beautifully conjoined structure is for the moment decomposed. At first the whole man is possessed by the work of art, and is, so to say, satiated by its abundant fullness; but as a spiritual being he feels the profounder necessity of arriving at a consciousness of the nature of his delight, and thus to sanction it to himself. This very spirit, then, necessarily impels him to break the costly vase in order, undazzled by its splendour and beauty, to gaze on it in its purity." "The beautiful body of the work of art is therefore to be destroyed in order to find its beating heart. By so doing the thinker takes the place of Minerva, who from the body of Dionysus Zagreus, torn in pieces by the Titans, saved the still palpitating heart. And it is particularly for the preservation of this vital part, and with it the vitality of the whole, that all activity is to be exerted." And the doing of this is the first important act in the process so begun. But as when by means of refraction we have unravelled the composition of a sunbeam, we afterwards give it back its pristine unity that it may shine on in all its genial warmth and vivifying power, so the form, which for a moment has been broken, must be again restored. The spirit which banished itself voluntarily from the land of beauty and from the circle of living forms now returns, in order, with a feeling of self-consciousness, to live in this world and understand its language and its sounds. The two are now again united, as intimately united as the soul and body in the breathing man. But, unlike a body of too solid flesh, this one is subject to none of the ills which disturb the calm of the mortal frame; it has no nerves and tendons, it is one which has acquired this positive form by the power of artistic enthusiasm, and, by its plastic faculty, a form of which it may be said "it has cast aside every evidence of human neediness."

Comprehensiveness in Painting.

One of the observations of Sir Joshua Reynolds is that it is by the power of drawing correctly what we see that we are enabled to draw correctly what we imagine. The principles of art are simple and fixed, and they are compendiously enunciated for the student's use in the great examples which the sculptors and painters have left. These results have a classification determined to a great extent by the nature of the materials with which they work. Principles of proportion and form have been deduced from sculpture; those of colour, of light and shade, and of composition have been established on the labours of the various schools of painting. In the works of three of the greatest masters of the painter's art whom the world has produced, severally conspicuous each for a quality of his own—Raphael, Titian and Rembrandt—we may illustrate alike this principle of comprehensiveness in seizing what are the main or predominant characteristics. To begin with Raphael. If we take for our purpose his most accomplished works, the Cartoons, we find on examination that so many details only are given of the human form or draperies as are absolutely essential to the just description of the parts, or are indispensable to their action. By testing this principle of comprehensiveness in arranging draperies, we shall find how many forms in the draperies that were extraneous and unessential to the expression of the human form beneath have been omitted by the great artist. So Titian omits all trivial particulars in representing a mass of flesh-tint. The eye at once recognises the general truth of the part, and is unfatigued by a sense of the elaboration that suggests exertion or great painstaking. In fact, the eye is impressed in exactly the same way as on beholding Nature herself. If we inspect the picture more minutely, we behold a fusion of the tints, corresponding to that which we see in the real flesh and those local peculiarities of colour in particular parts of the limbs, which do not interfere with the general sense of truth or the prevailing air of simplicity of means. Rembrandt, with his light and shade, arrives by different means at imitative results similar to those of Titian. With a power of calculation that controlled every seemingly rude touch to a definite end, distance from the picture is all that is needed to make these singular means combine in the revelation of character, of expression, or of gradation in light

and shade. Rembrandt's production of these results is as much under the control of abstract principle as ever were the linear treatments of a Greek sculptor. Reynolds, in his "Ugolino" and in other historical presentments, combining often the characteristics of Titian with those of Rembrandt, indulged in that degree of imitation which never distracts or divides the attention between the picture in its subjective and objective truth and any personal display of his own powers.

Hogarth and Academy Exhibitions.

It is a somewhat singular circumstance that as Hogarth throughout his life uniformly opposed the establishment of a public academy of arts, he should, by the very course he pursued in encouraging and concentrating at the Foundling Hospital an exhibition of the talents of British artists, have himself promoted a consummation of the object which he had all along deprecated. "In consequence," says Nichols, "of the public attention bestowed upon the paintings presented to the Foundling Hospital by Hogarth, the Academy in St. Martin's Lane began to form themselves into a more important body, and to teach the arts under regular professors. But, extraordinary as it may appear, this scheme was so far from being welcomed by Hogarth, as indicative of a brighter era in the fine arts, that he absolutely discouraged it, as tending to allure many young men into a profession in which they would not be able to support themselves, and at the same time to degrade what ought to be a liberal profession into a merely mechanical one."

Classic Innovations.

In our admiration of ancient architecture we must not be too indiscriminate; the ancient architects were, after all, but fallible men; some indeed among them were strongly endowed with the perception of what was grand and noble in their art, while others were feeble imitators or tasteless innovators. The principles of Grecian architecture, those principles which were sanctioned by an Ictinus or a Callicrates, we may safely follow, but all the practices of individual ancient architects are not to be accounted of equal authority; in Italy many dangerous precedents exist, most of them probably belonging to a period when architecture as well as sculpture was rapidly declining. One instance is found in the high pediment of the Pantheon at Rome, a building to which at the same time we are greatly indebted for setting the example of the beautiful domes which adorn so many of our modern churches. Other ancient Roman buildings, particularly their triumphal arches, gave examples of breaking the entablatures into small portions, a part projecting over each column or pair of columns, thus entirely destroying the great bond of unity in the edifice, as well as preventing the fine effect produced by the depth of shade which a broad and continued entablature casts. Another innovation of the ancient architects on the simplicity of the principles of their art was the piling of order on order, and the mixing together what was essentially distinct: that this innovation was sometimes productive of a good effect cannot be denied; after the example of the Coliseum it would be idle to do so; but undoubtedly it was dangerous, and its imitation has introduced much confusion and deformity into the art; indeed this innovation may plead in its defence some very plausible arguments, from the obvious necessity of giving greater lightness to the upper and greater solidity to the lower parts of the building, as well as the propriety of marking in some degree the nature of the internal arrangement, by the division of parts on the exterior of an edifice. The latter argument has indeed more of apparent than real force, as all that is really necessary is that an edifice should not, by its imposing exterior, excite hopes of internal magnificence to be afterwards disappointed. The placing of columns on pedestals was another innovation, first introduced perhaps from necessity in the Roman triumphal arches; this is destructive of the fine effect of a flight of steps or continued basement, uniting as a bond the building together below, in the same way as it is united above by the entablature; it has besides the further ill effect of changing entirely the proportions of the pillars, as a separate pedestal is, in fact, nothing more than a monstrous base or plinth to the column which stands upon it. Another ancient innovation of no frequent occurrence was the spiral fluting of columns; this practice is inconsistent with the essential principle of straight lines which pervades Grecian architecture, and from its very nature introduces a degree of crookedness and of apparent weakness, which has a very disagreeable effect. This effect the ancients appear to have endeavoured in some degree to obviate by turning the spiral line of a pair of columns in opposite directions, thus opposing one weakness and one obliquity to another—a contrivance which reminds us of the beauty of a person who squints with both eyes instead of one. The Roman Doric, Tuscan and Composite may be considered as meritorious inventions rather than innovations, properly so-called. The Grecian or genuine Doric is certainly superior in grandeur and majesty to its more recent rival, but the latter has some capabilities not possessed by the former.

The Carrara Marble Quarries.

The quarries of Carrara contain four varieties of marble, of which the most valuable is that used by sculptors, the white granularly foliated limestone. This has always been the favourite material both of the artists of ancient Greece and of modern Europe, in consequence of its purity of colour, its delicate transparency, and its granular texture, which renders it much more easy to work than compact limestone. The two great sources whence the statuary marble of Europe has been procured are Paros and Carrara. The Parian marble is the most pure, consisting almost entirely of carbonate of lime, and is, consequently, softer, somewhat more transparent, and of a more visibly laminated texture than that of Carrara, which is frequently mingled in considerable proportion with granular quartz. The latter has, however, no other rival as regards either quality or durability. The other three varieties obtained are the "veined" marble, equal as regards texture to that already described, but traversed by coloured lines which render it inappropriate to the chisel; the "ravacioni," or Sicilian, similar to that produced near Messina; and the "bardiglio," which is of a deep blue colour, but in formation precisely similar to the white. Some of the quarries may be explored with ease and safety, but such is by no means the case with all of them; while, in every instance, the paths by which they are approached are full of peril to the uninitiated. In working the quarries, the huge blocks are first loosened from the mass by blasting, after which wedges are applied until they are thoroughly detached from the rock, when they are shaped into oblong squares, with the exception of the statuary marble, of which the value is so great that the masses are removed intact, then lowered to the *poggio*, or base of the mountain, whence bullock-cars transport them to the Marina, where they are embarked. When the quarry is situated so perpendicularly that the stones incur risk of breakage from a too rapid descent, they are securely surrounded by strong ropes, and placed upon two parallel beams (or *lizzi*) of oak, beneath which lesser beams are arranged transversely. A workman stands upon the block throughout its perilous transit, whose duty is to raise each of these so soon as it is passed, and to hand it to another man in front, in order that it may again be placed securely upon the passage of the descending mass. This is the most dangerous service performed by the miners, as it occasionally happens that the huge block, after shivering for an instant upon its wooden support, yields to the impetus of its own weight, and, sliding from its oaken cradle, rushes headlong down the declivity, rending the stout cables by which it is bound like whipcord, and crushing beneath its stupendous mass the unfortunate individuals employed in assisting its descent. Where the quarry is level, and nearer to the base of the mountain, the *lizza* is dispensed with, and the blocks are allowed to roll down unaided. This operation at times produces a most beautiful and thrilling spectacle, and one of so wild a nature that no description could do it justice. At the *poggio* the blocks thus collected are loaded upon strong, uncouth-looking bullock-cars, composed of three parallel beams of oak, of which the centre one is rather lower than the others; the animals are attached to the carriages in numbers proportioned to the bulk of the stone and the impediments which encumber their path, and the scene which ensues is one of the most extraordinary character. It is a very common occurrence to see ten yokes of oxen harnessed to one car, each guided by a driver, whose business it is to avoid as much as possible the ponderous masses by which the ground is overstrewn.

Early Photography.

It is tolerably certain that in the sixteenth century the darkening of horn silver (fused chloride of silver) was observed by the alchemists, but it was not until the eighteenth century that any examination of the phenomenon was made. Even then the influence of light on the crystallisation of salts first attracted attention, and memoirs on this subject were published by Petit in 1722, by Chaptal in 1788, and by Dizé in 1789. In 1777 Scheele, the celebrated chemist of Sweden, writes:—"Fix a glass prism at the window and let the refracted sunbeams fall on the floor. In the coloured light put a paper strewn with luna cornua, and you will observe that this horn silver grows sooner black in the violet ray than in any of the other rays." Senebier in 1790 ascertained that this white salt of silver darkened in the violet ray in fifteen seconds to a shade which required the action of the red ray for twenty minutes. In 1801 Ritter, of Jena, demonstrated the existence of rays beyond the spectrum, having no illuminating power, but possessing active chemical properties. A similar set of researches were undertaken by Dr. Wollaston about the same time, which also proved the remarkable differences existing between the differently-coloured rays. These researches led the way to the experiments of Wedgwood, the celebrated porcelain manufacturer of Etruria, in Staffordshire, which, beyond all dispute, must establish him as the first photographic artist. From the *Journal* of the Royal Institution of 1803 we copy the title of Mr. Wedgwood's memoir and a few of his remarks, with the

notes of Sir Humphry Davy:—"An Account of a Method of Copying Paintings upon Glass and of Making Profiles by the Agency of Light upon Nitrate of Silver; with Observations by Humphry Davy." A solution of nitrate of silver spread on white paper or white leather was the photographic material employed, and he remarks:—"The alterations of colours take place more speedily in proportion as the light is more intense. In the direct rays of the sun two or three minutes are sufficient to produce the full effect; in the shade several hours are required, and light transmitted through different coloured glasses acts upon it with different degrees of intensity. When the shadow of any figure is thrown upon the prepared surface the part concealed by it remains white, and the other parts speedily become dark. For copying paintings on glass the solution should be applied on leather, and in this case it is more readily acted on than when paper is used. After the colour has been once fixed on leather or paper it cannot be removed by the application of water or soap, and it is in a high degree permanent. Besides the applications of this method of copying that have just been mentioned, there are many others, and it will be useful for making delineations of all such objects as are possessed of a texture partly opaque and partly transparent. The woody fibre of leaves and the wings of insects may be pretty accurately represented by means of it, and in this case it is only necessary to cause the direct solar light to pass through them, and to receive the shadows upon prepared leather." Sir Humphry Davy adds:—"The images formed by means of a camera obscura have been found to be too faint to produce in any moderate time an effect upon the nitrate of silver. To copy these images was the first object of Mr. Wedgwood in his researches on this subject. In following these processes I have found that the images of small objects produced by means of the solar microscope may be copied without difficulty on prepared paper. In comparing the effects produced by light upon muriate of silver with those produced upon nitrate it seemed evident that the muriate was the most susceptible. Nothing but a method of preventing the unshaded parts of the delineation from being coloured by exposure to the day is wanting to render this process as useful as it is elegant." No further investigation of the subject appears to have been made for many years. The failure on the part of Wedgwood and Davy was due entirely to the want of these chemical agents, which were afterwards employed as the fixing materials. Hyposulphite of soda was not discovered by Sir John Herschel until 1819, when he at once detected and described the habitudes of the salts of silver in connection with hyposulphuric acid. Iodine was not known before 1812, when it was discovered by Courtois, a manufacturer of saltpetre at Paris, and bromine was a yet later discovery by M. Balard, of Montpellier. Without these agents photography could not have advanced beyond the point at which Wedgwood and Davy left it.

Botany and Art.

It is the duty of the artist to study congruity in the vegetable forms he brings together, to place every plant in a natural situation, and to imitate the general outline of plants correctly. Some knowledge, of botany is required to enable him to do so with confidence, and the greater his acquaintance with the science the greater will be his capacity for imparting variety to his scenes, without trenching on their truth to nature. But when the artist has to compose a group of small extent where a few figures are represented of a large size in a limited space so near the eye of the spectator that every feature and emotion of the countenance is a part of the picture, then, whether it be a sylvan or a garden scene, there cannot be too faithful a representation of surrounding objects. The simple trunk of a tree has its character, varying with the species—the stem of the oak, of the pine, of the beech, or of the birch—each has its own peculiar surface to be studied by the artist, not to speak of the widely different ramification and foliage of those trees. And so also, and in a greater degree, of the small plants in the foreground. The commonest way-side weeds have a picturesque character. But how seldom do we see a bramble or a wild rose naturally represented, or even a thistle or a dock. The things that figure in many modern pictures for brambles or roses (where the artist is so far ambitious as to attempt a definite representation of them) have no prototype in nature, and would simply remind us of the ornaments of Christabel's chamber, which were "All cut out of the carver's brain," save that they are deficient in the grace and delicacy of the great fancies described by the poet. Surely we want a Wilkie or a Teniers for our woods and hedges, to picture faithfully the wildings of nature. If a stable-yard and a village alehouse can be refined into a graceful picture, how much more might the thousand picturesque nooks of our island supply subjects to the artist who would be contented to study them minutely, and still with freedom, not in the servility of a mere copyist. Even a subject so homely as the garden of the sluggard, where "the wild briar, The thorn and the thistle grew broader and higher," painted with botanical truth and in a genial spirit, would form no bad picture.

NOTES AND COMMENTS.

THE establishment of a school of architecture in connection with Liverpool University College is under consideration. It was decided that a scheme should be drawn up showing details of requirements and expenditure, that the County Council should be approached with an application for funds, and that the following motion should be recommended for the acceptance of the Senate:—"That in the event of funds being secured for the establishment of a school of architecture, providing an architectural studio, a life school and a studio for modelling and sculpture under the management of efficient teachers, the Senate recommend the allocation of the remainder of the Art Chair endowment (say 225*l.* per annum) towards the remuneration of a teacher in drawing from the life." The estimated outlay is 1,250*l.* a year. That would be a large addition to the expenses of the college. As the advantages would be mainly the providing of assistants for the local offices, it is hoped the Liverpool architects will exhibit their interest in the experiment by subscribing liberally towards the expenses. At present they do not appear to have contributed a penny, although they are so anxious to derive profit from the architectural school.

SURREY is one of the smaller English counties, but in the past, as in the present, it was of more importance than many of the larger shires. The volume on "Bygone Surrey," edited by Mr. CLINCH and Mr. S. W. KERSHAW, M.A., which is now in the press, should therefore be of absorbing interest, for it is to treat of history, antiquities, industries, local customs and folk-lore. As the editors say, "Well nigh every parish has its ancient church, sometimes rich in colour decoration, consecrated by holy memories and associations with the past; and quaint, half-timber houses and cottages exist throughout almost the entire area of the county. Ruined castles and religious houses, ancient ways and roads (including the remarkable Pilgrim's Way), relics of prehistoric times in place-names and traditions, as well as curios and old-world customs, are among the various antiquarian features which characterise the story of 'Bygone Surrey.'" When the materials are so abundant it will be easy for the contributors to produce a book that will be valuable. Reproductions of old engravings relating to Surrey will add to the attractions of the pages.

SPALATO in Dalmatia is interesting to architects on account of the Palace of Diocletian, which according to some theorists is one of the most important buildings of the world. The ancient Palatium has much else to show to travellers, and few cities are more suggestive of the utilisation of ancient buildings and their materials for modern uses. Like the rest of the world Spalato has become convinced of the advantage of conferences. It is therefore proposed to hold one this year, probably in the beginning of September. As the subject to be considered is Christian archaeology in all its branches, it has, of course, universal interest. The arrangements for the conference will depend in a great measure on the number of archaeologists who are willing to take part in the proceedings by reading papers or in other ways. It is therefore requested by the promoters that gentlemen who contemplate visiting Spalato, or are willing to aid the congress, will communicate with Professor FR. BULIĆ, the director of the museum and editor of the *Bullettino di Archeologia e Storia Dalmata*, who is acting as secretary, who will be glad to give information. On the committee are Professors NEUMANN and SWOBODA, of Vienna, Monsignor DE WAAL, of Rome, and other specialists. The experiment is novel and cannot fail to receive support.

THE Lower Greensand formation has just been found at the depth of 1,234 feet below the surface, in an artesian boring at New Lodge, Windsor Forest, being made by Messrs. LE GRAND & SUTCLIFF, hydraulic engineers, of Bunhill Row, London. The chalk was struck at 214 feet and found to be 725 feet thick, beneath which there was 31 feet of upper greensand, followed by 264 feet of gault. Hitherto all attempts to find the water-bearing lower greensand under the London basin, which in Kent and Surrey varies from 200 feet to 300 feet thick, have met with no success; but in the present case a problem of great interest

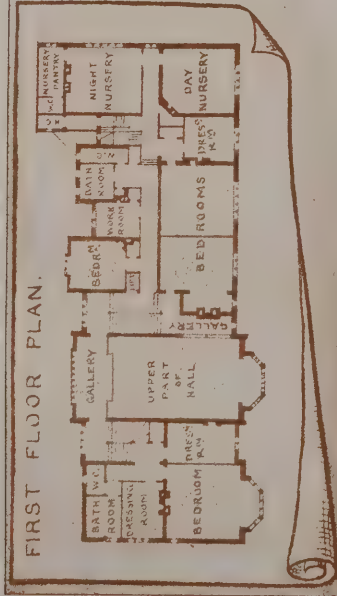
has been solved, for after penetrating only 9 feet into it, viz. at a total depth of 1,243 feet, a fine spring has been tapped and has risen to over 7 feet above the surface, though the site of the boring is 203 feet above the sea-level.

A COMMITTEE of the London County Council, accompanied by Mr. SHIRLEY MURPHY, M.D., the medical officer of health, and Mr. SANTO CRIMP, M.Inst.C.E., engineer, visited the Highgate Museum of Sanitary Appliances on Wednesday, and were met by Mr. H. R. WILLIAMS, chairman of the Hornsey Local Board, and Mr. T. DE COURCY MEADE, M.Inst.C.E., the engineer to the Board, by whom they were conducted over the Museum. The committee were greatly pleased with the numerous objects of interest which the buildings contain, particularly with the sectional model of a sanitary dwelling, and the appliances for ascertaining with some degree of accuracy the flow of air through pipes used for ventilating house drains when fixed under varying conditions. This arrangement of pipes very clearly demonstrates the necessity for avoiding, as far as possible, all bends in the up-cast or extracting shafts, as well as in the drains themselves. The latest improvements and inventions in sanitary work are constantly being added to the already extensive store of information contained in the buildings, and the fact that the Museum has been visited by 8,000 persons since the beginning of this year speaks well for its future sphere of usefulness. It was thought that if such an institution were established by the Council much good would result. The committee complimented Mr. WILLIAMS on the excellence of the collection.

THE appointment of Professor MIDDLETON, of Cambridge, to the directorship of the South Kensington Museum (art division), in succession to Sir P. CUNLIFFE OWEN, is another sign that "My Lords" have awakened to the necessity of seeking outside aid if the Department's work is to be efficiently conducted. The system of raising a high class of officials in the offices at South Kensington has been a failure that is notorious, and it had to be abandoned or the administration must collapse. The days for placing lackeys in the most responsible positions have, we hope, passed away for ever. The new director has no easy task before him. To apply a common expression, we may say that the Museum is not in touch with the schools or the country. The students are not instructed in the way of making use of the collections, and there is no doubt foreigners derive far more advantage from the objects exhibited than the English people. Professor MIDDLETON will no doubt be eager to see his countrymen turning the treasures to account, but that is impossible unless there is a change in the system of instruction in the schools, and his interference in that direction would be resented. One thing he might try to do, and that would be to make some of his assistants obtain as much knowledge about the things exhibited as is now possessed by the constables on duty.

THE London Chamber of Arbitration is a success. According to the chairman, there has been a sufficient number of cases to test the organisation, and those disputants who have had recourse to it speak well of the simplicity, the rapidity, and the efficiency of its machinery. In some of the cases professional representatives have been employed, but the majority of disputants have conducted their own cases. Disputants have submitted to the arbitrator in some instances an agreed statement of facts, and thus dispensed with personal attendants. So far one case only has been referred to the chamber by the High Court, and the expedition with which the case (involving much technical knowledge) was heard and decided elicited expressions of satisfaction from the Court. In about half the cases the selection of the arbitrator has been left to the registrar, and in no instance has more than one arbitrator been employed. Arbitrators have had the legal aid of the registrar in drawing up their awards, save in one case, and then the award was referred back owing to a legal technicality. The arrangements of the chamber, however, are designed to prevent such occurrences. Hearings have taken place on an average within ten days of the submission being lodged, and their duration has averaged two hours; the fees have averaged 5*l.* 12*s.*

The Architect, May 19th 1893.





HOUSE FOR COL. DAVIS, AT WITMEAD, NEAR FARNHAM, SURREY.
RALPH NEVILL, F.S.A., Architect.

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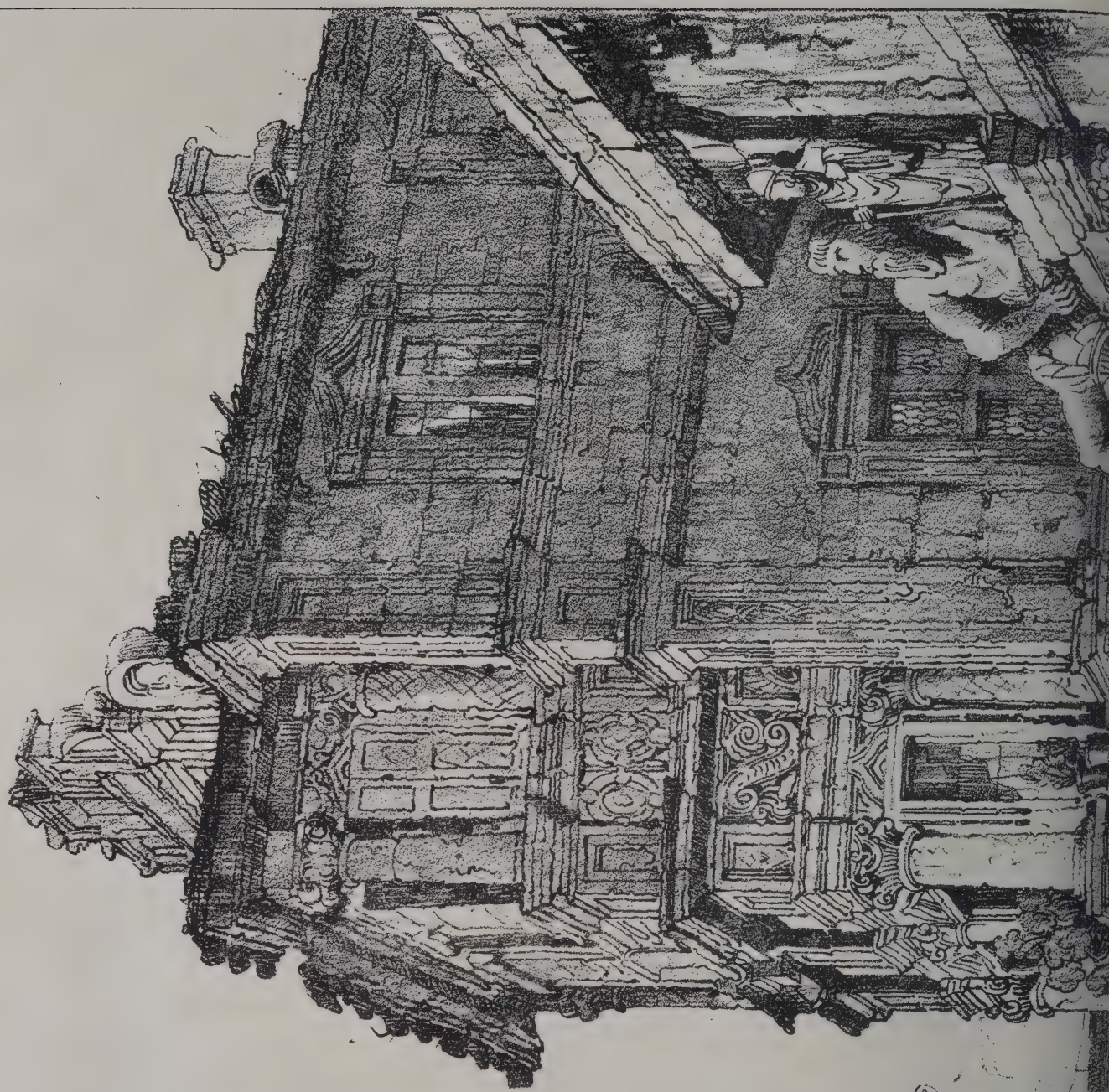
IMPERIAL INSTITUTE, SOUTH KENSINGTON.—A REFRESHMENT ROOM.
T. E. COLLCUTT, Architect.



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IMPERIAL INSTITUTE, SOUTH KENSINGTON.—A CONFERENCE ROOM.
T. E. COLLCUTT, Architect.

The Architect, May 19th 1893.





PART OF OLD PALACE, BAMBERG.
Drawn by SAMUEL PROUT.

PHOTO-LITHO. SPRAGUE & CO. 485 EAST WISCONSIN STREET, MILWAUKEE, WIS., U.S.A.

ILLUSTRATIONS.

IMPERIAL INSTITUTE, SOUTH KENSINGTON.
[T. E. COLLCUTT, ARCHITECT.]

A REFRESHMENT ROOM.

A CONFERENCE ROOM.

* From photographs by Messrs. BEDFORD LEMERE & Co.

HOUSE AT WITMEAD, NEAR FARNHAM.

THIS house is about to be erected near Tilford, for Colonel DAVIS; a lodge already built was illustrated in this Journal last year. A basement, containing larders, cellars, heating chamber, &c., will be built of concrete made of gravel dug on the property and selenitic lime; the latter is also used for all mortar. The building generally will be of red brick in hollow walls, with weather tiles on the south-west side, and Beer stone mullions and dressings to hall and entrance windows, &c.; local red tiles set in concrete plaster will be used for the roof. Advantage is to be taken of a rapid fall in the ground to form a spacious terrace in front, with flights of steps descending to the tennis-grounds and the ornamental water connected with the river Wey. The side, with main entrance, faces north-west, and the front with terrace south-east. The architect is Mr. RALPH NEVILL, F.S.A., of Rolls Chambers, Chancery Lane.

PART OF OLD PALACE, BAMBERG.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary meeting of the Association was held on Friday evening last, Mr. H. O. Cresswell, president, in the chair.

Mr. GUY DAWBER read the following paper, entitled—

The Stone Buildings of the Cotswolds.

The particular portion of the Cotswold Hills to which I wish to draw your attention this evening is the small area bounded by Cheltenham and Winchcombe on the west, by Chipping Norton and Moreton-in-Marsh on the east, by Broadway and Campden on the north, and Northleach and Cirencester on the south. In appearance these wolds have a gentle down-like aspect, falling at intervals into valleys, the sides of the hills abounding with springs. Villages, farms and manor-houses are plentiful, and the country is well-timbered, beech and elm growing specially well.

In these short notes I will not attempt to tell you of the history of these hills—how rich they are in Roman remains. There are everywhere traces of Roman occupation. The Fosse way—one of the most perfect of Roman roads—enters Gloucestershire near Moreton-in-Marsh, and runs in a direct line over hill and dale, through Stow-on-the-Wold, Northleach, and out at Cirencester, once a great Roman station. The beautiful remains of the villa and Roman baths at Chedworth, some few miles from Northleach, are well known. A great portion of these remains are in a perfect state of preservation.

Under the Heptarchy, this county formed the western part of the extensive kingdom of Mercia. Winchcombe and Kingstunley were residences of its kings. This country is also interesting from its close connection with the Parliamentary wars, many of the villages and houses having legends and tales concerning them. At Donnington, a little hamlet lying near Stow-on-the-Wold, the king's forces, under Lord Aston, were so completely defeated by Colonel Morgan in March, 1645, that all hope of maintaining the garrison at Oxford was abandoned. At Bourton-on-the-Hill was born Sir Thomas Overbury, whose death by poison is recorded in the parish register in 1613. Amongst other interesting entries it is also recorded that on October 10, 1666, the parishioners collected a fund of 6s. 8d. "towards the late fire at London."

At Compton, some four miles from Moreton-in-Marsh, are the remains of Archbishop Juxon's manor-house, erected in the early part of the seventeenth century.

Chastleton Hall—not exactly on the Cotswolds—is a very fine house with a courtyard. It is full of most interesting work and detail, having excellent door and window fittings and panellings. The long gallery is a charming room with a barrelled plaster ceiling, panelled in oak up to the springing line. This oak was partly painted and gilt, as is the case at Haddon Hall and other places.

Geologically the Cotswold Hills form a portion of the great belt of limestones, which extends across England from the Dorsetshire coast to a point between Filey and Scarborough. They form an elevated tableland or plateau some 800 to 1,200 feet above sea-level, presenting a steep escarpment facing west to the valley of the Severn.

This escarpment was perhaps a cliff range overhanging an arm of the sea, and the tableland behind has since been cut into valleys by frost, rain and brooks, and swept completely bare of the gravels which lie so thick in the valleys beneath. The strata dip slightly to the south-east and east, and comprise the whole of the oolitic series, a vast mass of more or less continuous beds of limestone, separated by partings of clay, all of marine origin, and enclosing in places vast amounts of shelly matter, such as beds of oysters or reefs of coral.

To architects the whole formation is of unusual interest, as within its limits are found almost all the building limestones used in England. The series commences with the inferior oolitic limestones, which stretch from Bridport northward to Beamister and Sherborne, and broadens out on the flat-topped Cotswolds east of Cheltenham. It is succeeded by a band of the clayey substance, "Fuller's earth." This forms a water-bearing zone amongst the hills, which would otherwise present many arid and barren tracts. The great or Bath oolite has at its base the well-known Stonesfield slate, which splits into coarse fissile slabs, used for roofing purposes.

The main body of the great oolite caps the hills round Bath and ranges over the Cotswolds, where it is very largely quarried. The middle and lower beds are the best stones for building purposes, soft when first quarried, but possessing the well-known property of hardening under exposure.

The stone in the immediate district I am speaking of is quarried from about April to October, after which the quarries are closed for the winter months. It is generally obtained by clearing away the upper layers of inferior stone and earth, and is not mined for, as most of the Bath stones. When fresh quarried it is of a pale lemon colour, which bleaches by exposure, and after a time turns to all manner of rich colours, and quickly becomes covered with lichens. It is an excellent weather stone, as the work in the district testifies. Nearly every village has its local quarry, but the best stones are Bourton Hill, Westington, Windrush, &c., in the immediate district of which I speak.

Owing to the nature of the formation of these hills, and stone being practically the only material usable, we cannot but admire the ingenious way in which the builders used it in almost all their work. The country roads are metalled with it, and bad roads they are as a rule, unless mixed with a harder stone. The fields are divided by stone walls, mostly laid dry, with small stones most ingeniously fitted together—in fact, in a wall properly built it is almost impossible to pull out a stone. The cattle-troughs, gate-posts—in fact, everything for which stone can be adopted are made of this material.

The houses generally are simple in plan and not badly arranged, and in the larger houses, those occupied by the yeomen or farmers, the plan is generally elongated, with a large central hall or reception room, a kitchen on one side, and dairy, &c., beyond, and a general living-room on the other. The stairs lead out of the hall or a passage behind the hall to the bedrooms, nowadays changed to rooms opening off a passage, but formerly opening one out of the other. At this period it was thought injurious to sleep in rooms facing the sun, so most of the original rooms face the north and east.

Mr. Baring Gould says in his "Old Country Life":—

At the head of the stairs slept the squire and his wife, and all the rooms tenanted by the rest of the household were accessible only through that. The females, daughters of the house and maidservants, lay in rooms on one side, say the right, the maids in those most distant reached through the apartments of the young ladies; those of the men lay on the left, the sons of the house nearest the chamber of the squire and the serving-men furthest off.

As a rule the houses—the cottages and manor-houses, and indeed all the larger ones—were built during the seventeenth century or early part of the eighteenth. It is rare to find them much earlier than the last years of the sixteenth century, and this is probably owing to the fact that during the seventeenth century there were more resident gentry in the country than at any other period, and that they mostly lived on the produce of the land, and were not, as a class, at all wealthy.

Naturally these people would encourage building, and, no doubt, their example helped to form the taste of the people and inhabitants of their estates. Hence the uniformity of feeling in the work of this period.

When in the reign of Queen Anne the trade of the country developed, and great fortunes were rapidly made in commerce, many of the landed gentry who had become impoverished, first by the civil wars, and then by the extravagance of the Restoration period, sold their estates and went to live in the country towns and cities. The wealthy business class, who occupied some of these old houses, not being indigenous to the soil, did not take so much interest in the village folk and community at large, and chiefly expended money on their own houses, not having direct ancestral interest in the villages, and so to a certain extent neglected them.

Even in later times, when the labouring classes became very poor, it was no uncommon occurrence for them to be turned out of their villages and their cottages pulled down, so that they

should not become a burden on the parish and the landowners. You will note that nearly all these stone buildings are of the seventeenth century, and in this district you will often find entire villages built during this period with hardly a house of later date, except perhaps one or two erected within the last fifty years. They are nearly always built of rubble stone walling, sometimes coursed, but more generally not, and have dressed angles and stone mullioned windows, &c. The stone laminates freely, and hence there was no difficulty in obtaining walling stone. The walls are thick, 2 feet and more in many instances, and delightful window-seats and nooks are obtained in this way, as the mullioned windows being on the outer face of the wall, the whole depth was given to the room. In some situations these thick walls hold the wet and damp to a very great extent. As a rule, however, they are absolutely dry. Horizontal damp courses were unknown when these houses were built, and the floors were generally of stone laid direct on the earth, unless there were cellars underneath. The upper floors were generally of thick joists pugged solid between with lime and chopped straw.

In Campden, a most unique country village, are some excellent specimens of this period from parts of the court-house, built in the fourteenth century, to houses of the latter end of the last. The old market-house in the centre of the main street was built in 1624 by Sir Baptist Hicks, a former mayor of London, and a great benefactor of the town. One house of the fifteenth century, with a beautiful bay window, carried up two storeys, was the residence of the Greivilles, who were wealthy wool merchants in the fourteenth and fifteenth centuries, and whose memorial brasses are in the church. This now decayed town was full of life and activity, and had a very large wool trade with Flanders—the sheep being raised on the Cotswolds surrounding, and the wool being sent abroad.

I know of no more interesting county town in all England than this, or a more picturesque sight than the main street, with its small islands of building, as it were, dotted about, breaking the continuity of the street, and giving a charming variety to the perspective. Adjoining the church, on a raised terrace overlooking undulating fields and hills, are the remains of a house once inhabited by Baptist Hicks, which was burned down during the Parliamentary wars. At either end of this raised terrace are pavilions. There is a great similarity between the mouldings of these terrace pavilions and those of the Kite's Nest, a manor-house near Broadway, some seven miles off—a house that contains amongst other interesting details a truly magnificent oak staircase, with massive turned balusters and solid newels. These houses were evidently built by the same hands and carried out at the same time, as they are rather later in character than the usual work.

The roofs of all these houses are treated in a similar manner, high pitched at about an angle of 55 deg., nearly all covered with the small stone slates of the district, or else thatched, but this is probably a substitution for the slates in later times. It is rare in this part of Gloucestershire to find the large, thick Forest of Dean slates, and to my mind the small ones are infinitely superior both in appearance and suitability. They are graduated in size and thickness from the eaves to the ridge, where the thinnest are placed.

They are covered always, in the old work, by a stone cresting, generally of plain section, and are hung with oak or deal pins over laths.

Owing presumably to the difficulty of procuring lead the builders of these houses turned their attention to methods of doing without it, and so we find the houses generally so planned that they can be roofed in a single span. Hips are extremely rare. There are always gables with the coping projecting well over behind, the slates tucked close under and pointed flush. The chimneys, too, have a projecting weathering at the bottoms, following the rake of the roofs, and are nearly always arranged centrally over the ridge. The valleys, where one would naturally expect to see lead, are formed of slates in a wide sweep, laid on the curve just as the other portions. The eaves in most of the work project well out on a moulded or splayed stone course, and have no eave-gutters—a bad plan, as the water soaks into the foundations and makes them damp.

The method of procuring these slates is worth noting. In October a piece of ground at the quarry is measured off, and the top, 8 feet or 10 feet of loose stuff, is cleared away. This process is called "ridding." The stone for the slates is then uncovered, and is called "pendal." It is dug out and wheeled to the top of the ground, laid down flat, and roughly fitted one piece into the other as well as it will allow. It lies then all through the winter exposed to the frost in thicknesses of from 2 inches to 12 inches or 14 inches. Owing to the beds of natural moisture in the "pendal" the frosts swell these, and in a thaw a few blows of a hammer separates the layers. When this splitting is done they are squared and cut into sizes and are ready for use, but should there be no frost there are no slates, and the stone must wait for the following winter.

For stone houses there is no more beautiful or suitable material than these stone slates. Even when brand-new they

are beautiful in colour, being of all shades of greys, yellows and blues. To see the old houses, with roofs covered with lichens, and the richest colours conceivable, all harmoniously blended, is charming. If properly seasoned at first they will stand for centuries, and no frost or wet will touch them afterwards.

It seems difficult to understand, with such material in this district, that blue slates, and even galvanised iron—material wholly out of harmony with the building—should be employed. Yet so it is, the excuse being that the stone slates are more trouble to hang and want occasional repairing, in spite of the fact that before one's very eyes are old houses and barns two hundred and more years old still covered with the original roofs. It seems unreasonable to go miles afield to obtain an inferior material, when a better one lies literally at one's feet.

Another matter I should like to draw your attention to is the variety of the stone gable terminations and finials. These latter are especially worthy of note. In no district in England is such a wonderful variety of detail and form to be found.

In Chastleton Hall are many good examples, and in Broadway and Campden and Moreton-in-Marsh they are especially interesting, being pierced and cut in a really marvellous manner. These finials are generally placed on the apex of the gables, but many are also on the springers and knee-stones. As an instance of the way tradition lingers in country places, even in these prosaic days, you may note corn-stacks thatched, with the apexes carried up, and open work finials in twisted and woven straw of infinite variety, showing the influence of the stone treatment in this district.

The windows are nearly always treated in the same way, with stone mullions and narrow lights, about 18 inches from centre to centre, with stout chamfered ovolo moulded mullions, and with labels over the heads, or else a moulded string. Except in the larger houses, transoms and upper lights are uncommon.

The doorways vary. They have either the four-centred arch, such as you will notice on the photograph of Campden Almshouses, or else a square head, with very deep lintel and moulded jambs.

In Broadway is a peculiar instance of the transition from the Tudor to the Jacobean style. The outline of the doorway is distinctly Gothic, having a four-centered head and leaves in the spandrels, but the detail is classical, with dentils worked all round it and down the label moulding.

The roofs are frequently broken up with dormers, and these are treated in various ways, as you will see in the photographs exhibited.

The chimney-stacks are invariably carried up solid until the roof is well cleared, when the flues are treated separately, either square or diagonal on plan, and the cap ties them together at the top. This, however, was the general method of treatment throughout England at this period.

In connection with the windows I must speak of their fittings and their delicate and refined ironwork. Many beautiful examples of these I show you to-night, both in the actual metal and in drawings. Great time and care were spent in the seventeenth century on the furniture of the doors and windows, and some of the iron casement fastenings in these Cotswold villages and houses are beautiful examples of the smith's work. When one considers that these houses were occupied and built for the yeomen and ordinary workers of the land, and that in the humblest cottages fastenings as delicate as the examples I exhibit are found, it grieves one to think that such work in such situations is unheard of in modern buildings. All of these fittings were made by the local smiths in the villages where these houses were built, and from their frequency and variety in this part of England is evidence of a great power of design. In a window in the Kite's Nest, a farmhouse near Broadway, you will notice the ingenious way in which the one handle works the top and bottom catches, and how cleverly the initial S is worked in and dominates the entire design. Can we not fancy the pride and pleasure of the smith in making such a charming piece of work? The door furniture, hinges and lock plates show very great variety, and are evidences of a refinement of thought and feeling quite unknown amongst the rural population of the present day.

Plaster used in a constructional sense is uncommon, though there are a few instances in which the old "wattle and dab" treatment still remains. This is a rough framework of timber, covered with closely-woven and interlaced wicker-work, plastered on the outside face, the whole generally raised some four or five feet from the ground on a stone base. Only barns and farm buildings are treated in this way, and not the houses. In some instances the stone buildings have been stuccoed, probably about the latter end of last century, in a rather original way, leaving the mullioned windows and dressed stonework exposed and the flat wall spaces treated with stamped designs and decorations. Good examples are to be found in Stow-on-the-Wold and Burford, and other places.

The real timber and plaster house is never seen on the Cotswolds proper, but it is interesting to notice that directly one

gets into the Worcestershire and Warwickshire vale, where oak and chestnut abound, the timber treatment commences. At Broadway are some examples, though only fragmentary, and then used in connection with stone buildings and not as a separate structure.

At Todenham, some three or four miles from the Cotswolds, in the Warwickshire vale, is a very fine half-timbered house, &c.

What is the one great lesson to be derived from the study of this old work of the Cotswold district? It may be summed up in two words, "Simplicity" and "Restraint." The more you analyse and look into these old buildings the more you will discover that all their charm depends on the honest, simple and unaffected way in which they are treated.

If you take any of these houses and begin with the plan, you will notice how plain and direct is its purpose, and how suited to the lives and habits of the people who then occupied these houses. The rooms squarely treated, the windows and doors well placed, the fireplaces in the positions where most heat is obtainable (and yet where most effect is gained), all teach us a lesson that in our daily work we should do well to follow. The exterior, with its broad quiet wall surfaces and simple roof, with gables at either end of the building or with one gable standing out to mark the entrance, all tell of a breadth of treatment and a grasp of composition almost unknown to-day.

It must not be imagined that the great charm of these buildings is referable only to the softening and mellowing hand of time. Quiet grouping and dignified proportioning are great factors in their beauty of effect. Each building tells its own purpose at a glance—there is no mistaking the cottage for the manor-house, though one may contain as delicate and refined handiwork as the other. All are treated with a consummate skill and power that show a wonderful appreciation of the beautiful at this period.

I would urge you, in your studies of old buildings, to strive to analyse their composition. Do not merely sketch the quaint bits of striking detail, but try to discover for yourselves what it is that produces the effect you see before you. If you are studying the Cotswolds buildings you must assuredly come to the conclusion that everything depends on their quiet, refined and simple treatment. Try, I repeat, and find out for yourselves how such effects are produced, and study those effects and principles, even more than mere detail. The noblest buildings in all ages depend mainly on their proportions and treatment of surfaces, and I think you will agree that the nobler and simpler the proportions and the broader and quieter the surface, the grander in all respects the building.

Concentrate your grouping so as to give emphasis and point to parts of your design. Let some portions stand out distinctly, yet in harmony with the rest—your doorway, for instance, your dormers, roof or chimneys. Above all, let the enrichment and ornament be so placed that it has meaning and purpose.

Poor sculpture—in this instance I mean carved enrichment and so-called "ornament"—is the bane and curse of much modern work. How many buildings are absolutely ruined and their effect spoilt by being covered with bad carving laid on without object or purpose, in any position where there is wall space? We see many buildings that in themselves are good in their lines and grouping, yet with their proportions marred, their wall surface frittered away, by meaningless, commonplace carving. In the houses of all kinds in the Cotswold district carving is almost entirely absent, but when it is used in the building it tells its purpose, and has point and meaning, and justifies its own presence. In one group of buildings—the almshouses of Campden—a long line of quiet frontage, with a projecting gabled wing at either end raised on a terrace overlooking the road, there is but a single central panel—the arms of the founder surrounded by mantling and crest; and one instinctively turns to that simple carved stone with a feeling of admiration for the artist who designed these buildings, and the restraint he has exhibited in his work.

If you must have carving exercise your judgment and place it in positions where it will emphasise and help your design; do not put bands of carving round your chimneys or under your plinths, as we often see, and do not carve all your cornices and ornament.

There is one great feature about the work of these Cotswold builders—the certain way in which they obtained effect in their buildings. An enriched panel, a carved sun-dial, a coat-of-arms or a band of ornament are far more telling when rightly placed than a wealth of meaningless detail. Words fitly chosen, we are told, "are like apples of gold in a basket of silver." May we not say almost as much of wisely-chosen architectural details?

As a general rule I have always thought that if you design good mouldings with careful regard to their positions, and omit entirely all sculpture and carving, you will have a better building, and one that will live better in years to come than if you had depended on carving for effect.

Perhaps I go to an extreme, but to me bad carving is terrible. It is always an eyesore and an irritant. It is generally coarse and always vulgar—at the best dull and

insipid; but so many buildings are nowadays covered with this meaningless style of work—bodyless griffins swallowing their tales or corpulent cupids with wreaths of flowers—all true "fish out of water," having no regard or relation to the building and forming no part of its composition.

Aim at breadth and boldness in your designs, and cut out all the meaningless detail and detail that has no purpose to fulfil. Group your buildings so that all is harmonious, and look well to the principle of domination and subordination.

You may say that all this applies more to large buildings than to small everyday work, but there is as much design needed and breadth of treatment wanted for the cottage and small house as for the mansion. A speaker at a former meeting of the Association once said that he thought it a blessing that we had clients who put limitations to our work—and I think it a very true remark. If we had no difficulties to overcome, no conditions to fulfil, and no limit to our expenditure, we should soon be lost in a sea of architectural trouble.

It is the having strict conditions to adhere to, and a limit of cost to keep within, that not only gives zest to our work, but also restrains one's too exuberant fancies, and compels us to make the utmost of awkward sites and indifferent materials, though as a rule the more awkward the site, the more pleasure is obtainable in overcoming its difficulties.

Now let me say a few words about glass. Use all the clear white glass you possibly can, and if you must have any painted or stained windows, try and get the very best obtainable, both in colour and design, and worthy of the position it has to occupy. A simple shield and coat-of-arms, a single head or motto even on a riband, well painted and executed, attracts the eye at once. Standing out against the sky like a gleaming jewel, it is worth far more than many windows filled with interesting patterns of indifferent workmanship and material. In the country it is so far more interesting to see nature's handiwork than man's, that one does not care to be shut in by coloured glass when the sky and birds and flowers are to be seen. I know that opinions differ greatly as to large or small squares of glass, but for my part I would, wherever possible, break up the surface of windows into small panes, either with lead or wooden bars, so as to give scale and proportion to the building, and so avoid the bald, empty look of large sheets of plate-glass. Sometimes when these latter are used the rooms are often cold, and there seems to be a draught from the windows. The origin is in the room itself, and is created by the fire. The heated atmosphere of the room is lowered in temperature by impact against the large cold surface of the glass, and returns in the direction of the fire as a chilly draught. This will often account for rooms in which plate-glass has been substituted for the old lead lights being found so cold and draughty. Where the panes are small and the surface broken up, any tendency to this kind of draughtiness is not so noticeable. Of course in some positions plate-glass must be used. For example, where large and extensive views are wanted, and the small panes would destroy the prospects afforded. Still, as a general rule, a window treated as I suggest will be found best for both internal and external effect.

In towns and cities the use of coloured glass is allowable; here unsightly objects have often to be shut out, but in the country you cannot have too much clear glass. A great charm is added to a window by lead glazing in quiet patterns—not too intricate, so as to be fussy or irritating to the eye—but some of the varieties and simple contrasts obtainable by the use of squares and circles are always pleasing.

There are many villages and houses in the Cotswolds where the old glass remains intact, notably in Broadway and Campden, and the villages adjoining. This is generally tinted, from a pale amber tone to almost bottle green. It mostly was cast this colour, but a good deal is referable to age and exposure to the elements. In many of the houses—for the most part on the windows of the staircases—there are devices, crests, or initials painted in some few panes. In a charming early sixteenth-century house the glass in many of the lights has a bishop's mitre, or crozier, or other symbol; but most of this has been taken away, or broken up, and the house stripped of its panellings and furniture. It now, I believe, forms the residence of a ploughman. This fine old house was at one time the summer residence of the Bishops of Oxford, and belongs now to Christ Church College.

Endeavour to make your windows long and low so as to get all the light you can into your rooms—a long mullioned window of some six or eight lights is far pleasanter to sit by than a high window reaching nearly from floor to ceiling. At times a high sill with a wide window-seat is a charming feature in any room. And speaking of windows, I do not myself at all object, as so many do, to sash windows. These, in some instances, can be used with almost better effect than casements, and, if properly treated, always look well.

In country houses it is well to give great consideration to the plan, and your rooms should be well placed with a view to convenience inside, and also appearance outside. Remember that in the country a drawing-room is used nearly all day long,

and should have a southern aspect so as to get all the sun obtainable. It should command the garden, or part of it, and be sheltered from the approach to the house. Your hall should have a fireplace, and should be in a measure treated as a sitting-room, with the stairs close to and yet not opening directly out of it. It should be a bright, cheerful apartment, but with a greater air of dignity than the other rooms. The dining-room in a country house of any pretension should be ample in size—there is no greater mistake than to make a small dining-room in a country house—and the windows, in my opinion, should be placed rather high up above the ground, as this is more especially a room for meals, and will not be used much at other times, though in smaller houses where the dining-room is generally the living-room, it is more cheerful to keep the cill low. There should be a serving-door opening into a servery or lobby and not another room. A door is better than a hatch, which is useless without servants to work together, one on either side of it. At the best it forcibly recalls the city restaurant. The lavatories, &c., should be conveniently placed but yet quite apart, not on any account opening directly out of the hall, but out of a corridor leading to the billiard-room or the garden. It is most essential to provide a good lavatory on the ground-floor for the use of the male members of the family.

Fireplaces and chimneys will take all your time and ingenuity in country buildings, especially, as is so often the case, if your house is surrounded and overtopped by high trees. Without the very greatest care you will find some of them smoke, and all your labours will be thrown away and all your best endeavours nullified. Clients are obdurate where smoky chimneys are concerned, and the most beautiful chimneypiece, the most delightful ingle, is quite lost on them; and naturally, too, if they cannot get near them for smoke. One of the best arrangements is to build the flues with flat ledges, to take the down-draught and prevent the wind beating right down on the fire. Cows and pots are useless in many cases of smoky chimneys.

In conclusion, I would urge all the younger members of our profession to try and spend as much time on the works and in the workshops as possible. It is only there that we can see how our work develops, and note opportunities for improving it. You will find that your happiest hours are spent on your buildings, watching them grow from foundation to finish, and you will regret you cannot be there more.

Nothing is too small or beneath your notice if you would produce a successful building. Try all you can to do your duty, and sooner or later you will reap your reward. Oftentimes you will find the work on which you have spent most time and thought passes unnoticed; but you have the inner consciousness that it is done well, and that is its own true reward.

I would urge all students to try and get on some building from commencement to completion, either under some clerk of works or as one, and to learn thoroughly all the practical part of the profession. No amount of designing and drawing, however excellent, will make up for errors in construction and a want of practical knowledge.

Something has been said lately for and against a country practice. Having been articulated in the country, and seeing nothing but country work and ways all that time, I also can sing the praises of a country practice. You will doubtless all agree that we London architects know quite as much of the way our work goes on as if we lived in the midst of it. In these days, when our work is so scattered hundreds of miles apart, London, in my opinion, is the best centre for an architect, and I quite think we London architects are often as well acquainted with the country as those who live in it, and, if anything, more appreciative of the charming villages and beautiful rural scenes than those who live amongst them.

It must pain us all to see in so many villages the old-fashioned cottages and houses being swept away, and in their place hideous houses, rows in exact imitation one of another, vulgar and pretentious, bringing the artificiality of the town into the country. We hear so much nowadays of the country awakening to a great love of art, of the people appreciating architecture and wishing for a higher ideal in life and work and its surroundings, and yet year after year sees the rapid effacement of such villages as I have described to-night, not only in this particular district, but all over England. Everywhere there is a transformation to the commonplace and sordid, and the old houses and buildings are pulled down or so altered as to be unrecognisable.

There is an old proverb that bids us "take care of the pence and the pounds will take care of themselves." In respect to our old architecture we seem to go on an inverse principle.

We take care of the "pounds"—our great national buildings, our cathedrals, our churches and so on—and yet the poor little "pence," the cottages and small country houses that, in my opinion, are quite as characteristic, and as essentially marking an epoch in English architecture, we neglect altogether and are losing rapidly. Fortunately the Architectural Association does much to uphold the traditions of Old English Domestic

architecture. Its teaching all along has been directed to the cultivation of a love of that simple, homely style of building that finds its most perfect expression in our old country houses and villages such as those I have spoken of to-night.

Mr. R. W. PAUL proposed, and Mr. LEONARD STOKES seconded, a vote of thanks to Mr. Guy Dawber for his paper.

Mr. W. D. CARÖE, M.A., made allusion to the conjunction of Classic and Gothic styles in an old town not far from Wootton-under-Edge. He thought that plate-glass windows were more draughty than lead-light windows. Casement windows fastened up tighter than sashes filled with plate-glass.

Mr. F. R. FARROW said he hoped one result of the paper would be to induce the Association to make an excursion in the Cotswold district.

The PRESIDENT expressed his opinion that students gained more by studying small and simple buildings than by first of all going abroad to study cathedrals. The pictures shown were charming, and showed what beautiful effects could be got by simple means. When Queen Anne style arose he was told it was Low Dutch style. He went to Holland, but found it not. With some irony, the President added that he had not found in Holland the charming effects and features supposed to be seen in Bedford Park. He then put the vote, which was carried by acclamation.

Mr. GUY DAWBER acknowledged the compliment, and said that he believed the large expanse of plate-glass exercised a chilling effect. He did not agree with a previous speaker who spoke of a gentleman who had never properly realised the view from his window till he saw it through lead-lights. A wide and extensive landscape must be seen through plate-glass, and without dividing lines, for proper effect.

ST. PETER'S CHURCH, ST. ALBANS.

A SHORT account of St. Peter's Church, St. Albans, by Mr. F. W. Kinneir Tarte, appears in the current number of the *Hertfordshire Illustrated Review*. The author says:—

These notes on St. Peter's Church must necessarily be somewhat brief, and many interesting facts well worthy of attention must be passed over without comment. This is not surprising when we remember that the history of the site and of the present historical fabric carries us over a period of nearly one thousand years, during which time it has been rebuilt, altered and beautified. It has stood silently overlooking one of the most bloody strifes that Mediæval history records, and priests and kings, in their splendour and pomp, have passed in and out from its holy walls during the Middle Ages. History records that the founder, Wulsig (the sixth abbot), was a man of piety and well-ordered life, who shone conspicuously both in spiritual and secular matters. He encouraged people to come and settle in the town, finding them material and money. In the reign of Edred (about 948), he built churches at the entrances to the town—at the north, St. Peter's; south, St. Stephen's; and west, St. Michael's—each of them on one of the three principal roads leading to his monastery.

I can find no further notes until the time of Geoffrey de Gorham, sixteenth abbot (1119-46), who bestowed the sacred edifice, with all its belongings, to the perpetual use of the infirmary of the monastery, all matters relating to the church being controlled by the priest (infirmarer), in order to provide food and medicine. Abbot Warren (1183-95) assigned the altar offerings for the medicine of the sick in the infirmary, so that it appears likely that the former had been otherwise applied in the interval. In 1253 these were given to the vicar of St. Peter's on the ordination of the vicarage by the Bishop of Lincoln.

The advowson of the vicarage continued in the abbot and convent of St. Albans till their dissolution, upon which it came to the Crown, and was given by King Edward VI., in the first year of his reign, to the College of Fotheringay, in Northamptonshire. But that house being soon after dissolved, it was again devolved upon the Crown, in which the patronage of the vicarage continued until it came into possession of Thomas, Lord Seymour, of Sudley, and, upon his attainder, reverted to the Crown, and was granted, on June 17, 1600, by Queen Elizabeth, to Martin Heton, Bishop of Ely, and his successors; for it appears that King Charles I. presented to it in 1637 by reason of the vacancy of the bishopric of Ely, and after the restoration of Charles II. the bishop again presented to it.

Godfrey, Bishop of St. Asaph, consecrated an altar in honour of St. Nicholas in the time of Abbot Robert de Gorham, and on December 26, 1215, at the request of Abbot William Trumpington, Thomas, Bishop of Durham, dedicated the cemetery. This, it will be noted, was in the year after the removal of the interdict. Probably this was an enlargement, for burials had taken place in churchyards since about 758. Large numbers of persons were buried in the churchyard in 1247, when a pestilence swept over the town.

In the early part of the thirteenth century the church may

possibly have been rebuilt. The only portion, however, of this date that still remains is the west doorway. This entrance is in the centre of the present west elevation, the whole of the other portions of the elevation being of a later date. It is perhaps desirable to mention here that, so far as I can trace, no vestiges remain of the original church built by Abbot Wulsig.

A great calamity occurred on the vigil of the Assumption of the Blessed Virgin Mary in 1254, for during a thunderstorm the tower was struck by lightning, the oak timber-work at the top being shivered and destroyed; and it is further related that an intolerable stench and smoke was left in the tower and church. Building was evidently going on between the years 1335-49, for the parishioners cut down certain trees in the churchyard which were valued at twenty-five shillings, for the use of the work at the church. These people were promptly excommunicated by sentence of the archdeacon, for doing this without the license of the rector, but, fortunately for them, pardon was granted on being submissively asked for. A similar irregularity took place in the time of Abbot Thomas de la Mare (1349-96) and was again repressed.

It was part of the duty of the vicar of St. Peter's to provide one horse for Abbot Richard Walyngforde when he travelled to visit the cell of Tynemouth. A carved cross was erected in 1342 in the churchyard by Master Roger de Stoke, a clock-maker, which he had executed himself on successive Fridays while fasting. It apparently gained considerable notoriety from the fact that miracles were worked at it, and consequently it became the means of drawing offerings. William Puffe was vicar at this time, and he was judged by the Consistory Court to pay a fine of forty shillings to the infirmarer for having appropriated these oblations. It is unfortunate that during the rebellion, headed by Wat Tyler, 1380, the books of the vicar and the Grange of St. Peter's were burnt by the rioters. Richard II., attended by Judge Tresilian and one thousand soldiers, visited the town to try the delinquents, and many of the townsmen were executed.

Though very fragmentary, those who visit the church should not miss seeing the coloured glass in the windows of the north aisle. Gough, writing at the beginning of the century, states that "much of the painted glass was broken by thrusting the scaffold poles through the windows." At the present time the glass is very much "mixed up." The Rev. H. Fowler says:—"Two of the pictures appear to illustrate the life of the patron saint of the church. In the second window from the west is represented the incident of St. Peter striking off the ear of Malchus in the Garden of Gethsemane; the retreating figure on the left is probably Malchus. Our Lord stands near, having His hands bound before Him. The picture in the most eastern window, in the cusped head of the light, is a small figure of an ecclesiastic holding in his left hand a model of a church; his right hand is raised in an attitude of benediction. This no doubt represents the Saxon abbot, Ulsinus, the founder of the church. The subject in the second window from the east is St. Peter preaching to Cornelius. In the head of the light of the window St. Peter is depicted seated on a throne, holding in his right hand a key, in his left a book. St. Lawrence, with his gridiron, appears in one of the small compartments of the tracery." In the second window from the east are the arms of Edmund de Langley, fifth son of Edward III., who died 1402, and whose fine tomb still exists in the chapel of King's Langley church.

Several of the subjects have a horseshoe border, and from this significant fact Mr. Fowler suggests that the donor of the glass was probably a person named Ferrers, some members of whose family resided in St. Albans about 1400, their badge being a horseshoe. A shield of arms on the ceiling of the north transept of the abbey, "Ar., 6 horseshoes Sa.," was assigned to the Ferrers by Clutterbuck. Many payments are recorded in the churchwardens' accounts for repairs to church windows. It is surprising that any glass of this period remains when we find in these accounts that the Colchester prisoners were confined there in 1649, and an item charged for taking down the windows and removing things out of the church. In 1644-45 a man came and obliterated the "Popish sentiments" that were on graves and on windows, for which he was paid five shillings. An interesting note in "Elizabethan England" states "that all images, shrines, tabernacles, rood-lofts and monuments of idolatry are removed, taken down and defaced, only the storeys in glass windows excepted, which for want of sufficient store of new stuff and by reason of extreme charge that should grow by the alteration of the same into white panes throughout the realm are not altogether abolished in most places at once, but by little and little suffered to decay, that white glass may be provided and set up in their rooms."

A guild, consisting of persons of the upper class, under the invocation of St. John the Baptist, held their meetings in St. Peter's Church during the fifteenth century. In a certificate of chantries it is recorded that "The Fraternite, a guild called the Brotherhood of All Saints, is founded in the Charnell Chapel, which chapel is builded within the churchyard of St. Peters."

This is, without doubt, the chapel of the Holy Cross, which stood in the cemetery of St. Peter's Church in the reign of Henry IV. (1399-1413), and which Mr. A. E. Gibbs points out as existing in the year 1634.

More than one anchoress has taken up her abode at St. Peter's Church, for we read that, in the year 1258, an anchoress had a parlour at the church, in which she saw the vision of an aged man, who ascended to the top of the tower, and cried, "Woe to the inhabitants of the land." In this year a great famine occurred, when 16,000 persons died in London. During the stay of King Henry VI. at the abbey, in 1458, His Majesty visited the cell of the anchoress of St. Peter's. In 1479 Elizabeth Katerina Holsted, a widow, was the anchoress. She was consecrated by Abbot William Walyngforde; this was an occasion of great solemnity, the abbot celebrating mass.

On the feast of St. Vitalis, 1427, a synod of clergy was held in the church for the repression of the Lollard doctrines. Three persons were named for the offence of holding heretical opinions, and for possessing books written in the vulgar tongue. Two appear to have been able to clear themselves, but William Redhead, a maltman of Barnet, confessed he had such a book and that he often read it. His penance was rather severe, for he was to offer a wax candle of the weight of a pound in honour of St. Alban. On three Sundays immediately succeeding he was to walk, divested of his garments, around the cemetery of his parish church in front of the procession; after his return to church he should go to the high altar and there offer, on bended knees, the wax candle which he carried in his hand; and as a final remission of the offence, he was to walk with upraised hands through the public street to the Cross, and there burn that execrable book which before he had joyously read.

On May 21-22, 1455, the first battle of St. Albans took place, and among those who fought on the Lancastrian side and afterwards died of his wounds, was Sir Bertram Entwistle, Knight, who (Leland affirms) was buried under the place of the lectorium in the choir. Chauncy in mentioning the incident gives the inscription, which was evidently engraved on brass. Another account (1824) says that "the memorial was a brass figure of a knight in armour, a fragment of which was preserved in the late vestry. The form of the handle of the sword which the knight is represented as wearing is exactly similar to that of a real sword, said to have belonged to Sir Bertin Entwysel, found in digging up the foundations of the chancel during the last repairs. Gough, writing in the early part of this century, says that the brass has disappeared."

The second battle of St. Albans was fought on February 17, 1461—

Upon a Shrove-Tuesday, on a green leed,
Betwix Sandridge and Saint Albans many man 'gan bleed.

Special attention is drawn to these battles because a number of the slain were interred in the church and churchyard. Not many years since a helm and anklets were dug up in the churchyard and are now preserved in the vestry; these, in all probability, were buried with the warrior after one of the battles.

The church possessed a number of brasses at the end of last century. The building still contains several monuments, of which the most interesting, perhaps, is that fixed on the east wall of the north transept, commemorating, in flattering terms, the virtues of Edward Strong, master mason of St. Paul's Cathedral, who died in 1723. This famous mason, be it remembered, was a resident in St. Albans, and probably built several houses in the city.

The nave is divided from the north and south transepts by a series of arches, six on each side; these, together with the aisle windows, belong to the fifteenth century. The columns of the nave arches are lofty and well-proportioned, while the general effect of the interior of the church is striking and picturesque. From time to time it has been decorated, several items appearing in the churchwardens' accounts for writing up sentences of scripture, setting up the king's arms, decorating and gilding the pulpit, &c. In 1657 there is an item for clock and chimes. Thirteen years later the church was reported by the churchwardens to be in a bad state of repair, the sum of 80*l.* being necessary to restore it. Mr. A. E. Gibbs has recently published some interesting notes on the church, which have been collected from the churchwardens' accounts and vestry orders from the year 1573, and he has kindly placed his original extracts at my disposal. From these I gather that constructional repairs were being carried out in the tower in 1785-86, large sums of money being raised for this purpose.

The work to the tower appears to have been most unsatisfactory. On July 11, 1799, the bells and frame were to be removed, and the tower was to be taken down as far as the tops of the arches, and on October 21 following "the opening caused by this demolition was to be roofed over." All the vestry orders dating between April 1802 and November 1806 have mysteriously disappeared, so that no information can be obtained from this source. From the account of the repairs and alterations to the church given in the "Beauties of England and Wales," we learn that "the close of the scene

was on Saturday morning, November 21, 1801; the whole floor of the belfry fell at once into the body of the church." It is said that the sum of 2,790*l.* was wasted in these repairs. An Act was applied for and passed in 1803, and the Bishop of Ely, to whom the chancel belonged, agreed to its being made smaller. From the above accounts it seems that the tower was partially taken down in 1799, and that the present tower was commenced in November 1802. Clutterbuck says the work was completed in 1806.

It was during these alterations that the chancel was shortened some 30 feet, and the transepts taken down. The material of which the church is built externally varies considerably, the nave being faced with flints, local rubble and local stone dressings. The tower is of brick, and the east front of the chancel, the vestry and the porch, are of stone. With the exception of those portions constructed of stone, the whole of the church has been covered with "rough cast," of which Gough remarks, "The whole outside was plastered over by a London workman (a prevailing fashion of destroying the effect and beauty of our best parish churches), and though done three or four times over, the plaster is now flaking off, both within and without." At the present time the church presents a very dilapidated appearance, and probably was never in greater need of repair. It has been patched with pieces of tile and bricks, and the stone window tracery has been filled in with cement to an alarming extent. The progress of neglect has rarely been more fully exemplified than it is in the church of St. Peter's. However, owing to the generosity of Lord Grimthorpe, the sacred edifice is likely to receive a new lease of life, and all parishioners should be grateful to his lordship for having removed a great responsibility from their shoulders.

It will be seen that the nave of the present church differs little from the south view taken by Baskerville in 1787. It is here represented as having a tower and short spire, the tower having a staircase at the north-east angle, the top of which can just be observed in the sketch. The chancel had a doorway at the west side of the projecting building, which Salmon describes as being a chapel or vestry. In the interior of the chancel, on either side, was a row of carved-oak stalls.

The organ is in a gallery at the west end of the nave. It was the gift of Christopher Pache, M.D., and was opened in 1725-26. In 1731-32 considerable additions were made to the instrument.

GOODRICH CASTLE.

THE origin of Goodrich Castle seems to be involved in some obscurity. Castellum Godrici, its ancient appellation, demonstrates that it owes its foundation to some one of the name of Godric. Grose considers that Godricus Dux, whose name twice occurs as a witness of charters of Canute, was the founder; but this opinion has not always been received, as the monasteries to which those charters have relation were at Hulme, in Norfolk, and St. Edmundsbury, in Suffolk. The incursions, however, by the Welsh into the Marches or English borders had been so successful as to encourage their boldness, and which would afford some reason for the erection of a fortress in this situation. In 1057 Leofric, Earl of Leicester, having died, he was succeeded by his son Algar, who was soon afterwards removed to make room for Ranulph Meschines, Earl of Chester. This being resented by Algar, he entered into a league with Gryffydd ab Cynan, Prince of North Wales, when, uniting their forces, they made a powerful irruption, and ravaged the Marches. They defeated Ranulph within two miles of Hereford, and having destroyed the city, returned to Wales in triumph in the year 1058.

Edward the Confessor raised Harold, second son of the Earl of Kent, to the earldom of Hereford, and sent him in 1059 with considerable force to retaliate the injuries inflicted by the Welsh. Advancing upon their hills, Harold laid everything waste. A law was enacted that every Briton from that time after who should be found with a weapon on this side of the limit he had prescribed, namely, Offa's Dyke, should have his right hand cut off by the officers of the king.

On his return from this expedition Harold rebuilt and fortified the city of Hereford. This, however, did not retard the Welsh from renewing their provocations; for Gryffydd ab Cynan and Algar having retreated into South Wales, the latter engaged Gryffydd ab Llewelyn to espouse his cause. In 1063 Harold again took the field; and, being successful in North Wales, marched in the next year into South Wales, where Gryffydd ab Llewelyn was vanquished and slain. The inhabitants of Wales submitted to pay tribute; and on this occasion a castle was first built to guard the Willow or Wel across the Wye, by some important person, from whom it was called Godric's Castle. It is not mentioned in Domesday, though five individuals named Godric occur as holding lands in other parts of the county of Hereford.

In the Liber Niger Scaccarii, however, we are informed that in the reign of Henry II. William Marshal, Earl of Pem-

broke, held of the abbey of Winchcombe, in Gloucestershire, *inter alia*, sixty-five knights' fees and a half in the honour of Striguil, and two knights' fees with the castle of Goodrich, and on reference to Dugdale we find that, in 811, Kenulph, king of Mercia, amply endowed that abbey, and that from 1054, till after the Norman Conquest, Godric was its abbot. Thus some light is thrown upon the early history of the castle, which also affords a conjecture as to the probability that Godric, the abbot, was the first who erected it.

There appears to be no record extant of the first governors of this fortress, but traditionally it seems to have been held by the Clares, as in 1135 Richard de Clare, Earl of Hereford, is supposed to have held it from the circumstance of having proceeded on a journey from Netherwent into Cardiganshire (Goodrich Castle being situated in the Netherwent or Gwentys-coed), when he was slain on his way in a private feud by Morgan ab Owain, with his son Gilbert de Clare, in 1136.

There is an architectural description of Goodrich Castle in King's "Munimenta Antiqua"; and in the Harl. MS., No. 6,726, fo. 54, sub "Gotheridge," will also be found several interesting notices, compiled by Silas Taylor in 1655, who gives an account of its then appearance. He says:—"About a quarter of a mile or thereabouts from the church is the Castle of Goodrich, a very strong pile, a mighty deep trench being hewn in the maine rock, where it wants the steepnes of the hill w^{ch} it hath upon 2 sides and part of the 3rd. The entrance into it, through a strong gatehouse, is over a little neck of land borne up on both sides with stone work, and is towards the east. It is noe great circuit. It is almost square in figure, having 4 great round towers for its defence at the 4 corners of it. When you are passed the strong gate of the castle, the first thing on your left hand is a chapple, wth the picture of a talbot on the south wall, with the garter of St. George about it, and an earles crownett upon it. It is reported that the keepe of the castle was by way of ransome built by one Macbeth or Macmac, an Irish comander, who with his sonne was taken prisoner by John Earle of Shrewsbury in Ireland, and here imprisoned, and to this day it is called Macbeth's Tower, and to our times were alsoe kept in this castle the memorialls of this atchievement, viz. the two head-pieces of father and sonne, of that vastness and capacity that the one would hold half a bushell of graine; the less was very thicke, and both very ponderous. The lady's tower was battered by Coll. Birch. It is reported by many witnesses that y^e cellars of the castle were floored with Irish earth, for that whenever they brought a toade into them and laide it on y^e earth it would dye, and this they did to preserve their cellars from venome, and it is thought that the very timber came alsoe from Ireland, for there was not either spider or cobwebbe to be seen, but it is reported that in Monmouthshire there is a little spott of land of that nature. The hall was on the west side of the castle, where was observable a beame of oake intire without knott or knarle of 66 feet long, and held 20 inches of 2 feet square the whole length. The hall itself was 60 feet, allowing 3 feet for the beame in the wall."

The keep-tower, which is a Norman structure, is formed of stone from the Forest of Dean, and of excellent masonry. It was called Macbeth's Tower in connection with the tradition above mentioned; but which has been interpreted to relate to the circumstance of Strongbow, who held the castle, capturing Waterford in Ireland, and taking Reginald the Danish chief and O'Falan the Irish king of the Decies, whose lives were spared to strengthen his interest in that country.

To the year 1172, when Strongbow returned from Ireland to propitiate Henry III., we may attribute the period of the commencement of the present keep, the previous structure having been no doubt simply of wood, and perhaps surrounded by a wall. This tower was a place of great strength, and a fit occasional residence for its possessor, partaking of the general character of border castles. John Talbot, first Earl of Shrewsbury, is supposed, in the time of Henry VI., to have inserted two windows in the keep-tower; also two in the chapel, of which till within a few years ago some portions of the tracery remained, though now completely gone. Walter Marshal, Earl of Pembroke, died in the upper chamber of the keep in 1246. William de Valence, Earl of Pembroke (*jure uxoris*), who married his niece, Joan, daughter of Warine de Montchensi and Joan one of the sisters and coheirs of Walter, died in 1296, to whom, from his love of splendour, as well as to his riches, have been ascribed the round towers, curtains, and rooms now in ruins. The style in which they were built corresponds with the age in which William de Valence flourished; but whether those extensive buildings were not in reality erected by his widow, who died seized of the castle in 1307, or by Aylmer de Valence, Earl of Pembroke, their son, there may be some occasion to surmise. An immense moat was excavated from the rock which furnished stones for the purpose, and contributed to construct such a fortress with every contrivance to render it impregnable in the then system of warfare, the remains of which exist at this time in a sufficient degree to attest its former strength and magnificence.

The possession of the castle ultimately came to the Talbots,

Earls of Shrewsbury. Sir Richard Talbot, Lord Talbot, having married Elizabeth, the daughter of John Comyn, one of the competitors for the crown of Scotland, and Joan, his wife, sister and co-heir of Aylmer de Valence, became the possessor of Goodrich Castle, *jure uxoris*; and though he does not appear to have repaired the castle, he did much towards the embellishment of Goodrich Church, and obtained from Edward III. the grant of a prison in Goodrich Castle for the punishment of malefactors.

In 15 Ric. II., Richard Lord Talbot, grandson of Sir Richard Talbot just mentioned, was found to be one of the cousins and heirs to John, the son of John de Hastings, Earl of Pembroke, viz. the son of Sir Gilbert Talbot, K.G., son of Elizabeth, daughter of Joan, one of the sisters and heirs of Aylmer de Valence, Earl of Pembroke, and therefore succeeded to his possessions.

We are now arrived at the period when the sculptures on the walls are supposed to have been made, probably by some unhappy persons who were imprisoned in the south-east tower of this fortress in the latter part of the fourteenth century. These sculptures are made in the stone walls of the apartment in the first floor of the tower, on the sides of the east and west windows, the figures composing them being formed by cutting away the surrounding stone, and leaving them as in a sort of alto-relievo.

The first, cut upon the south side of the west window, reads thus, MASTR SUM ADAM HASTYNS. It is accompanied by a figure of a man, apparently crowned, with a divided beard; and, according to the opinion of Sir Samuel Meyrick, in the costume of the time of Richard II. He is holding a hawk on his hand, and below him is a dog.

The remaining sculptures are in the east window. One represents a similar figure of a man to that just described, in the same costume, with a divided beard, and wearing a coronet distinctly composed of what are termed in modern heraldry strawberry leaves. He holds a hawk upon his hand. This figure is not so high in relief as the others, and is little more than an outline. The remaining figures consist of the Virgin (crowned) and child; a stag couchant and swan; a hawk, belled, pouncing on a bird; a hare and rabbit; and a bird, apparently a pheasant.

The figures of the animals are evidently drawn by a hand not unacquainted with the nature of animals, as upon inspection they will be found to possess some good drawing, considering the period of their execution. It has been suggested that the stag and the swan represent the badges of Richard II. and Henry IV. respectively; but there does not seem to be sufficient evidence of this, or that it was the intention of the artist that they should be considered so, because all the animals above enumerated are associated with the wild sports of the day.

Goodrich Castle remained in the Talbot family till towards the end of the reign of Queen Elizabeth, when George, sixth Earl of Shrewsbury, marrying Elizabeth, the daughter and heir of John Hardwick, of Hardwick, in the county of Derby (and widow successively of Robert Barlow, of Barlow, in that county Sir William Cavendish, Treasurer of the Chamber to Henry VIII., and of William St. Lo, knight, Captain of the Guard to Queen Elizabeth), obtained a license to alienate the castle of Goodrich, and other estates, in favour of her son, Henry Cavendish, who married Grace, a daughter of the earl by his former wife.

George, sixth Earl of Shrewsbury, was succeeded in 1590 by his son Gilbert, the seventh earl. Gilbert married Mary, daughter of the before-mentioned Sir William Cavendish, and Elizabeth, afterwards Countess of Shrewsbury, but died in 1616, leaving three daughters his co-heirs, of whom Elizabeth became the wife of Henry Grey, Earl of Kent, to whom she brought the Goodrich Castle estate. This lady survived her husband, who died without issue in 1639, and retained possession of the castle during her life.

It was during the period of the Countess of Kent's possession that this ancient fabric at length fell from its former and wonted magnificence in the disastrous civil wars of the seventeenth century, having sustained a siege by the Parliamentarians in 1646, when, after a stout resistance, it surrendered to Colonel Birch on July 31 in that year. In the March following the Parliament ordered it to be demolished; and, as far as its former capacity for defence was concerned, the order of Parliament was effectually executed. The Countess of Kent did not long survive the destruction of her property. She died in 1651.

In her will dated June 20, 1649, she confirms a settlement of her estates which she had made in the previous year, and by which she had conveyed the Goodrich property to her own use for life, with remainder to the heirs of her body, ultimate remainder being to such persons who were named in the settlement. On her decease it devolved upon Anthony Grey, eleventh Earl of Kent, who was lineally descended from George Grey, second Earl of Kent, the great-great-grandfather of her husband.

Anthony, Earl of Kent, died in 1702, and was then suc-

ceeded by his son, Henry, the twelfth earl, who was created Marquess of Kent, Earl of Harold and Viscount Goodrich, and subsequently Duke of Kent. He was sometime Lord Chamberlain to Queen Anne, by whom these honours were conferred. On his death, without issue male, in 1740, his estates, pursuant to an Act of Parliament passed in 1725, were sold. Goodrich Castle was purchased by Admiral Griffin.

THE DERBY COLLECTION OF MINERALS.

ACCORDING to Mr. Bryce Wright, who formed the collections (now left to the Liverpool Museum) in their entirety for the late Earl of Derby, during a period of twenty years, the minerals are of much interest. The antiquities are already in the possession of the Liverpool authorities, they having been presented to the city in 1890. The collection of minerals represents principally one great division of mineralogy, that of silica, in its varied forms of quartz, rock, crystal, agate, chalcedony, jasper, &c., with a series of earthy and metalliferous minerals, such as labradorites, precious opals, malachites, rhodonites, &c., used for economic and decorative purposes. Few, indeed, have been the collectors of cut and polished agates during the last half century, but it is interesting to note that the collectors of such specimens have all been eminently men of the highest culture and attainments. To the ordinary mind one agate is the same as another—a centre generally of black, brown or white silica, surrounded by concentric parallel zones of chalcedony—but to the serious collector or connoisseur the deposition of each stratum tells a distinct tale of nature's work, whilst the thinning or thickening of the strata or the intrusion of a foreign substance gives rise to serious hypotheses. The agates brought from India by Dr. Birdwood were perhaps the first series during the last fifty years to attract particular attention. Then followed the commencement of the great collection by Professor John Ruskin, simultaneously with a very fine series made by the great omnivorous collector, Mr. Alfred Morrison, whose generous and liberal mode of collecting at the time gave a great impetus to the searching for such specimens in Europe. Professor Ruskin's papers and articles in the *Geological Magazine* and elsewhere upon the formation of agates, some fifteen or twenty years before his catalogue of specimens of "native silica" and arrangement of the series of specimens now in the British Museum, started a few earnest collectors, one the late Mr. Arthur Wells, of Nottingham, better known as the great collector of jade, who formed a small but extremely fine series with great care. The writings of Professor Ruskin were perhaps also the cause of the commencement of Lord Derby's collection, which for beauty, rarity and size may fairly claim to be at the present day unsurpassed. Purchasing single specimens at first for their beauty, these accumulated so rapidly that a cabinet was decided upon to hold them; then the collecting began in earnest, and for the last twelve years not a single specimen of sufficient merit has appeared in London which has not found a place in the cabinet. Any specimen which particularly struck Lord Derby was procured if possible in duplicate, so that there are four, five and even more sections of many important examples in the collection. Thus there are no less than four rectangular slabs of transparent green moss agates, measuring 13 inches by 8 inches each, and half an inch thick, as well as dozens of others of different sizes and shapes. The onyx-agates, chalcedonies and fortification agates can be counted by the hundred, whilst the same may be said of the jaspers, which are seen in every conceivable colour and shape, from the beautiful striped or ribbon jaspers—the deep green and crimson spotted heliotrope of India—to the brown conoidic forms of the Egyptian pebbles. The deep and bright browns and reds from Siberia, Germany, Scotland and many parts of South America are all plentifully represented, beautifully cut, mostly polished on both sides. Dozens of specimens of sard, sardonyx, cornelians, plasma, prase, &c., are met with, all exhibiting their individual characteristics of deposition, formation and colour. Circular agates formed by fine concentric strata of chalcedony and onyx surrounded by translucent crypto-crystalline silica or quartz, often with an opaline tinge, Lord Derby was specially anxious to procure, so that a large series of these, the most beautiful perhaps of all sections, are in the collection. One slab (a duplicate of which is in Professor Ruskin's collection) is perfection. A distinct circle about 3 inches in diameter, composed of extremely minute grey, blue and white concentric strata, is surrounded by a border of transparent filiform and crypto-crystalline silica, in which the rhombohedral form with planes of the apices of the crystals are distinctly discernible. Silicified corals, many of them evidently changed from carbonate of lime, but still distinctly retaining their primitive structure and exhibiting the septæ, are well represented, as are also the milk and blue-white Mocha stones, with their lovely dendritic markings of manganese and other metallic substances, so tree-like in appearance that one can be

forgiven for thinking they are of vegetable origin. One section of an abnormal agate must not be forgotten; it is a long oval specimen, measuring $1\frac{1}{2}$ inches by $\frac{7}{8}$ inches wide, of beautiful amorphous silica and agate, but only the eighth of an inch in thickness. Polished beautifully on both sides, it is quite transparent, but every minute stratum or zone, although some are only the many thousandth part of an inch in thickness, can be clearly defined.

As recently as the commencement of this year Lord Derby added to the collection a series of most beautiful transparent polished specimens of rock crystals enclosing acicular crystals of rutile, the oxide of titanium, the "Flèches d'Amour" or "Love's darts" of the French, also called "Venus Hair." One specimen is quite unique, large bunches of resplendent golden needle-like crystals crossing indiscriminately under the pellucid quartz. Passing from the silicas, which form the principal part of the collection, there is a large series of slabs of other important minerals, both earthy and metalliferous. In the former may be mentioned lovely chatoyant labradorites, brilliant in every conceivable prismatic hue; microclines, blazing in their metallic blue moonlight tints; lumachelle or fire marbles, glistening in their shelly matrix; aventurines (green and red), sparkling brilliantly; sections of lovely transparent fluor spars, in such exquisite tints of purple, blue, red and orange as to defy description; precious opal slabs, gleaming with their myriad harlequin reflections of every colour; as well as thulites, dichroites and many species and varieties too numerous to mention here. Of the metallic specimens, there are beautiful examples of the emerald green carbonate of copper malachite, showing its botryoidal and reniform structure as well as its aqueous formation; rhodonite, the rose-red manganese; chrysocolla, the silicate of copper associated with azurite, the blue carbonate, and many other metallic rarities. A small series of interesting and very valuable meteors, representing the three classes—siderites, litholites and lithosiderites—must not be omitted, as well as a drawer consisting of balls cut from agates, jaspers, thulites and other minerals, one being cut from a large star carbuncle showing clearly the asteroid of four lines. The whole cabinet contains seven hundred specimens, and the Liverpool Museum can fairly claim to be in the possession of the finest collection of its kind in existence. It is pre-eminently a collection of beautiful specimens, and when they are properly and scientifically arranged, as they doubtless will be, attention being paid to the disposition of light—many specimens requiring the transmission of light through them—they will present a spectacle that cannot fail to arrest the attention of even the most unobservant; whilst the student will learn once again through a new channel of the marvellous and glorious beauty revealed through nature. Although Lord Derby always disclaimed any scientific knowledge of the specimens forming his collection, he was quite *au fait* with the writings of Professor John Ruskin and Professor F. W. Rudler, of the Museum of Practical Geology, as well as of the theories and hypotheses advanced upon the formation of agates by Professor Heddle, Herren G. Lange and Bischoff, as well as Professor V. Ball and others.

ARCHITECTURAL ASSOCIATION STUDENTS' SMOKING CONCERT.

THE annual smoking concert of the Architectural Association students was held at the Mona Hotel, Covent Garden, on Monday evening last, when the president, Mr. H. O. Creswell, presided. There was a large muster of members present, and the Chairman was supported by Messrs. Goldsmith, Farrow, Baggallay, Earle, Elsey-Smith, Lewis, Max Clarke and Cole Adams. Messrs. E. Graham Simpson, S. B. Lee and E. O. Cummins efficiently discharged the secretarial duties.



The Future of Architecture.

SIR,—I have twice recently almost suffered an attack of syncope on reading the architectural matter in my daily paper. Amidst much laughter in the course of a discussion in the House of Commons on May 5, on the vote of 11,200*l.* for the Admiralty buildings, the Secretary of State said that the architecture of the design first proposed was in "the debased provincial municipal buildings style; but that the Select Committee came to the conclusion that a far better style of architecture would be found in the existing Admiralty buildings, the architect of which (Sir Christopher Wren) was content with simplicity and proportion. He was afraid that every public building was more inconvenient than its predecessor, for the

Foreign Office block had been surpassed by the Royal Courts of Justice of Mr. Street." Yet, sir, this last architect is buried in Westminster Abbey, and, like the former, has his monument in a conspicuous place on his last and most important work. It is strange that on a subject involving as much science as taste there should be such diversity of opinion. Then I read that at a conference in Liverpool recently Mr. Arthur Cates, a very active member of the Council of the Royal Institute of British Architects, London, obtained the support of about a dozen delegates and local architects to the following proposition, viz., "For dividing the United Kingdom into architectural provinces or districts, of which the societies now or hereafter to be allied to the Royal Institute would be the respective centres, one object being . . . the promotion, amongst other things, of architectural education." This looks rather like architecture in bonds and tears. As an old practitioner fairly well satisfied with his past success, I wish every possible advantage may accrue to my brethren from this movement, though from the standpoint of the past it is a most extraordinary one, and though I doubt whether the principles of the martinet and the action of the drill-sergeant will succeed in conferring the present much-needed vitality on British national architecture, which is the object in view. Perhaps if the R.I.B.A. appoints a popular architectural lecturer in each province improvement may ensue in time. But I fear that the members of the Council of the Institute think more of personal advantage and the promotion of selfish interests than of the vitality or improvement of architecture. The R.I.B.A. is emphatically for architects first, and only secondly, if it may be, for architecture, the first of arts. If this be true, the sooner we have a college of architecture the better; the present club would doubtless still have sufficient *raison d'être* for continued existence. You allowed me to say a few words in favour of this theory in your issue of June 22, 1888. The reply, as far as I could gather, was that the R.I.B.A. was already a college, a claim I must deny emphatically, for I think it is just the characteristic wanting in the Charter of the Institute, which does not represent the large majority of architects. I conclude with the following words from that communication:—"Professors, critics and men actually engaged in the art confess and urge that it is in an unsatisfactory position at the present day. Mr. Herbert Spencer tells us that of all the arts architecture is the only one that has not been far surpassed by the moderns, except only statuary, and that as architects persist in copying the work of other men and other times society has no respect for their productions, and they consequently do not take rank as they would do if their art could be placed upon a better footing." Here then, surely, is a business worthy of our most distinguished and eminent men, in or outside the R.I.B.A., and accepting the above words as undeniably sound in argument, it should be undertaken without delay. HERMES.

GENERAL.

A Number of Students from the plumbing classes connected with the Goldsmiths' Institute and the Croydon Polytechnic visited the Museum of Sanitary Appliances at Highgate on Saturday last, the 13th inst. They were met by Mr. Thomas de Courcy Meade, M.Inst.C.E., the engineer and surveyor to the Hornsey Local Board, and Mr. Taylor, R.P., one of the gentlemen engaged in giving lectures on plumbing at the Museum, in connection with the Technical Education Committee of the Middlesex County Council. After spending some three hours there in examining the exhibits the students left, expressing their appreciation of the completeness of the Museum and the excellence of the exhibits.

The Architectural Association Lyric Club Committee announce that the last concert of the fifth session will be held at the Freemasons' Tavern on Monday, the 29th inst., at 7.30. The nomination of officers for the ensuing season will also take place.

Mr. Percy E. Newberry has brought back from Upper Egypt several drawings of ancient tombs in the province of Minieh and Assiout, which were prepared by Messrs. Percy Buckman, J. E. Newbury and Howard Carter, in connection with the archaeological survey of Upper Egypt. Next month there will be an exhibition of the drawings.

The New Church at Turner's Hill, Sussex, for which Mr. Lacy W. Ridge's plans have been selected, will shortly be commenced. The nave and aisle will cost 2,300*l.*; chancel, organ chamber and vestries, 1,200*l.*; tower and porches, 2,000*l.*

Bishop's Court, the residence of the Bishop of Sodor and Man, was partly destroyed by fire on Monday. The valuable documents belonging to the see were consumed, but the pictures were saved.

The Exhibition of the Royal Scottish Academy, which was opened in February, closed on Saturday, the 13th inst., after a successful season, the attendance having, it is stated, exceeded that of any previous year.

The Architect.

THE WEEK.

THE magistrate at Greenwich has given a decision which it is to be hoped will be taken as a precedent. The case was not altogether novel. It was a maxim of ADAM SMITH that "the tax which each individual is bound to pay ought to be certain, and not arbitrary." But of late years local and other authorities prefer to imitate the Scottish lairds, who impose a fine on every tourist who lands from a steamer, although his stay on land may be counted by minutes. Consequently, Messrs. PEARSON & SON, who are making the Blackwall Tunnel, were probably not surprised when rates were demanded from them for having set up plant on the Greenwich marshes. Every contractor of standing has had experience of demands which, practically, are of the same character. It was claimed that Messrs. PEARSON used the ground beneficially and therefore were bound to pay. Everybody who passes through Greenwich, or who stays for a night in one of the hotels, could also be said to enjoy a beneficial occupation, and there are places where the briefest enjoyment of residence involves liability to taxation. But that is not the English practice, although many people would desire to see so annoying an incidence in operation. One reason for exemption is that taxes cannot be levied in equitable proportion on permanent and temporary occupiers of ground and houses. If the latter are allowed to be exempt, some of the former, who may be absent and enjoy few advantages from authority, have to pay, so that ultimately a fair balance is struck. Again, builders and contractors rarely work on land that is their property, and if the owners are assessed, as they should be, why are the contractors expected to pay in addition? Looked at in a broad way, such applications as that to Messrs. PEARSON & SON are unfair. But the magistrate considered the question was worth consideration, for he reserved his decision. It was given on Tuesday, and of course was in favour of Messrs. PEARSON; but there was still some uncertainty in Mr. KENNEDY's mind, for he declined to give them costs, and offered to grant a case to the applicants for taxes. If Messrs. PEARSON are not liable, we see no reason why, because they are contractors, and are entrusted with a perilous undertaking, they should have to go through the ordeal of a police-court inquiry at their own expense. The money may be a trifle, but the principle at stake is important, and affects all builders and contractors in this country, for they should not be exposed to litigation which can be set in motion with impunity.

THE working plans for the drainage of Chichester have been completed by Mr. BALDWIN LATHAM. The estimate for the works within the old city boundary and outfall works is 24,400*l*. It is proposed to extend the city, and to provide for the new parts a further outlay of 6,350*l*. will be needed. Originally it was proposed to convey the sewage to New Fishbourne and, after treatment, to discharge the effluent into Chichester Harbour. Owing to the opposition of the fishermen it is found necessary to adopt another site, but it will be a very much more difficult and expensive matter to get the sewage there than it would have been upon the site originally selected. In order to properly command the new site with advantage, it will be necessary to put in iron sewers along a part of a public road. Mr. BALDWIN LATHAM proposes that the sewage, after treatment within the buildings proposed to be erected, will be allowed to subside, and the clarified effluent will then pass over an area of land laid out specially for the purpose. This effluent will be retained in a tidal storage tank, and discharged into the Chichester Harbour only in the first period of the ebb-tide. The effluent produced by the proposed sewage treatment will be as good as is usually secured in any inland district, draining into a fresh-water stream, the water from which may afterwards be used for the purpose of a public water-supply. There is no provision in the estimates for house connections. The engineer says that as a rule the cost of house connections, including the branch drain to a house with an intercepting

trap and proper cover for examination at the street kerb, would cost about 45*s*. each. It is for the Corporation to determine whether or not this work should be carried out at the time of the sewerage undertaking. This has been done so in a large number of instances in recent times, and the money sanctioned by the Local Government Board for this expenditure has been borrowed and paid off with the rest of the loans incurred. The arrangement has one great advantage, as it will very considerably relieve small owners of property from incurring heavy expenses in having to make house connections with the public sewer in the road, whereas, on the other hand, there may be a certain number of owners of property in Chichester who at present drain to the sewers, and under the Public Health Act of 1875 they may require the Sanitary Authority to make the house-drains for them at public cost. It will be necessary to have another inquiry before the sanction of the Local Government Board for borrowing the money can be obtained. Once more the whole subject will have to be discussed, and the opposition which hitherto has acted with a contentiousness that is without precedent can again show its strength. There can be no doubt, however, that the sanitary state of Chichester is discreditable to the ecclesiastical as well as the lay authorities.

THE proposal to found a library and museum in Horsham as a memorial of the poet SHELLEY, who was born at Field Place in 1792, does not appear to have much chance of realisation. The whole of the subscriptions do not amount to 300*l*. Much was expected from America, where the poet's works receive more appreciation than in England, but the committee have received only 72*l*. from the United States. The secretary says: "The money at the disposal of the committee is wholly inadequate to meet the expenses of founding and endowing a Shelley Library and Museum at Horsham. It has been suggested that in lieu of the library, the money actually received, where no objection is raised by subscribers, should be applied to the purpose of founding and endowing an annual prize for English literature at the Horsham Grammar School. To this the American subscribers have agreed. As, however, the original scheme was approved almost unanimously, it is only fair that wide publicity should be given to the actual state of the case; especially as even now there may be some who, rather than permit the larger project to lapse for the want of money, will be ready to come forward with the necessary funds." The reason for the indifference no doubt arises from the conviction that a library and museum cannot be of much use in Horsham, where so little has been done by the inhabitants to express their sense of the honour which comes from having a townsman like SHELLEY. If they were eager to see a memorial of the poet among them, they would have no difficulty in raising the money to pay for it.

IT sounds strange to have the name of ROBERT BURNS connected with a law-suit, but one has arisen over a statue of the poet. He does not stand in need of that sort of immortalising, but somehow his admirers consider there cannot be too many statues of the poet, and in consequence some of the strangest figures have been created as representations of the sturdy ploughman. In Providence, Rhode Island, a BURNS Monument Association was founded. A commission for a statue, which was to cost 15,000*dols*., was given to Mr. NOBLE, a sculptor, who lives in Boston. After a time he was informed that the project was abandoned. Mr. NOBLE claimed 6,800*dols*. for the work done by him, and as he could not obtain it he was compelled to bring an action to recover his money in the American Courts. The defendants relied on a variety of pleas. First, they tried to make out they did not belong to the BURNS Monument Association; secondly, it was argued if they were members it was arranged between them and the sculptor that the commission was to be valid only when sufficient money was subscribed; thirdly, that the 15,000*dols*. were not collected; and fourthly, that all the money which came in was handed over to the sculptor in return for his risk. The Courts took a simple view of the affair, and judgment was given in favour of the sculptor.

THE AMPHITHEATRE AT ARLES.

AN Englishman who wishes to see a Roman amphitheatre will of course prefer a journey to Rome rather than to Arles or Nîmes. The Colosseum is in length and breadth nearly one-half greater than the French examples, and it undoubtedly has more historic interest. It is well, however, to remember how vast was the difference between Rome and a sort of colonial capital. What seems surprising is that Arles, although it was the Gallic Rome, was able to obtain authority and aid to erect buildings so important as the amphitheatre and the theatre. Their size and character denote the value which statesmen ascribed to spectacles as an aid to government by supplying one of the necessities of life, *panem et Circenses*, for Romans. The belief in their efficacy still prevails in France. It is not only in Arles and Nîmes that remains of amphitheatres are found. They existed also in Bordeaux, Saintes, Poitiers, Senlis, Béziers and Fréjus. Nor was the predecessor of Paris without its arena.

At Arles the site was selected with judgment. Although the building has been freed from the houses which, like parasites, were attached to it (they were made up of its materials), yet as it is surrounded by streets, a visitor does not realise that the ground on which it stands is the highest in the neighbourhood. In fact, the slope of the site made it necessary to employ an immense mass of masonry in the substructure.

We suppose it can never be determined when the amphitheatre was constructed. It is probably as well the date should be unknown, for if a record relating to the work were discovered, there would be an end to the controversy among the archæologists of the South of France about the relative ages of the amphitheatres of Arles and Nîmes. Priority is claimed for Arles on account of a supposed refinement in the detail, which is said to indicate a period when Greek influence had not vanished. The less complete hydraulic arrangements are accepted as further proof of age. On the other side, it is contended that the superiority of the treatment which is visible in the arching, as in other parts of Arles, is evidence that the builders were novices when they erected the amphitheatre at Nîmes, and accordingly they were able to give the benefit of their experience to the work at Arles. In both places, any pride there may be in the quality of the masonry would be sacrificed if by doing so some assurance of greater age could be given. The amphitheatre of Arles may date from the beginning of the second century, but there is no historic evidence of its existence prior to the fourth century, for about A.D. 335 it is recorded that spectacles were held in it. The later emperors were disposed to keep the people in good humour, and during their brief reigns the arena of Arles was probably not allowed to be unoccupied. The early Frankish kings followed their example, but it is to be hoped without sacrificing the lives of human beings. The remembrance of those sacrifices was enough to compel Christians to have an enduring aversion towards the theatres in which they were enacted. The amphitheatre of Arles was doomed to ruin. The quantity and strength of the masonry were not easily overcome. Before the building was demolished Arles was threatened with an invasion of Saracens, and the people were glad to utilise the ruins and convert them into a citadel. When the danger was at an end the amphitheatre was again treated as a quarry. Fortunately Arles was a place of slow growth, and the stones were not required except for ordinary buildings. There were no palaces like the Palazzo di Venezia, the Palazzo Farnese, the Palazzo Barberini and the Cancelleria Vecchia, which were built with the stones taken out of the great Roman amphitheatre. During centuries the ruins were pillaged for mean hovels or neglected until the Renaissance gave interest to all relics of Roman greatness. The place was visited by FRANCIS I., who lamented the degradation he witnessed. HENRY IV. took a more practical view, for he ordered some of the buildings that were erected on the arena to be removed. At his death there was only a partial clearance, and then followed a fresh period of neglect. In the beginning of the present century, when Frenchmen were esteeming themselves as the heirs of the ancient Romans, interest was once more renewed in the amphitheatre, and the colossal work of clearing the ruins from rubbish was commenced. But

the squatters were less easily removed. There were over two hundred houses within the amphitheatre, and the occupants could not be evicted without compensation. It was considered to be a victory that at the beginning of 1830 one hundred and eighty were already demolished, at an outlay of 3,000*l*. The remaining thirty-one houses cost no less than 24,000*l*. Altogether more than 7,000*l* had been expended before M. QUESTEL was asked to report on the works that were requisite for the conservation of the amphitheatre.

It is evident that the elliptical plan of the Colosseum in Rome was taken as a model in the provinces of the empire, but the ratios of the axes differ slightly. In Rome the major axis of the ellipse, measured to the exterior, is 616 feet, and the minor is 511 feet, or 1 : 1.20. In Arles the axes are 446 feet and 353 feet, or 1 : 1.26; while in Nîmes the axes are 433 feet and 332 feet, or 1 : 1.30. The arenas of Arles and Nîmes are almost identical in size. The former measures 227 feet by 130 feet; the latter, 227 feet by 127 feet—a correspondence that cannot be accidental. As the ratio of the inner ellipse was about 1 : 1.8, the occupants of the lower seats possessed not only a closer view of the scenes in the arena, but they were able to see easily across "the house," and to recognise acquaintances in opposite tiers. Owing to the corridors being of uniform width the ratios between the axes were altered, and accordingly the upper tiers of seats were not only farther from the arena than those below, which was unavoidable, but as the ellipse gradually approached the circle (since the minor axis was increased in length at a rate that was impossible with the major axis) the occupants, in proportion to their inferiority, were kept more apart. The elliptical plan was probably adopted in order to suit the convenience of the most important people in a Roman city. If the seats were arranged on a circular plan (assuming the length of the arena to be the same) there would be fewer chances for the occupants of the *podium*, or row of boxes, to exercise themselves in the language of the eyes.

There were discoveries at Arles which enable us to realise some of the arrangements of the podium. That part of the amphitheatre was faced with marble, and was divided so as to form a series of boxes, which were assigned to officials, corporations, and other people of importance. At Arles the divisions of the podium did not rise from the ground, but rested on a sort of cornice which was carried by walls. It is supposed that a sort of wooden gallery was built in front of the podium, which could be used as a refuge by the *bestiaires* if they were pursued too closely by the wild animals. In the modern circus the performers, when they wish to suggest they are in danger from a trained mule or other quadruped, vault among the audience, but Roman senators and commanders would not be so tolerant of the presence of men who fled instead of combating. The gallery could also be safely used by the *grandees* when they goaded the animals on leaving the cages. That combats with lions, tigers and panthers were more common in the amphitheatre of Arles than at Nîmes is evident from the height of the podium we have described, which no wild animal could bound over, as well as from the remains of the animals which have been found in the subterranean chambers. Two inscriptions are also to be seen in the Musée of Arles, which relate to contests of gladiators and *bestiaires* that were provided at the cost of two of the *grandees* of the colony.

The exterior of the amphitheatre of Arles presents two storeys or series of arcades, the lower being Roman Doric and the upper Corinthian. It is assumed there was also a very low attic on which the blocks used for supporting the *velarium* were built, but there is no trace of the arrangement, Arles in that respect being less fortunate than Nîmes. It is still possible to appreciate the arrangement of the plan, which was so simple that few of the 25,000 spectators were likely to be puzzled in reaching their prescribed places. The principal entrances were at the ends of the major axis, and from them a gallery led direct to the podium, which contained four rows of benches. There were three other divisions, each having eleven rows of benches, which communicated with corridors and staircases leading to the external arcades. The subterranean part had also its passages to and from the outside world. There is some cylindrical vaulting in one of the galleries, but on

the whole the construction imposed no great difficulties on the masons. The massiveness of so many of the stones is characteristic.

It is remarkable that the theatre of Arles, of which only enough remains to suggest the splendour of the building, is supposed to owe its ruin to the portability of the stones which were employed in it. Built of stones as large as those seen in the theatre at Orange, it was likely to have as well withstood the wear and tear of ages. We have cause, therefore, to be grateful to the builders of the amphitheatre who insisted on using such a quantity of large stones in the amphitheatre, although it was necessary to convey them from a quarry that by the route taken was twenty miles distant.

ARCHITECTURAL ASSOCIATION SOIREE.

Production of a new and original Medley, in a Prologue and Two Acts, by Theo. Moore and Ernest Rüntz. Played for the first (and last) time at the Westminster Town Hall on Wednesday, May 17, 1893.

"MYTHOLOGY RUN MAD; OR, LES CHUMPS DE MARS."

[BY A CORRESPONDENT.]

EUREKA! Mr. Editor—Eureka!! "The place where good architects go." The planet Mars! No need any longer of vain speculations as to signals and flash-lights for communication with that blissful sphere. The Architectural Association have organised one of their inimitable excursions into the land of the great departed, and by the help of Messrs. Theo. Moore, Ernest Rüntz, and other Searleswood imitators we were presented with a slight idea of what the excursion might be if we ventured ourselves by the Lightning Streak Railway, at the reduced rates which the Hon. Sec. has managed to arrange. Hitherto the attractions of the A.A. excursions have been set forth by magic-lantern diagrams, but now they are modelled in the solid.

PROLOGUE.

(Air.—"Once more I sent the needful eighteen stamps.")

I.

MERCURY. Whenever I purchased the *Builder* I scanned the advertisements well

To see if assistance was wanted by some architectural swell;
For one quid a week and my washing in his office when left all alone,
I'd turn out a fine set of drawings you bet, which he'd promptly annex as his own.

Such things on earth I find are still the same,
Assistants oft-times make the master's name,
For overtime they are not paid a sou,
I'm blest if I'd put up with this, so take my tip—don't you.

II.

Well, I passed as a district surveyor, fixed screws were unknown in those days,

And then I gave lectures, wrote booklets, for the use of professional J's;
Through the ranks I a colonel became, and later an M.P. was made,
A professor you see, tho' without a degree, I'm a hot 'un at pushing my trade.

Once more I've spouted at the Joiners' Hall,
Once more defined a legal party wall,
Once more idealised ancient lights,
With pride I swell, as you can tell, at arbitration fights.

First, of course, we were shown the starting-point on this side, a Railway Terminus, designed by the Soane Medallist, and, as the greatest attraction to the A. A. man, the bar was to the front. Mercury, acting as barmaid to the passengers, after their departure announces his mission thus:—

Well, this is strange; I seem to know the place,
And yet I'm straight from Mars, by special grace
Of Jupiter—a tedious old bounder.
For him I seek a wife, and when I've found her,
To Mars above I will be her purveyor.
When in the flesh I was district surveyor—
What R.A.'s call an architect's policeman!
Of course, I took a fee on this.

Cupid then appears, entrusted with the mission "to find a mash for Mother Venus." The "mash" appears in the person of Colonel Jonathan Gin Cocktail, of Chicago, who has "come from the World's Fair to buy the Tower of London and St. Paul's Cathedral (bar the reredos, which should be Bod(i)ley-Garnered to its long home in the Aquarium)," also "Haddon Hall and Hatfield and Blenheim, where the battle was fought." Jonathan is induced to go to Mars by the prospect of buying up the planet for the Chicago Show, Mercury selling him the ticket, as he "bought them up in Mars, and pretty cheap"—

Because the owners never will return
A batch of builders. Man, how they will burn!

Then enters Mrs. Moriarty, of Dublin, mother to Venus, together with her nephew, Leonard Aloysius, a poetic craftsman. Leonard Aloysius had started with the idea of taking his aunt and his sister Josephine on an A.A. excursion to Italy, but repents thus:—

Why ever was I fool enough to take these two impossible women with me? All the way to Italy, too. I'm mad! (*To CUPID, acting as porter*) Is this the platform for the A.A. excursion to Earlswood? I mean, is this (S) Earlswood Station for Italy?

CUP. Searle's Wood! He'll be here directly. He's at an R.I.B.A. examination, helping on the nervous A.A. men. (*Applause.*)

Then Leonard sings (Air—"The Man that Broke the Bank at Monte Carlo") :—

I.

To Italy's fair sunny climes some members fain would fly,
With Searle's Wood and Company, just to wink the other eye
At architectural marvels and brunettes so sleek and spry,
And an ice cream to satisfy the inward man,
Varied by some macaroni and some jam.

Chorus.

And as they walk along with this mixture so strong,
Concealed somewhere there (*under waistcoat*),
You will hear the girls declare
They have had a bad nightmare.
You will hear them sigh and wish to die,
As they blink and wink their bilious eye,
In a way suggesting "Wells" of Monte Carlo.

II.

I've heard the A.A. meetings are not patronised of late,
Well, they're not quite up to date, and I've heard our friend Stokes state,

He would like to suck his pipe and take a pint whilst on debate,
And I think 'twould suit the members very well,
Judging by the bad tobacco I can smell.

Chorus.

Thus they'd jog along and the meeting prolong
Until morning's chilly air,
But little would they care,
So long as the booze was there,
And the papers they'd try, in the sweet bye-and-bye,
To discuss with a song and a sleepy eye,
To the tune of "Twiggy Vous" or "Monte Carlo."

Josephine then enters with a box, soliciting "a mite to our headquarters," and after colloquy, chiefly oburgative on the part of Erin's daughters, between Mrs. Moriarty and Leonard Aloysius, sings a duet with Mercury which runs thus:—

Duet—MERCURY and JOSEPHINE.

(Air, "I'm in love with the Man in the Moon.")

I.

MERC. May I ask, miss, if you have a lover?

JOS. I'll refer you at once to my mother.

MERC. For I've plenty to furnish a trip to the stars,
(*Aside*) (In the wrong train I'll put her, it's just off to Mars,

The old lady I'll lose, for her accent it jars.)

JOS. (*To Jos.*) And your name you shall change pretty soon.
You're rather too previous, for I'm not yet game,
To take you—unknown—as my regular flame.
I must ask you to furnish me, sir, with your name,
For you might be the Man in the Moon.

Chorus.

Yes, he might be the Man in the Moon,
But we'll find out the truth very soon.
His manner is light, and there's something not right
In his conduct suggesting a heavenward flight.
On this evening of May—to the tune
Of in love with the Man in the Moon.
And she's (*points to Jos.*) falling in love with this man from above.
You would think she'd prefer a dragoon—
Yes, a handsome and dashing dragoon.

II.

MERC. Well, a soldier I'd be for your pleasure.

JOS. I'll inform you my wishes at leisure.

MERC. Architectural policeman I've been all my days,
I delight in enforcing the Building Acts' ways,
And to spoil a fine building is my special craze,
But I always find time for a spoon.

JOS. Prompt payment of fees is a very good plan.
If you stick to this course, I may have you, young man,
Though for Art and Art culture you don't care a (*drum*),
Any more than the Man in the Moon.

Chorus.

Oh! we knew she'd discover it soon—
He's a policeman and not a dragoon.
So of course it's all right, though his manner be light
His professions are proper, his language most trite.
When on Italy's famous lagoon
As our courier he'll prove a boon.
With such brilliance and wit, why he's not the least bit
Like a man that resides in the moon—
Such a man cannot come from the moon.

Leonard Aloysius, having missed the train to Italy, decides to go to Mars to see the Acropolis. Mrs. Moriarty is attracted by the chance of seeing her daughter Venus, and—

The blayguard who killed me darlin' Pat. Ah! Mr. Mercury, he was an Architect, but he was always studyin' a book they call "Gwilt," an' it kilt him intirely.

MERC. Gwilt! Why there's a man of that name upstairs. (Aside) Won't there be ructions!

Josephine also is ready to go, as she says in her song—

(Air—"Oh! Mr. Porter.")

JOSEPHINE.

Lately I just spent a week of play and Ta'rara booms,
Went to a dance with A.A. men at the Portman Rooms.
Just a time I had of it, and once came a cropper,
The Lyric boys all turned their heads and murmured how improper.

Leaving half a waltz undanced I started for the station,
My mash saw me to the train, the needful did fork out,
Bought my ticket, said good-bye, kiss me, ducky (*smack akiss*).
Oh, my!

But I found the train was wrong and shouted out:

Chorus.

Oh! Mr. Porter, these are not the cars,
For I want to go to Brixton, and they're taking me on to Mars;

Oh, send me back to London as quickly as you can—
Oh, Mr. Porter, what a silly girl I am!

II.

My living I don't want to earn, but mother says I must;
She says, unless we get some oof our home will simply bust,
But when I have a brother here (*points to LEONARD*) it is extremely hard

That I should work and he should laze and do the lardy dard.
Typewriting I've taken on and dued my hair in fashion,
For a taste of matrimony 's joys I yearn.
And now I'm off to Mars above, I'd better cultivate true love,
And hope a lonely girl immortals will not spurn.

Chorus.

Oh! Mr. Cupid, what shall I do?
I want to find a husband, and of course I look to you.
Trot me out some Greek gods as quickly as you can,
They're better than none, but for frivol and fun
I much prefer a man.

Thus all is prepared for the A.A. trip to Mars, and thus they express their intentions:—

CUP. So, we're all for Mars. I've been and nicked him (*points to COCKTAIL*).

Behold my triumph, this is Venus' victim.

MERC. And I have booked this skittish old Hibernian (*points to MRS. M.*),

For Zeus to ogle over his Falernian.

MRS. M. I'll go to Mars and see me daughter queen.

I really want a shmoke, where's my dhudeen?

JOS. If I go there my prospects will be brighter,
For I'm Theosophist, Masseuse, and Typewriter.

LEO. And I'll go there to preach my Art and Letters,
And teach the Gods how to respect their betters.

COCK. And I to buy the planet for Chicago.

Let's have a drink, so all unto the bar go.

Which they do, singing a new version of the Association anthem, "Troll, Troll."

Chorus.

Troll, troll, bonny brown bowl,
A lass and a glass and a friend for me;
This is the toast all good fellows boast,
Whether of high or of low degree.

II.

LEO. Rhyme, rhyme in sunny clime,
Why should a poet not dream all day?
The better the sort of a kind of a thought
The sweeter the drink when the sun's away.

III.

JOS. Sigh, sigh and pipe the eye,
Why should a woman not woo a man?
I'll go to the skies and mesmerise
All lovers defunct since the world began.

IV.

Mrs. M. Hurroo for Brine Boru!
I'll go and see me daughter queen,
And I'll lay odds the murderin' gods
Will soon be a wearin' o' the green.

V.

MERC. Flit, flit to realms lovelit,
The lightning streak is on the move.
A button we press, in a second or less
We'll be taking some tea with the Queen of Love.

Of what happened when the A.A. party joined the Immortals in the sphere of Mars we must tell next week.

NUNRAW CASTLE.

THE following paper—the last he was destined to compose—was read by Mr. John McLachlan at the visit of the Edinburgh Architectural Association to Nunraw Castle, Haddington:—Nunraw was, as its name indicates, a nunnery before the Reformation, and was an appanage of the abbey of Haddington. That abbey was founded and endowed in 1178 by Ada, Countess of Northumberland, who was the mother of two of our Scottish kings, Malcolm IV. and William the Lion. Chalmers, in his "Caledonia," informs us that "the Church of Garvald with its pertinents and a carucate of land adjacent were granted to the Cistercian nuns, which the Countess Ada settled near Haddington during the reign of Malcolm IV. They established a grange near the church, and formed a village, which thus obtained the name of Nunraw. They also acquired the lands of Slade and Snowdown, forming together almost the whole parish of Garvald." We find in the story of the nunnery that James II. granted to Dame Elizabeth Hepburn, prioress of the Abbey of Haddington, a royal charter to "fortifie the nunnery and to make it into a fortalice or castel, and to have guns aye loaded to shoot at our alden enemies of England." The church of Garvald, and the large extent of territory above indicated, remained with these opulent nuns until the Reformation, a period when many a fair estate was lost to the Church and the general good to satisfy the lust for land of the ancestors of many of our great families. We can sympathise with the indignant denunciations by John Knox of the wholesale robbery of the Church lands by many of the very men who professed to hold up his hands as the Apostle of the Reformation.

At this time the nunnery and lands came into the possession of the family of Hay, in whose hands it remained until quite recently, about 1865. The Hays were thus in possession of the property for the long period of 300 years. Of the family, history says little or nothing. They no doubt discharged their duties and responsibilities as landowners in a becoming and fit manner. One of the most recent members of the house, of an artistic and architectural turn, became possessed with the idea of restoring the building to the condition in which it originally had been. This was about the year 1860. He called to his aid the assistance—the professional assistance—of one of the most able and charming members of our profession in my time. I mean the late Mr. Wardrop. The house before us is the result. Mr. Hay did not live sufficiently long to see the result of his endeavours to restore the old fortalice. He died in the midst of his schemes of restoration in 1863. The idea of restoration, however, was handed on, and Mr. Hay's son carried on and completed the schemes projected by his father. This was in the year 1864.

The work done by Mr. Wardrop is excellent of its kind, as everything he did was excellent and scholarly. No one could desire a more excellent reproduction of an old building. Every detail, the hinges and locks of the doors, the carved panelling of the doors and shutters, the oak floors, the ceilings of timber, the solid walls, the absence of all strapping and lathing, the ironmongery—all these details, in addition to the general arrangement of the house carried out on the lines of an old Scotch mansion house, with the modern requirements of additional light and space—all these points show the work of a genuine artist, and I rejoice in this opportunity of paying a small tribute of admiration to the work of a professional brother, as I do most heartily to this work of our late friend, Mr. Wardrop. At the same time it remains a question whether restoration has in this case not been overdone. Scarcely a vestige of the original building remains visible. The central tower is almost all that remains. All the rest has been veneered with new red masonry and rearranged and transmuted, so that it is utterly impossible to define what is old and what is new. It seems to me that with our modern and, as I hold, correct notions of dealing with an old building of this class, it would have been wiser to retain the old building practically as it was, doing such repairs and works as were necessary to preserve it from decay and make it useful, if that was possible, as a portion of the mansion house, at the same time retaining its distinct individuality as the original structure. The sentiment of having a hoary building with five centuries of legend and story beside you—veritable undeniable history in stone—is worth all the comforts which modern architecture can devise. I do not press this point, however, as I know there is considerable diversity of opinion. I shall express, however, and I express it confidently, as I am sure it is the opinion of you all, that it is a pity that Mr. Wardrop has preserved so little of the old building.

In the course of the renovation a discovery of great antiquarian interest was made in 1864. In removing the ceiling of the then drawing-room, and while the plastering, lathing and strapping were being removed, a second ceiling was discovered consisting of oak joists placed about 15 inches apart, and the wooden boards nailed upon the oak joists. These joists and the long panels between the joists formed a groundwork for the decorator of three centuries ago, and the result is that we have

before us a painted mediæval roof entirely covered with an endless variety of figures drawn with great freedom of hand, and in great variety of colour, as fresh and vivid as the day on which they left the hand of the artist. The apartment in which these interesting remains of painting were discovered was a large and important apartment measuring about 30 feet by 18 feet, and about 16 feet in height. The conclusion came to with regard to the apartment, from its size and consequence, was that it had been the refectory of the nunnery where, as Mr. Croal says in his admirable guide-book, "once or twice a day at least, all the sisterhood met the Lady Superior, and where they partook of the liberal cheer that helped to compensate for the solitude to which they had voluntarily consigned themselves." Describing the panels, Mr. Croal says:—

In one place, not far from the door, was a large receptacle neatly hewn out of the stone, that possibly in its time had held good store of the French wines that were then in use. Be this as it may, the manner in which the hall had been adorned leaves little room for doubt as to the cheerful purposes for which it was used. Fourteen strong oaken joists span the ceiling crossways to its length, the whole of the exposed surfaces of which are painted over in stripes of lively colour. No deafening having been used in those times, the intervals between the joists formed so many long panels the entire breadth of the roof, on which the inventive genius of the decorator had been exercised with much taste and skill. The most prominent object in each of these panels was the title and armorial bearings of the monarchs who flourished at the time. There had been originally twenty-eight of these, two for each panel, but several were now defaced, in some cases from damp, and in others from the ceiling above having been cut open by one or other of the modern proprietors of the house. By far the larger number, however, were in perfect preservation. Beginning with the east end of the ceiling, the first panel contained the titles and quarterings of "The Emperor of Rome" and "The King of France"—the other portions of the space being filled up by lively representations of birds, animals, mailed hands and allegorical figures, of which cupids or angels, it was difficult to say which, stood out most prominently among the number. The next panel contained the titles and armorial bearings of "The King of Scotland" and "The King of England"—the lion rampant of Scotland and the three lions passant of the sister country being very boldly represented. There was here again introduced a variety of figures, some of which, from the oddity of their appearance, could be claimed by neither earth, sea nor sky. The other panels were filled up in a similar way; and some approximation was to be obtained to the date of this curious ceiling by the occurrence of the titles of "The King of Navarre" (Navarre) and "The King of Arragone"—kingdoms which for the last three centuries at least have been incorporated with that of Spain. Other panels contained the titles and quarterings of "The King of Denmark," "The King of Portugal," "The King of Sweden," "The King of Cecilia" (Sicily), "The King of Friesland" (possibly Holland), and several others of which the names could only be guessed at. "The King of Egypt," however, was very distinct, his armorial bearings being represented by three serpents. In the centre of the roof the words "GRATVS ESTO," in Roman letters, were visible, along with the monogram "P. C. H." The figures which filled up the other parts of the panels were of every possible character—heraldry, with its endless tribe of griffins and other monstrosities, having been laid under contribution to supply subjects for the fertile pencil of the artist. Among the other figures occurred four representations of the "human face divine"—two male heads and two female. They are painted with much freedom and vigour, and were possibly intended for portraits of the founders of the nunnery. One of the male heads was crowned, and not improbably represented that of David I.—that "sair saunt for the Crown."

One interesting point about this ceiling is that a considerable portion of it is to be seen in the Antiquarian Museum of Edinburgh, and that portion shows what purports to be the heraldic representation of the king of Egypt with three serpents. The probable date of the ceiling is about the end of the sixteenth century, the time of James VI., say 1570 or 1580. We have two or three well-authenticated ceilings of the same date—one of an old house in Linlithgow of 1570, and the other of the large upper room in Pinkie House which we visited some years ago, and is undoubtedly about the same time.

PHOTOGRAPHY IN COLOURS.

IT was announced once again the other day, this time from Paris, says the *Standard*, that photography in colours had been achieved, and that specimens of that fleeting art were on their way to the Chicago Exhibition. The telegram which we print from our Paris correspondent this morning shows that what M. Lumière has really done falls very far short of the scientific feat attributed to him. There has scarcely been a year since the goodly art of sun-picturing began in which sanguine persons have not been led to indulge in great expectations regarding the accomplishment of what may, without exaggeration, be described as the one great thing still left undone before photography can be considered perfect, even in the imperfect way in which the laws of nature can be made subservient to human art. It is barely a year since Mr. Ives, an ingenious American, was exhibiting to us beautiful specimens of what were popularly described as photographs in colour,

though perhaps it would have been more accurate to consider them as very interesting specimens of optical illusions. At all events, Mr. Ives's exhibits at the Royal Society's conversazione and at the Royal Institution's evening lectures were not what the longing world means by photography in colours. That is to say, they were not impressions on a sensitive plate of all the hues of the scenes presented to it, just as we see in a negative all the minutiae of the same objects represented in black and white. When the photograph is produced which exhibits a reproduction of what is reflected on the ground-glass "back" of the camera, then this goal will have been reached. But that, for reasons good and sufficient in the present condition of optical and chemical knowledge, is not likely to be accomplished. Nor, of late, has it been seriously attempted. The experimenters who aim at coloured photographs seek success rather by pressing the laws of optics into their service, and so far promise better results, though their photographs, whatever they may be called, are, as we have said, more or less optical illusions. But as all the beauties of colour are simply the effects of light playing pranks with our optic nerve, it matters very little what we call the plate so long as it reproduces in an approximate form what is presented to it. The image in the camera was familiar enough to thousands before Daguerre—or the nameless youth who left the completed result in Chevalier's shop and never returned—managed to fix it. It would be rash, therefore, in spite of many failures and an infinitude of quackery, to assert that the photographers who are struggling in search of this evanescent possibility are mere dreamers of dreams. The one thing which makes photography regard its present victories as poor compared with its future triumphs will, no doubt, before the next century has passed its first decade, or even before this one has ended, be as familiar to us as photography in black and white is to-day, and be regarded by the next generation as a matter of course.

The latest specimens of photography in colours seem to mark a distinct advance upon anything which has preceded them. Taking the account as it stands, we may assume that M. Lumière—apt name for one who has so adroitly pressed light into his service—has produced something very remarkable, which, at all events, has all the appearance of what it claims to be. One of these pictures represents a bouquet, with red, violet, green, blue, and other colours in their various tints. A second, in its way even more striking, because the focussing must have been more difficult, gives part of a park with a blue sky, gravelled avenue, and trampled soil. A third plate shows a cottage in full sunshine, surrounded by shrubberies; while a number of others portray—all, it is claimed, in their true colours, and direct from the objects photographed—bright-hued placards, Japanese screens, and the like. So far the tests seem fair enough—if everything is as the operator affirms, and no doubt believes it to be. Hitherto, he admits, he has been unable to multiply any picture. As was the case with the old daguerreotypes, each plate must be unique; the art of taking proofs on paper is still a discovery of the future, though not one of anything like the importance of that which M. Lumière claims to have brought so far on the way to practicability. Nor is it at all likely to be popular with the "sitter" for a portrait. For, in the present state of the art, the half-hour's pose which is demanded would be almost as tedious as the early sittings for daguerreotypes. These photographs will, if not as disappointing as their predecessors and as evanescent, be deservedly associated with M. Lumière. But in reality they are simply improvements on those of M. Lippmann, an eminent French physicist, which some years ago created at first a certain scientific sensation, followed by much disappointment as a result. The experimenter, it may be remembered, photographed the spectrum in colours, painted windows and the like. Now, M. Lumière has advanced a step by simplifying the process. At the same time, it will seem to most photographers a little doubtful when his process is described as simply taking the views on "prepared gelatino-bromide plates equally sensitive to all colours." A mirror is placed behind the plate, and "the conflict of the incident and reflex lights produces alternations of light and shade resulting in a chemical phenomenon allowing a photographic delineation of the object." This seems, as a description, very like "drinking tea by stratagem," or "telling the clock by algebra," and yet it is decidedly too simple to solve the gigantic problems presented to us. For the great difficulty is to cover a plate with a chemical which is "equally sensitive to all colours," and, in any case, even if photography in colours has been accomplished, it is idle to expect the bright tints of nature, since, as Captain Abney pointed out long ago, these are, as a rule, produced by sunshine, whereas on the plate they have to be viewed by diffused light.

M. Lippmann's was, nevertheless, the first true departure on the right track, and, so far as we have seen, still remains—with M. Lumière's improvement—the most promising. His results, however, did not escape severe criticism. They were stigmatised as simply specimens of iridescence—that is to say, their colours were due to the same causes as those

which produce the spectra on a piece of mother-of-pearl or on a soap bubble. This is perfectly true. Yet, when viewed at the proper angle, the spectrum tints were really very brilliant, though decidedly dull compared with those of nature. It may also be remembered that, apart from this fact, they were to a certain extent mechanical, being produced on a laminated surface, a *modus operandi* suggested but never carried out by Lord Rayleigh as early as 1857. M. Lippmann, it is, however, proper to add, never affected to claim for his work the status of "photography in colours." It was simply a pure spectrum produced by a strong light, not the photography of composite colours reflected from natural objects illuminated by diffused light. Yet even at the time authorities as unimpeachable as Professor Meldola were confident that he had accomplished much, and in the direction he had taken might accomplish a great deal more. Whether that eminent chemist will consider as favourably M. Lumière's discovery an advance in M. Lippmann's track, or a divergence from the path suggested by him, remains to be seen. Mr. Ives's pictures were pretty. But neither did this experimenter claim for them any higher rank than that of a superposition of coloured pictures produced by mechanical means, imitating a natural effect. He never pretended, except in the inflated reports of his countrymen, to have solved what Professor Meldola calls "the photographic problem of problems." It is no doubt true that photography in colours is surrounded by so many almost insurmountable difficulties that it is excusable to regard it as unattainable, although we must not fail to credit M. Lumière with the service he has done to his art in making what our Paris correspondent describes as almost perfect photographic plates. But he has not found a practical solution of the problem of colour-photography. A score of similar claims have been made within the last thirty years. Indeed, it is not long since a certain Herr Verescz, of Klausenburg, in Transylvania, was vouched by no less an authority than Dr. Eder, of Vienna, as having all but reached the long-sought-for goal. He actually produced proofs in natural colours, but was unable to retain any except those between deep red and orange. Even these, if exposed to light, faded in from two to three days. This seemed the crux. Herr Verescz had not attained what he aimed at, and the result has been that we have heard no more of the Transylvanian photographer than we have of the many experimenters who preceded him in the same line.

PHOTOGRAPHY AS AN AID TO ART.

AT the meeting for the distribution of prizes to the students of the Art Training School, South Kensington, an address was delivered by Mr. W. F. Yeames, R.A. He pointed out that the standard of work required from artists was getting higher every day, the competition, owing to the increase of their number, being also very much greater. Students must always bear in mind that the instruction received in schools was always technical only, and that they were but on the threshold of art when they left the school, and must depend for success upon their individuality. When they entered into their work in the field of art they would come under many influences, and it was on one of these he wished to dwell, that of photography. Photography had done a great deal, especially for art. In one branch it had been an enormous help in the reproduction of the works of fine art throughout the world. Photography was a feature of the age of science and mechanical appliances, and, like all things scientific, dealt in facts. In no photograph did one see any expression of the emotions of the heart; but these were qualities which they, as artists, would have to deal with. In a broad way he would say the art of drawing had improved under the influence of photography, but he would make a slight exception as regards the rendering of human form and face by the great masters. He could not say that photography had excelled the productions of these great men who had such a keen perception of everything in nature that they were able to produce results that photography had never surpassed. But with nature in general, vegetable life, clouds, &c., photography had brought to light many things not known before. With reference to when and how students should use photography, he said the artist could use it with impunity when his knowledge enabled him to do without its services: that is, a man should be master of photography, and not photography master of the man. Before using it he should be so well grounded in the technique of drawing as to be able to draw any object in nature; photography would then be of much use to him, as it would lighten his labour and extend the range of his subjects. Photography should be used only as an aid to art work.

ANOTHER magazine for juveniles has been started by Mr. Henry Potter, 211 New Kent Road, under the title of "Pleasure." The first three numbers for March, April and May have been forwarded to us. Though the price is only one penny, the matter has been so well selected that it cannot fail to interest youngsters.

TESSERÆ.

William Hogarth.

IN his life not less than in his works, Hogarth presents a sturdy protest against all previous styles. No man more distinctively and decidedly original and creative—not even Phidias of Athens or Giotto of Florence—ever handled art; no one, for good or for evil, was ever less affected by pre-existing influences or by contemporary criticism. The modern art of Europe began as completely with him as its modern poetry with Dante; and as Dante's fellow-countrymen were at first unable to believe that a great poem could be written in their mother tongue, so Hogarth's were incredulous that England could produce a painter. He first, with a serious and widely-extended scheme, put into painting what Fielding put into novel-writing; he brought the canvas down from mythology and pageantry and made it tell the real story of common life—its pathos, its meanness, fashions, humours, tears, laughter, triumphs, and depths of degradations. Clowns, fops, lords, rebels, politicians, gamblers, labourers, soldiers, brides, mistresses, spendthrifts, poets, musicians, madmen—nay, the very wigs and queues and walking-sticks of the age—all move and live on the stage of his marvellous theatre. In a sense true of no other artist, Hogarth held up his mirror to nature, and gave back the form and pressure of the time with a strength only equalled by his subtlety. Shakespeare (always exceptional) excepted, no artist, not even Crabbe, has drawn so many characters for us, has given us so much healthy laughter, so much of "the sorrowing by which the heart is made better." Yet, in this prodigality of power one thing is wanting—not perhaps to his mind, but to his pictures—the charm of beauty is not conspicuous here. Occasional touches of grace or repose occur, the severity is not without sweetness; yet the higher sphere of loveliness is hardly reached, there is no clear sense of the poetry of nature. Through his stern, honest-hearted rejection of Italian art, abused and ill-estimated as he saw it by the men of taste about him, he missed this gift in marked intensity.

Greek Painting.

The earliest notices of Greek painting depend almost entirely on tradition or casual mention. To divest them of their ordinary fanciful accompaniment would be to deprive them of some very poetical idea congenial with the times, the subjects, or the associations with which they are so intimately blended. We should be sorry, for example, to abandon the fabled origin of the practice of the simple contour which, as Pliny informs us, arose from the fact that Gyges, the Lydian, observing his own shadow cast on a wall, immediately outlined it with a piece of charcoal. Notwithstanding the physical difficulties of the situation, the story is in keeping with the poetical genius of the remote period to which the incident is ascribed. The simple monochrome of the school of Corinth announces a further advance in the early practice of painting, of which, if no mural or movable tablet exists, it is yet attested through the instrumentality of the fictile vase. If the charms of colour or light and shade do not exist in these vases there still remains the power of specifying beauty of contour in the various effects of the different passions on the human form. It is also easy to express differences of race as well as physiological and other peculiarities. But it was not long before attempts were made to enhance the simple contour by the introduction of colour, and as we again learn from Pliny, Cleophrastus, the Corinthian, was the first to avail himself of chromatic agency by employing in his designs the ground fragments of a red potsherd. Attempts at perspective were beheld in these *catagrapha—oblique imagines*—attempts at foreshortening the discoveries of Cimon of Cleonæ. Subsequently came Polygnotus and his school, whose historical pictures adorned temples and porticos. Some of these applied principles of linear and aerial perspective, or at least of sciagraphy, with the illusive powers which they contribute, to the realisation of scenic effect and to the decoration of houses. Apollodorus and Agatharcus carried these arts to great perfection. Even earlier than the days of Sophocles these appliances are supposed to have been cultivated. The resources of the art were now being increased by the aid of science, which supplied additional powers, by whose means the fascinations of illusion conciliated and won the popular favour. The rivalries between Zeuxis and Parrhasius prove the extent to which imitation was carried, as well as the value attached to it by public appreciation. *The Hand of Alexander holding the Lightning*, by Apelles, so well foreshortened that it appeared to project from the picture, is another evidence of the application of scientific principles. Like other fables, they point a moral, and prove to us, that there were then, as now, persons who attached an undue importance to the mere realisation of imitative truth. As an evidence of the extent to which nature was studied, they may be accepted, but we are not therefore to believe that these artists based their claims to renown on such humble views. The fame of Zeuxis was established on more solid grounds. His celebrated single-figure pictures of Juno,

of Venus, of Cupid and of Marsyas were all of high repute. That he was fastidious also in his endeavour to embody character we know from the account of the variety of models he employed for the production of his *Helen*.

Vulgarity in Painting.

Art is, in truth, a great tell-tale, and no painter can effectually conceal himself in it from those who understand its language. Of all the qualities of the mind there is nothing more sure to be betrayed by the pencil than innate vulgarity—no matter with how high an aim or with how much of learning or of technical power it endeavours to pass for what is lofty. On the other hand, a mind is sometimes discovered by the art alone to be much superior to any prejudgment that might be formed from our knowledge of the education or personal habits of the individual. Of this there is not a more remarkable instance than Morland, whose works display a natural refinement of taste which, as in the best Dutch art, is the more striking from the homely character of his subjects. When we look at his pictures, we must conclude that dissolute habits, which in the prime of life destroyed this extraordinary man, were in great part to be attributed to the denial of all education to him, excepting in his art; by a sordid father, and which greatly increased if it did not produce that shyness of manner which drove him from decent society to the alehouse and the stable; while it left him unfurnished with any resources of relaxation excepting in low indulgence. But whatever were the failings of Morland, and however to be accounted for, there is not the slightest taint of vulgarity in any work of his hand. He is often homely, often slight to a fault, and it is said he was employed by a patron to paint a series of immoral pictures—yet such is the refinement of his colour and his true feeling for the simplicity of nature that his works will always sustain companionship with those of Gainsborough, which can be said of no painter in the least degree vulgar. The essence of the vulgarity that is most offensive is pretension; and it therefore generally aspires to the high places of art where it shows itself in every species of false sentiment. It greatly affects the superfine—it produces the mock heroic—and all the numerous mistakes of the exaggerated for the grand and the poetic. The styles of Spranger and Goltzius are vulgar from their inflation, from their attempted imitation of art that was far above their powers of comprehension. Rubens, Rembrandt and Murillo are vulgar when they give us meanness of character where elevation is required. Instances from the works of the first and the last are close at hand—the Moses and Aaron in the “Brazen Serpent” of the former and all the personages in the “Holy Family” of the latter in the National Gallery—but the utter and most remarkable subversion of the art by vulgarity, for it was vulgarity mixed with the highest refinements of vice, took place in France in the reign of Louis XV. It began indeed under that of his predecessor, a monarch who fancied he showed his taste by ordering the works of Teniers out of his rooms.

Criticism of Modern Architecture.

A practice most disheartening to the architect, and one which is common enough with half-educated judges, is to base a judgment as to the merits of an artist (and an architect perhaps in particular) by comparing him and his works with others who, in the past under favourable circumstances, in which he never has been or could be placed, have produced more excellent works than his. To be continually using the names of the great masters of antiquity, and declaring that all men are feeble because they do not produce the same results that those great masters produced, is unjust in the highest degree, and exercises as ineffectual an agency as can be conceived for the introduction of general improvement. There may be errors in contemporary art, but it is not to be elevated by vague parallels between things which really do not admit of just comparison. “Art,” as has been well remarked by Dr. Memes, “has never been reformed, after a lapse from high eminence, by mere imitation of examples, however excellent, nor by only following rules for the correction of error. It is here, as in morals, that example succeeds where precept would fail. Some mind of uncommon firmness and good sense is required, who, beginning with nature, brings to the work of reformation original powers and severe judgment, fancy and feeling, with correct and cultivated taste—one in short of those rare minds whose merits, great in themselves, become incomparably greater viewed with the times in which they commence their career, and whose exertions, wonderful in their own accomplishments, are yet more admirable from the progress which thereby others have been able to effect.” If such be the influence of genius, it is surely the duty primarily of professional men, and secondarily of cultivated public opinion, to recognise such minds when, from time to time, they present themselves, and to aid, as far as may be, with no little-ness of envy or jealousy, the onward footsteps of those whose heaven-born gifts may fit them to lead rather than to follow. Nothing in history is more unsatisfactory and detrimental to real progress than to recognise in the lives of great men the

misérable jealousies and misapprehensions which have retarded them in their career, and militated against the good which, but for those drawbacks and that unreasonable friction, they might have effected. Happily architecture, as an art, is not as liable to unreasonable criticism as other branches of the fine arts. Its very firm alliance with utility, as well as with beauty, gives it a practical character which allows of the ready application of reason as an element in test and success or the reverse.

Stone under the Microscope.

It is often held that the best method of determining the probable durability of a building stone is to study its surface, or thin transparent slices, under a microscope. This method of study in recent years has been most fruitful in developing interesting and valuable knowledge of a scientific and truly practical character. An examination of a section by means of the microscope will show not merely the various substances which compose it, but also the method according to which they are arranged, and by which they are attached to one another. For example, pyrites is considered to be the enemy of the quarryman and constructor, since it decomposes with ease and stains and discolours the rock. Pyrites in sharp, well-defined crystals sometimes decomposes with great difficulty. If a crystal or grain of pyrites is embedded in soft, porous, light-coloured sandstones, its presence will certainly soon demonstrate itself by the black spot which will form about it in the porous stone, and will permanently disfigure and mar its beauty. If the same grain of pyrites is situated in or near very hard, compact, non-absorbent stone, the constituent minerals of which are not rifted or cracked, this grain of pyrites may decompose and the products be washed away, leaving the stone untarnished.

Seasoning Stone.

The thorough drying of a stone before, and the preservation of this dryness after, its insertion in masonry are commonly recognised as important factors of its durability; but the exact nature of the process of seasoning and of the composition of the quarry-sap removed by thorough drying have never been determined. The quarry water may contain little else than ordinary well water, or may be a solution more or less nearly saturated, at the ordinary temperature, with carbonate of calcium, silica, double salts of calcium and magnesium, &c. In the latter case, hardening results from the drying, and an exact knowledge of its nature might throw important light on the best means for the artificial preservation of stone. Again, water may exist in large quantity, in chemical combination, in the silicates (e.g. chlorite, kaolin, &c.) or in the hydrated iron oxides which constitute the cement of a building stone.

Unity in Architecture.

Simplicity and directness are cardinal virtues in all architectural arrangements. Avenues should be as straight, as short and as obvious in their course as possible. The rules for the moral conduct of a man are very applicable to this branch of our art; his ways should be clear and obvious, free from ambiguity and uncertainty, without tortuous or dark places. When a turn is necessary, let it be one which cannot be mistaken. There should be no seeking for the way in or out. The first impression on entering any building should be such as is becoming its special purpose. The temenos of a Greek temple was well calculated to give an impressive air of sanctity to the temple itself, by excluding from view all incongruous and mean objects, enhancing, too, the architectural effect of the façade by surrounding it with suitable accessories. A similar feeling, perhaps, led the early architects of Christendom to form that peculiar forecourt or atrium in front of the naos, of which but few examples now remain, although probably this atrium was an essential part of every early Christian church. The basilicas of San Ambrogio at Milan, and of St. Clemente at Rome, are very interesting and nearly complete examples. There can be little doubt that the builders of that devout age were influenced by subjective considerations of this kind, although the ritual appropriation of this portion of the building was to receive the catechumens of the Church, and to afford a suitable and becoming place wherein the candidates for baptism might present themselves. At all events, a very powerful effect must have been produced upon the eye and mind by thus shutting off from view the outer world, and concentrating attention on the more sacred structure about to be entered. It was, perhaps, a similar motive—a legitimate artifice for the purpose of strongly impressing the mind of the worshipper—that led our old church builders usually to form their doorways of very moderate dimensions. Great emphasis was ordinarily given to the western, and often to the lateral doors, by exterior decorations, and by recessed and gabled porches, often rising to a height of great grandeur; but the actual opening of the doorway will generally be found comparatively low. The natural effect of this is to produce, as it were, a surprise, and by the contrast to make more impressive the extent and loftiness of the structure within.

NOTES AND COMMENTS.

A REPORT has been presented to the Senate of the University of Cambridge by the Engineering Laboratory Syndicate. It states that the sum of 4,847*l.* 16*s.* has been raised by subscriptions towards the fund for the development of an engineering laboratory. In addition, several important contributions of apparatus have also been made. A part of the sum collected has been spent in providing apparatus for immediate use. About 4,100*l.* remains available for building or for the purchase of additional apparatus. The Syndicate recommend that plans drawn by Mr. MARSHALL for the engineering laboratory be approved, and that they be authorised to proceed at once with such portions of the work as they are able to execute with the funds at their disposal.

THE buildings of the Sorbonne, which are about to be demolished, are not entitled to be considered as extremely ancient. They were raised at the command of Cardinal RICHELIEU, and accordingly were used for over two centuries and a half. The first stone was laid in 1627. The Cardinal's buildings took the place of some which were old and dilapidated. The church of the Sorbonne, in which RICHELIEU's monument is to be seen, was built on the site of the College of Calvir, or "the little Sorbonne," which was demolished for that purpose, after surviving from the thirteenth century. It is strange that the Minister was insensible to the associations of a building that was founded by ROBERT DE SORBONNE as a preparatory school. There is nothing left which will connect the new Sorbonne with the old except the name and the educational principle which has been retained, although applied to a different sort of object. The aim of ROBERT DE SORBONNE was to afford instruction in theology gratuitously to poor students like himself at one time, and he wisely established his society at the foot of the hill of St. Geneviève, around which every experiment in education was welcomed. From 1253 until the suppression of the college at the Revolution, there were always at least six professors who held theological classes that were open to students without payment. Poverty was the badge of the institution. It was always *Pauperrima Domus*. The ablest doctors were, however, proud to aid in the teaching, and although the Sorbonne was only a part of the theological faculty of the University of Paris, it was accepted as being the most essential part. It was in the college the first printing press seen in Paris was set up.

A small sum of money was lately entrusted to the Boston Society of Architects to be expended in premiums for designs for the improvement of a part of the city known as Copley Square, in which buildings have been erected without any regard to general amenity. Twenty-two designs were submitted. The judges appointed were Professors WARE and CHANDLER, and Mr. E. M. WHEELWRIGHT, the city architect. They have assigned the first place to a design by Messrs. HARVARD, WALKER & KEMBALL, the second to Messrs. ROTCH & TILDEN's, the third to Messrs. ANDREWS, JACQUES & RAUTOU's, the fourth to Mr. H. L. WARREN's, and the fifth to Mr. W. G. PRESTON's. According to the judges the designs presented four essentially different methods of treatment. The first design shows a central area measuring about 270 feet square, occupied as a garden, with trees and seats, intersected by diagonal streets 50 feet wide. This treatment, it is said, has the three great advantages that it leaves the present line of Huntington avenue virtually unchanged (most of the other schemes contemplate a deviation of the avenue); that it affords shade and coolness at a point where they are specially to be desired; and that it offers a straightforward solution of the difficulties of the problem instead of endeavouring to evade them. Its merit, moreover, lies in the idea itself, and is quite independent of the way in which it is worked out. While it permits any amount of expense and richness in the shape of fountains, statues and other architectural embellishments, it requires for its satisfactory execution only a moderate expenditure of money. The second scheme shows a sunken area treated with steps and balustrades, seats and fountains. The architectural features do not compete in size or interest with the buildings by which it is surrounded. In the third

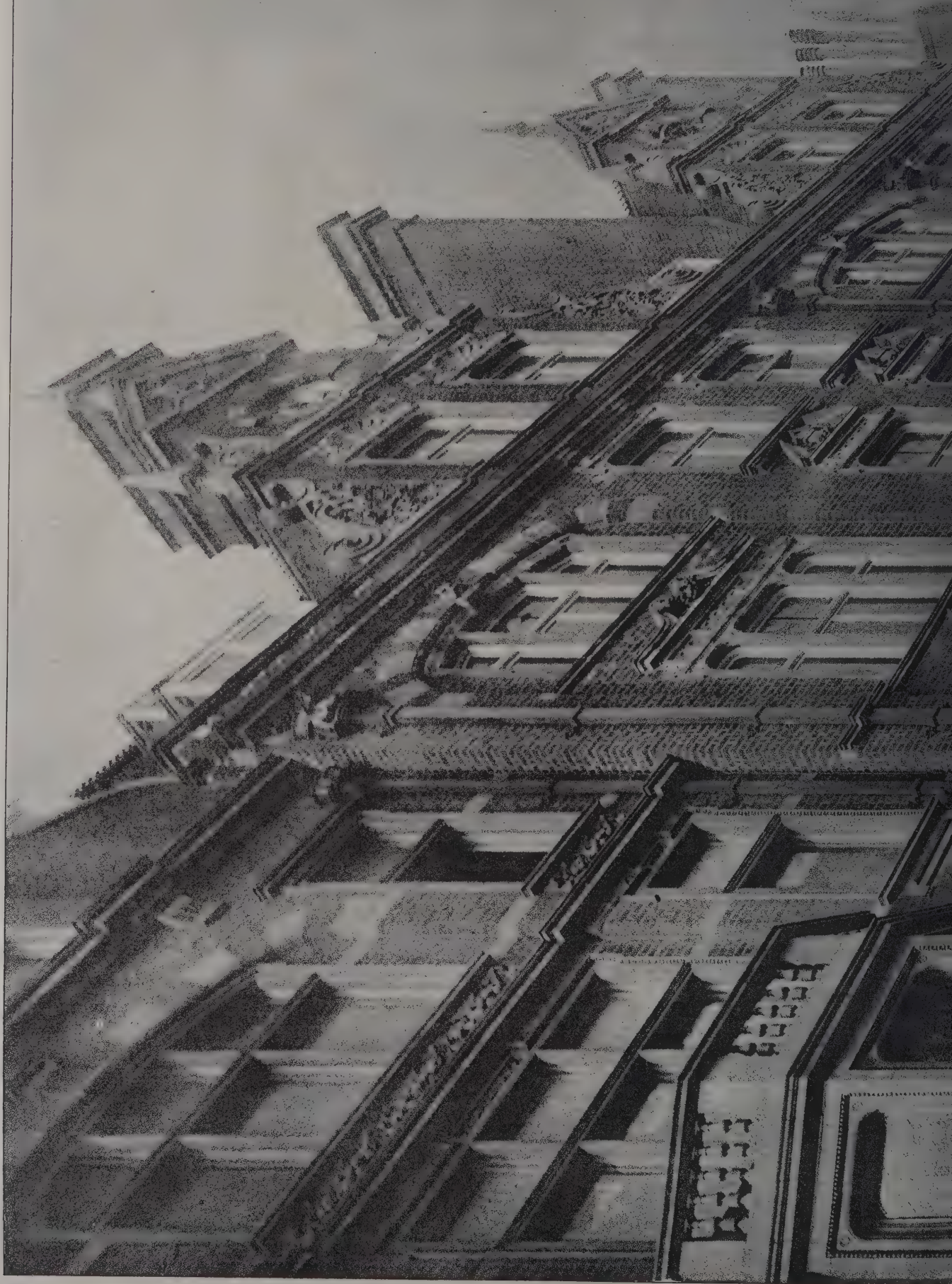
and fourth schemes the centre of the square has an octagonal or circular area decorated with seats and statues, the principal feature being a large monumental fountain in the axis of the Public Library and of the Museum of Fine Arts. In the four designs a fountain appears in the centre of the square, but in the fifth, as in many of the unsuccessful designs, a column or lofty monument is introduced which does not receive the approval of the judges. It is novel to find a society entrusted with the duty of selecting designs for a municipality, but at present there is no guarantee that the competition will lead to any transformation of the square except on paper.

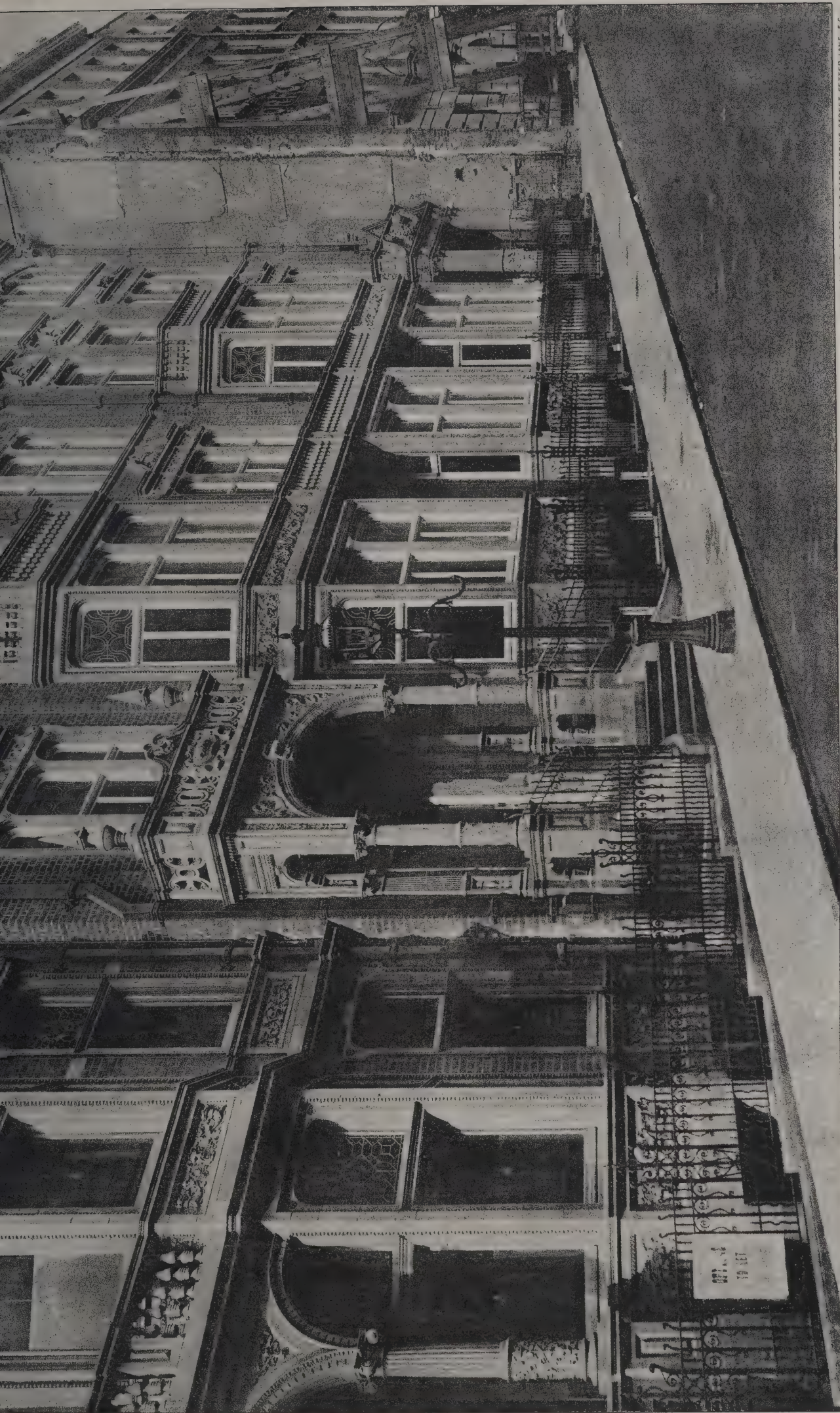
IN spite of all that has been done in the production of rival manuals, "WEALE'S Rudimentary Series" retains its hold on another generation of students. What seems to be a new departure will increase its influence. Originally the volumes were written by men who had some claims to be taken as specialists, and although they professed to treat their subjects for beginners, it was inevitable that they should consider many circumstances as too elementary for notice. Archbishop WHATELY displayed his sagacity when he said that the best writers of treatises were men who had not exhausted their subjects. The success of WEALE'S series, or at least of many among them, we imagine has arisen from the number of a superior class of students who were competent to use them. But workmen have now to be considered, and those in the building trades would not be able to derive as much benefit from some volumes in the series as pupils in architects' and builders' offices. The volumes entitled "The Practical Plasterer," by Mr. WILFRED KEMP, plasterer, and "Roof Carpentry, Practical Lessons on the Framing of Wood Roofs," by Mr. G. COLLINGS, are different in character from preceding volumes in the series. The new treatises might be written by workmen for the use of apprentices, to whom everything they see done is strange, and consequently the pages can hardly be too elementary. The experiment has our fullest approval. Both writers appear to have read books to which they refer, but we prefer those parts where they speak from experience. There is no likelihood that such treatises will supersede those on similar subjects in the series; rather they will supplement them, and it may be help to introduce the older volumes to an extensive class of readers.

THE experiment of trying to discover meritorious pictures by means of voting does not appear to have been successful in New York. The circumstances were curious. A Mr. HALLGARTEN bequeathed money to the Academy of Design in order that three prizes of 300 dols., 200 dols. and 100 dols. might be annually given to painters of American origin, and under thirty-five years of age, who had produced the three pictures which in the opinion of exhibitors were best entitled to the rewards. As high prices are obtainable for inferior pictures in the States, painters do not need relief in the form of money, and during the past three years the prizes were disregarded. This year the value of them was therefore quadrupled, and some painters condescended to become candidates. There was a busy period of canvassing by the friends of the competitors. After some trials, the first prize was obtained by MORGAN MCILHENNEY, the second by Mr. E. A. BELL and the third by Mr. H. PRELLERTZ. The voters were not satisfied with what they had accomplished in the way of selection, for before leaving the gallery they besought the Council of the Academy of Design to seek for an alteration of the process by means of which the awards would henceforth be made by a jury.

M. FRANÇOIS ALEXIS CENDRIER, who died in Paris recently in his ninetieth year, was the architect of the Palais de l'Industrie in the Champs Elysées, which is used for Salon and other exhibitions. But he found his most profitable commissions in railway works. The stations on the Paris and Lyons line were designed by him, and some of the principal termini in Paris. His success was recognised in 1851 by his admission to the Legion of Honour. He was one of the foremost architects in France to utilise iron in his buildings, and generally he was ready to sacrifice tradition to necessity. M. CENDRIER was a pupil of LEBAS and PANDOVER, and was one of the holders of the Prix de Rome.

The Architect, May 26th 1893.



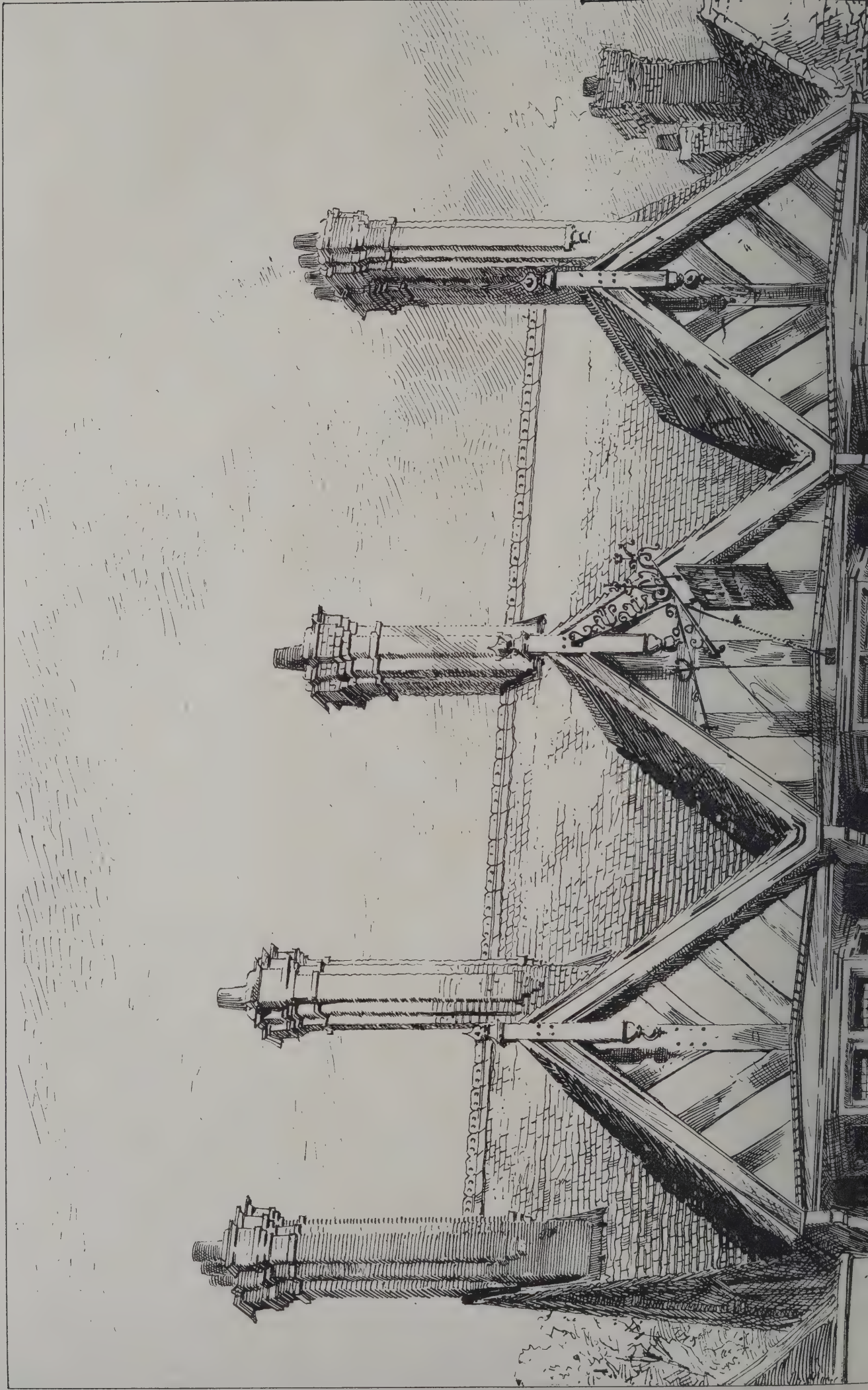


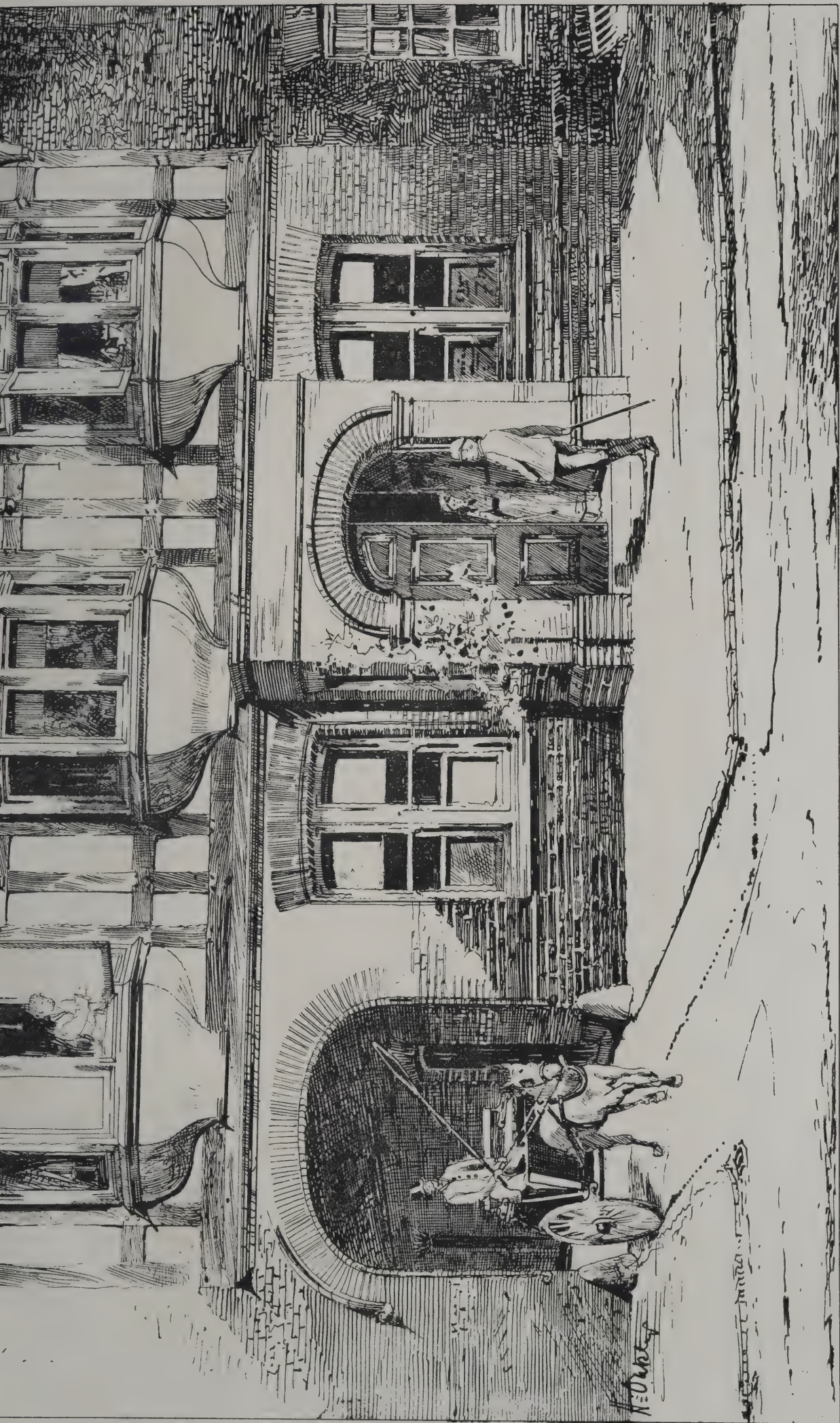
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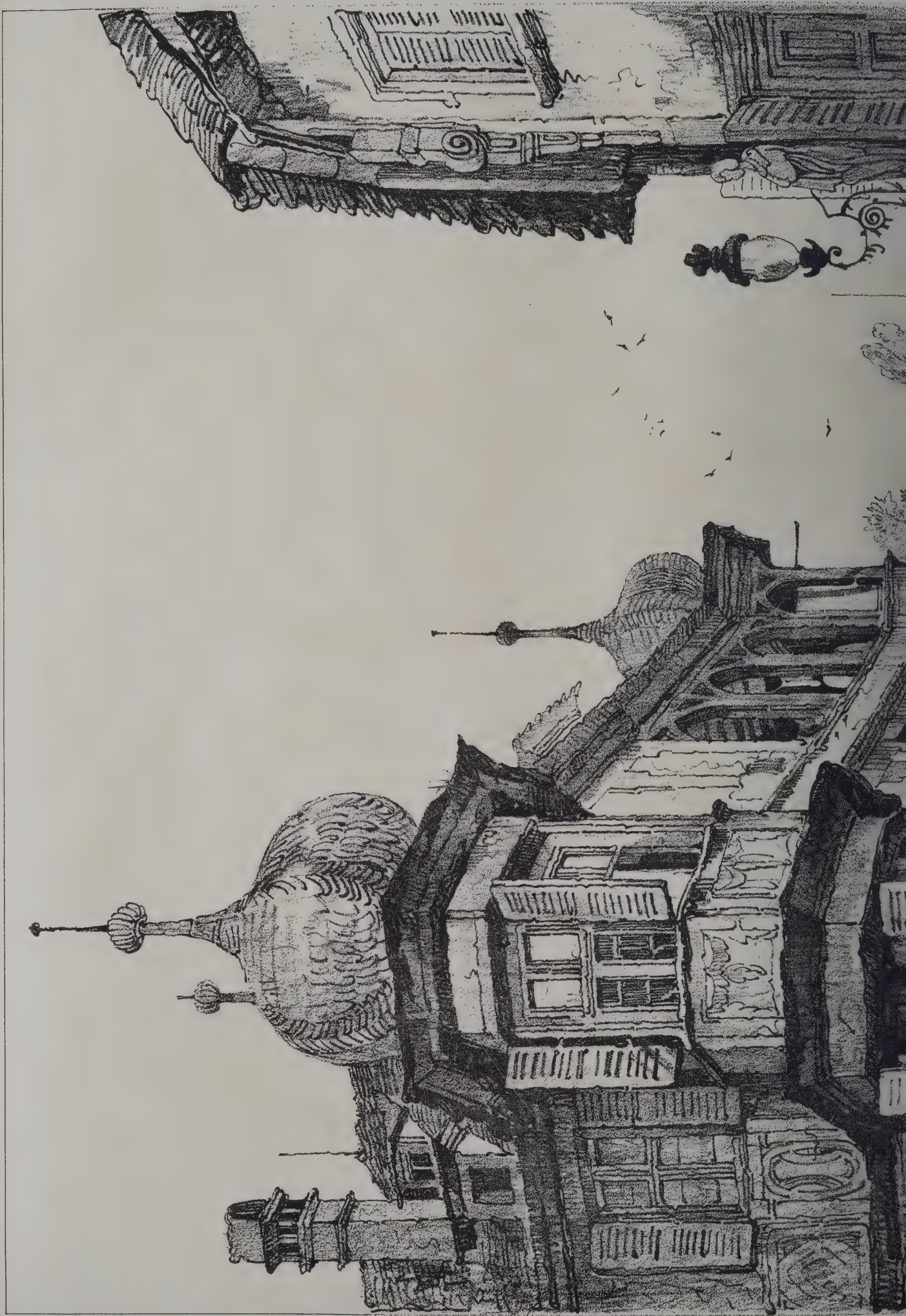
PARKER'S HOTEL, SURREY STREET, STRAND.
JOHN DUNN, Architect.

The Architect, May 26th 1893.





THE TUNS HOTEL, ODIHAM, HANTS.
GEO. W. WEBB, F.R.I.B.A., Architect.



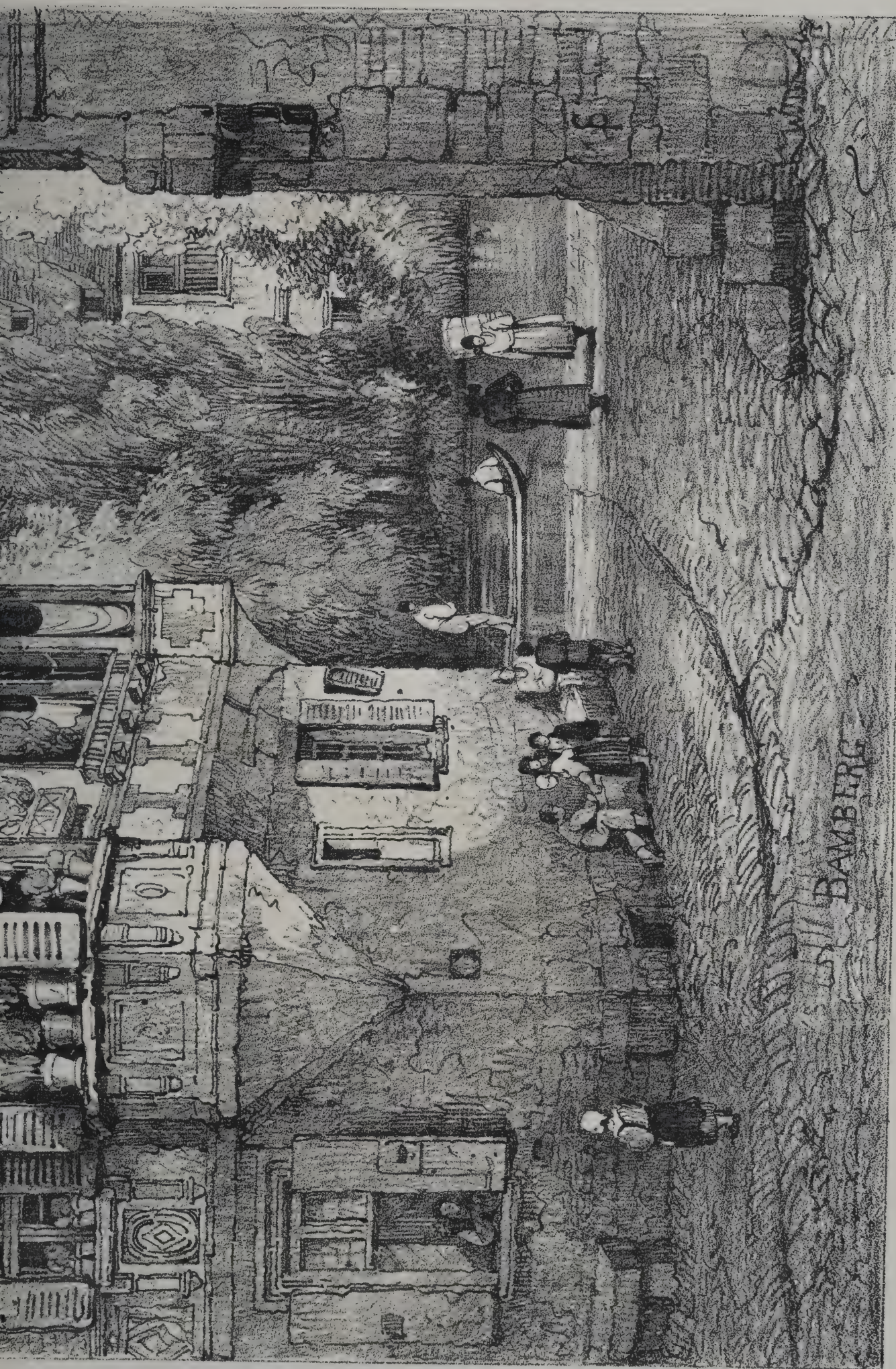


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BAMBERG.
Drawn by SAMUEL PROUT

ILLUSTRATIONS.

PARKER'S HOTEL, SURREY STREET, STRAND.*

THE revolution in the architectural appearance of some parts of London cannot be better exemplified than by a contrast between the old-fashioned private hotels and boarding-houses in streets off the Strand and hotels like the one we illustrate. Mrs. LIRRIPER herself would acknowledge that the change was an improvement. Parker's Hotel is undoubtedly as effective without as it is comfortable within, and it is one of those buildings we may often expect to see in the sketch-books of foreign architects.

THE TUNS HOTEL, ODIHAM.

THIS hotel has been rebuilt for Messrs. MAY & CO., Basingstoke, on the site of the old one destroyed by fire. It forms a picturesque feature in the main street. The contractor is Mr. J. HARRIS, of Basingstoke, and the architect Mr. GEO. W. WEBB, F.R.I.B.A., Market Place Chambers, Reading.

BAMBERG.

* From a photograph by Messrs. BEDFORD LEMERE & CO.

THE RICHMOND LOCK AND TIDAL WEIR.*

AFTER the removal of Old London Bridge the bed of the river became considerably lowered, but the effect of more water passing up and down with the tide was not felt until many years afterwards, on account of the numerous shoals between it and Westminster, when we have evidence that this increased scour caused the foundations of both old Westminster and Blackfriars Bridges to give way. More recently it has occasioned a large sum to be laid out in maintaining Waterloo Bridge, the foundations of which had become imperilled from the increased scour. Since 1862 very extensive dredging has been carried on both above and below London Bridge, so that further impediments to the flow of the tide have been removed, causing higher tides, whilst, on the other hand, few obstacles now remain to detain the ebb, which runs out very quickly, resulting in a reduced level at low-water.

The range of spring-tides at London Bridge in 1799 was about 15 feet, or 18 inches less than at Sheerness. Now the average maximum tides at London Bridge reach 21 feet, being nearly 5 feet more than at the mouth of the river. The oscillatory motion of the water travels up and down the river similarly to the swing of a pendulum, and although most of the increased range is due to elevation of surface, the water at London Bridge frequently recedes about a foot below the lowest sea-level.

Many people get the idea in their minds from witnessing the ebb and flow of the river that the tides are a fixed quantity which must be accommodated somewhere, otherwise the banks would be overflowed; but it is not so. The tide is simply energy from the mouth of the river in the form of a wave, which continues to exert itself until it meets with obstacles that deprive it of its momentum. The supply of water from the ocean is inexhaustible, and it must, therefore, be evident that if no water were permitted to pass, say, London Bridge, whilst the tide was coming in, the only result would be that so much less water would enter the mouth of the river.

The effect of the increased range of tide upon the neighbourhood of Richmond, it will be noticed, has been most remarkable. Before the removal of Old London Bridge the difference of level between the average high and low water at Richmond was comparatively small—only about 3 feet 6 inches. This afterwards became enormously increased, so that the difference now between the average height of spring-tides and low-water is over 10 feet. We have often high tides which rise 2 feet 8 inches above Trinity high-water mark; and on July 5, 1892, the lowest water ever recorded marked 11 feet below Trinity high-water, making an extreme difference in range of 13 feet 8 inches.

Memorials were first presented to the Thames Conservators from the inhabitants of the neighbourhood between Teddington and Brentford in 1860 and again in 1865, calling attention to the loss of water in the upper tidal reaches of the river. In June, 1871, a deputation waited upon the Board and complained of the lowness of the water and further deterioration in the condition of the river, urging the construction of a lock and weir in the neighbourhood of Brentford. After several months' consideration, the Conservators returned an answer that "they regarded as a most weighty objection to the scheme that it would exclude a very large quantity of tidal water, which at present exercises a most beneficial effect on the river below by the scour which it produces." The lowering of the low-water level, and the increase in the height of the tides, had been

gradually producing a changed effect upon the character of the banks of the river, which lost much of their beauty and picturesque effect. The extreme and continual alteration of the water-level ceased to produce the luxuriant growth of wild flowers, and the roots of the water plants no longer served to hold up the banks without camp sheathing or embankment.

Instead of the gentle, placid flow of the stream, which the fisherman and the lover of nature used to delight in, a rapid torrent began to take its place, which at some points in the river defied the utmost exertions of the expert oarsman. Water-lilies and weeds, which afforded cover for the fish, disappeared, and the scour of the tides brought up all the filth from the sewage outfalls below London, which, deposited on the foreshore, produced huge banks of mud where formerly it was almost as clean as the sea-beach.

The facts could not be refuted, and, in consequence of further representations, the Conservancy Board instructed the late Sir John Coode and Captain Calver to report to them whether, having regard to all the interests involved, it would be practicable and prudent for the Board to construct a lock near Brentford or Isleworth, and to advise the Board generally.

The result was a voluminous report, dated February 24, 1873, which, after reciting the facts and statements of the memorialists, admitted that "there is no doubt whatever that the comparatively pure water which formerly filled the upper reaches of the tidal Thames—say, from Kew to Twickenham—has been replaced by water charged with matter, more or less offensive, brought up by the spring tides, which in a state of comparative stillness has gradually dropped an offensive deposit upon the foreshores to, as far up as Twickenham, where it has remained and contaminated the air until the land-floods at the fall of the year have cleared it away again."

After dealing at considerable length with the tidal flow and its acceleration, which was regarded as an improvement to the river generally, it proceeded to argue that the river would silt up both below and above the weir, that it would cause tidal loss and injure the channel below it and that the navigation of the river would be impeded. It concluded with the recommendation that, instead of the construction of a lock at Sion Reach, which the late Mr. Leach, the engineer of the Conservancy, had estimated would cost between 25,000*l.* and 30,000*l.*, "That the river-bed be improved by dredging between Teddington Lock and Kew railway bridge to such an extent as will suffice to form as uniform a channel as possible, not less in any part than 100 feet wide at the bottom, with side slopes of four to one, the bed, within the limits named, having an inclination of 6 inches to the mile."

The estimated cost of the channel described was 34,500*l.*, and a plan accompanied the report, showing a further suggested general lowering of the low-water line, which, if carried out, would have involved the destruction of the two middle piers and three central arches of Richmond Bridge.

A copy of the report was furnished to the memorialists, with which they were very disappointed, but it does not appear that any plan accompanied it, and I do not think they realised at the time that a further lowering of the bed of the river was contemplated and that Richmond Bridge was in peril. When the agitation for the present lock works were in progress the Conservancy Board kindly allowed us to take a tracing of the plan.

As the Thames Conservancy were not in possession of funds to incur the vast outlay recommended for dredging a channel 100 feet wide, they proceeded to deepen the river in places where it was insufficient for navigation and form a narrower channel; but as soon as this was dredged the stream flowed into it, leaving larger foreshores exposed, and the natural dams of the river being partially cut through, the tide ebbed out quicker than before. When the river was deepened in one place the work seemed to be practically undone by dredging elsewhere.

In the meantime the memorialists had consulted Mr. Abernethy, who reported to them on June 5, 1873, that the best method of procuring an additional depth of water, particularly between Richmond Bridge and Teddington, and preventing the deposition of offensive mud on the shores and in the bed of the river was by the construction of a lock and weir.

As the depth of water continued to diminish from year to year, so dissatisfaction on the part of the riparian owners and those using the river became more pronounced, and on October 13, 1883, a public conference of the inhabitants of the neighbourhood took place at the Castle Hotel, Richmond. Several resolutions were passed, and amongst them the following:—"That the various attempts which have been made to improve the state of the river by dredging have not only failed, but made the condition of the river worse than before."

A committee was appointed with the Earl of Kilmorey as chairman, a subscription list opened and over 1,000*l.* quickly subscribed towards the expense of promoting a Bill in Parliament.

The result was a report and plan of a proposed weir and locks at Isleworth, put by Mr. Abernethy, and notice was given by the promoters, through their solicitors, Messrs. Bircham &

* From a paper by Mr. J. B. Hilditch, read at a meeting of the Society of Arts on the 10th inst. and published in the *Journal*.

Co., of their intention to bring in a Bill in the approaching session. Mr. Charles Burt, now mayor of Richmond, and our chairman this evening, made every effort to induce the Thames Conservancy to consider the scheme favourably and avoid a Parliamentary struggle, but it was to no purpose. They viewed the question chiefly in the light of the maintenance of the navigation, and could only support measures which were for the benefit of the river as a whole. It having been reported to them by eminent engineers that the vast interests of the port of London might be imperilled by the construction of any permanent weir or dam, it followed that the erection of such a work would be resisted.

When they were approached the answer returned was that they were willing and anxious to ameliorate the condition of things complained of as far as lay in their power, but they could not sanction one portion of the river being restored to the detriment of more important interests, and that the proper course of treatment to pursue in improving the river was by further dredging.

In the end they submitted certain plans, giving four sections of the river at different spots between Teddington and Richmond, and offered, on condition that the notice of the Bill was withdrawn, to spend a large sum of money in improving the river between Isleworth and Teddington Lock, by removing the shoals and mud, securing the banks with stone facings, &c.

A considerable portion of the amount subscribed was consumed in preliminary expenses, and the committee, having in view the large sum that would necessarily be expended in a Parliamentary contest, had no alternative open to them but to withdraw the Bill, and allow the Conservancy to proceed with their treatment of the river.

Although far from satisfied, some members thought they had succeeded in wresting some valuable concessions from the Board, which, if not all that was desired, at least held out the promise of some reward for their labours.

In this, however, they were greatly disappointed, for matters only continued to get worse. When a further loss of water was first noticed it was attributed to the dry season, and it was said that when a larger instalment of the scheme was carried out, depth of water would be obtained.

However, nothing of the kind took place; boats and barges kept grounding, and within a few weeks of the dredger being set to work between Rainshead and Isleworth ferries, the low-water level dropped nearly another foot. A considerable fall of water through the arch of Richmond Bridge now appeared, so that it was most difficult for any but an expert oarsman to row through the arches, and this state of things has continued ever since.

Mr. Abernethy's scheme first set me thinking about a half-tidal lock and weir, and, looking over some old newspaper cuttings, I find I suggested, in a letter to the local paper in October 1883, a weir which, whilst holding up the water, should allow the stream to pass on the level of the bed of the river, and only be operative during the period of low-water, and this is exactly what the Richmond sluices are designed to effect.

In consequence of my having called the attention of the Richmond Vestry to the diminishing level of the water and exposure of the foreshores, as a consequence of attempting to carry out the further dredging of a channel in the bed of a river, which seemed to threaten most serious results to all concerned if further proceeded with, a number of gentlemen, who had supported Mr. Abernethy's scheme, met at my house on July 18, 1884, to consider what had best be done.

Although these proceedings were complained of, and termed irregular by the Conservancy Board, who continued to prosecute the works they had undertaken, and ultimately spent 23,500*l.* upon them, it really proved the initiative step to a reversal of the policy pursued so many years to the detriment of the neighbourhood.

Up to this time a somewhat jealous feeling had existed between the Twickenham Local Board and the Richmond Vestry. Twickenham had on more than one occasion acted independently, but now the extreme sufferings of both called forth a determination to work together. The condition of the river then had become so desperate that the channel between the town and the large flat, known as Eel Pie Island, dried up at low-water. The watermen could not get to their boats, and to call attention to their miserable plight, took to playing a game of cricket one afternoon in the bed of the river.

The various appeals to the Thames Conservancy were always very courteously but firmly replied to, and held out no hope whatever of the state of things, which became very bad in the summer of 1884, being ameliorated.

About this time a joint committee, consisting of six members of the Twickenham Local Board and six of the Richmond Vestry, was appointed to confer together and endeavour to bring pressure to bear upon the authorities.

A Royal Commission was suggested, but this, it was found, would be most difficult to obtain for such a small section as three or four miles of the river. An appeal was made to the

Board of Trade, and eventually in 1888 it was arranged that an inquiry should take place before an arbitrator. In order to meet expenses another appeal was successfully made by Mr. Charles Burt, the chairman of the Richmond Vestry, and Mr. Charles Thrupp, chairman of the Twickenham Local Board, who, together with myself as chairman of the joint committee, composed an executive committee, and the campaign was opened.

Mr. Wolfe Barry, M.Inst.C.E., was appointed, and the evidence being prepared to lay before him, when the whole scheme collapsed owing to a stipulation being made that before proceedings were commenced the complainants should deposit 1,500*l.* to guarantee their portion of the cost of the inquiry.

This sum being so much more than was anticipated, and there being no certainty that if the promoters obtained a decision in their favour any immediate relief would follow, the idea had to be abandoned, and attention was again given to the promotion of a Bill in Parliament, which it was thought, even if more costly, would carry with it definite powers to construct works for relief. To proceed on these lines with any chance of success, it was first of all necessary to provide a scheme that would command the confidence and support of able engineers.

All this time I had been studying and making notes of the condition of the river and I had taken many photographs, showing the extent to which the bed of the river was exposed at low water.

Being convinced in my own mind of the strength of some of the arguments used in opposition to the erection of an ordinary fixed weir of solid construction, I turned my attention to movable ones, and, in the autumn of 1877, examined several of the Continental systems on the Seine, the Yonne and the Marne. I returned very much impressed with the magnitude and importance of these works, and feeling that we were very much behindhand in schemes for impounding water at home. At the same time the conditions and objects aimed at were quite different. Being above tidal influence they were all designed to maintain a navigable depth of water in dry seasons and prevent flooding in wet ones, and only required erecting and removing when these changes occurred; whereas, in the case of the Thames at Richmond, a change of level took place with the tide twice in twenty-four hours.

In most cases the erection of the dams (or barrages, as they are called) is slow and tedious, and their removal almost equally so. To provide for the rise of the tide it was absolutely necessary to have some scheme that could be completely and readily manipulated in the shortest possible time.

The needle weir and the chanoine wicket, the most largely adopted systems, were exceedingly slow in removal.

The curtain-dam of M. Camère, at Poses, on the Seine, which is considered a magnificent work of its kind and was holding up 13 feet 6 inches of water when I was there, did not possess features that could be readily adopted. The curtains, which somewhat resemble wooden revolving shutters, occupied fifteen minutes in rolling up, and the iron frames upon which they worked, suspended from a footbridge above, took twenty minutes in raising and ten minutes in lowering.

The hydraulic weir of M. Girard and the drum weir of M. Defontaine were the only ones that met the requirement of speedy removal successfully, but they were both expensive systems. I was much struck with the latter, which consists of a succession of balanced paddles, the lower halves being recessed into the bed of the river. By turning a valve the head of water maintained causes the paddles to lie flat on the bed of the river, and the weir disappears. When in operation the evenness of the fall of water was very perfect, almost resembling a glass shade, and looking down the river one witnessed the curious effect of two different levels of water, without any apparent cause. The objection to this system was that with tidal action deposit might take place in the drum and stop its working effectually, and it seemed to me very objectionable to have working parts in the bed of the river, where they were difficult of access.

More than one adaptation of these schemes had to be laid aside with disappointment, and a plan of tidal gates, after occupying much thought and consideration, at length gave place to Mr. Stoney's sluices. The drawings of these interested me very much from the first, but there was no example to be seen in England. It happened that Mr. Stoney had been occupied in obtaining a prolongation of his patent, and a friend of mine, who had advised him, introduced me to him and also to Messrs. Ransomes & Rapier, of Ipswich, who were interested in working the invention.

About this time the Manchester Ship Canal scheme was making progress, and the conditions met with here more closely resembled those of the Thames at Richmond, on account of the lower portion of the canal being subject to tidal influence. Mr. Stoney's sluices were entertained for regulating the control and discharge of the river Weaver. Mr. Leader Williams and other engineers were about to visit Ireland, where the nearest examples could be seen in operation, and I was invited to join the party. We first visited Ballinasloe, county Galway, and

afterwards proceeded to view larger sluices, of 30 feet span, at Belleek, county Sligo. One could not be otherwise than impressed with the facility with which huge gates of this width, 14 feet in depth and bearing a static pressure of 85 tons—due to the head of water maintained—were readily moved by hand; but, of course, what was visible above the water-line of such a solid erection had not the most pleasing appearance, and was not of a nature that we could propose to introduce into the residential neighbourhood of Richmond.

As a bridge was not required, and would probably have been opposed at the sites that had always been considered the most suitable for the erection of a lock and weir of the usual type, the cost of the footbridge necessary for the working of Mr. Stoney's sluices was one of the objections to the scheme, and remained so for some time. At last, one day it came into my mind that if we had the courage to adopt the present site for the scheme, the bridge would be of great service in affording improved communication with Isleworth and St. Margaret's, where only ferries existed, and there being a highway on the Middlesex side, the objections of the landowners would not be encountered, and no compensation demanded. Moreover, the river here was broad and its course straight, which the scheme required on account of the scour of the sluices when shut, and the passage of the river traffic when open.

After making these suggestions to Mr. Burt and Mr. Thrupp a meeting of the committee and several engineers again took place at my house, to view the site and decide upon a scheme. The difficulty that remained was the unsightliness of the sluices when not in use. I had suggested turning them over, and lowering them into a recess in the bed of the river, to which, however, there were objections, when a member of the committee asked if they could not be turned up instead. To this Mr. Stoney replied that he had thought of a plan which would enable him to tuck them up under the arches of the bridge, so that they would be out of sight. His suggestion and method of carrying it out met with the approval of all present, and before the meeting terminated the problem was considered solved. With his ready resource Mr. Stoney overcame difficulty after difficulty as they presented themselves, and soon produced a very practical scheme, of which an excellent working model was made.

I shall not be able to dwell at length on the Parliamentary proceedings, which, under the skilful guidance of Mr. Charles Burt, who I have personally to thank for presiding here this evening, were admirably carried through to a successful issue. Only those connected with the promotion of the scheme know the amount of energy, labour and thought he brought to bear upon the subject, and there can be no doubt that to his ability and knowledge of Parliamentary procedure was due the passing of the Bill. There were no less than fifteen petitions lodged against the Bill in the House of Commons, and the evidence was so voluminous that it occupied ten days, whilst there were nine petitions against it in the House of Lords, which took up the best part of six days.

I ought to mention that Mr. Thrupp suggested that the local authorities should be made the promoters of the Bill, and the consent of the ratepayers having been obtained, under the Borough Funds Act, in Richmond by an overwhelming majority, and in Twickenham by a very substantial majority, the Bill went forward with the full sanction of these parishes.

The Heston and Isleworth Local Board held a meeting for the purpose of opposing the Bill with the ratepayers' money, because Isleworth was disappointed that the site selected was situated above the town; but the vote of the residents of St. Margaret's, a small portion of the district benefited, was solid enough to decide the question in favour of the scheme. The estimated cost of the works was 40,000*l.*, and this sum was fixed by the Act to be contributed by the districts rated.

As soon as the Royal Assent was obtained on August 14, 1890, the Thames Conservancy Board met to consider the provisions of the Act, which provided that, if they were unwilling to accept the construction of the works themselves within a period of six months, the local authorities would become empowered to undertake them. Within the time specified they intimated their acceptance of the responsibility, and proceeded to purchase plant and make provision for the construction of the works.

Mr. More, the engineer of the Conservancy Board, promptly took in hand the working drawings, and suggested improvements in the design of the footbridge and an enlargement of the lock, which considerably enhanced the estimated cost of the work. It took a considerable time to erect landing stages, cranes, &c., the first pile being driven on July 1, 1891. The concrete foundation of the first pier was put in on March 25, 1892, and the works have proceeded steadily ever since under the able superintendence of Mr. Le Neve Foster, the engineer in charge.

The abutments and piers of the bridge are built of Staffordshire blue bricks faced with Cornish granite. The lock is to be 250 feet long and the gates give a clear opening of 26 feet, but to accommodate a tug and full complement of barges the lock widens out on the shore side to 37 feet for about two-

thirds of its length. The work in this section is from five-eighths to three-fourths finished.

The whole of the bed of the river is laid bare in sections between the foundations of the piers by means of half-tide coffer-dams, which have to be pumped out for each day's working. A wide and deep concrete apron is formed between the rows of sheet piling on either side, which are driven deep down into the bed of the river, and in the centre is laid a granite sill, on which the sluices would rest if they were let down to their fullest extent; but, as I shall presently explain, they are suspended by counterbalance weights, and kept floating by the head of water, maintained just sufficiently to allow all the stream that comes over Teddington Weir to pass underneath. When first brought before the Committee of the House of Commons, the design of the bridge had seven arches of 40 feet span, five of which were to be fitted with sluices, whilst the side arch on the Middlesex side was to be fitted with rollers, as a slipway for pleasure-boats, and the lock built under the arch on the Surrey side.

The largest sluices that had been made were 30 feet span, and Mr. Stoney was afraid to propose a much wider span in case he might be thought to be too bold, although fully convinced in his own mind how much simpler the scheme would be with fewer spans.

Opposition evidence having been brought to show that it was now the modern course of engineering to increase the spans of bridges as much as possible, Mr. Stoney at once offered to increase the width of the sluices, and reduce the number of spans over the stream to three, and the plans were so altered when taken before the House of Lords.

I will now describe the mechanical part of the structure, which has been constructed at Messrs. Ransomes & Rapier's works, Ipswich, where the sluices for the Manchester Ship Canal were also made.

The three spans over the river are actually 66 feet wide, the side arches over the lock and slipway 50 feet each, and the clear headway under each is 1 foot more than at the Richmond railway bridge.

The sluices which fill the spans are made entirely of steel, with the exception of the end-bearings and the trunnions upon which they turn from the vertical to the horizontal position when raised out of sight. The sluices are 12 feet deep, and each weighs 32 tons, being suspended at each end by four steel-wire ropes 1 inch in diameter. The steel-wire ropes pass over pulleys attached to the lifting-gear, and to the other ends of these are attached the counterbalance weights. There are four, of 8 tons each, suspended in 3 feet square wells made of steel plates built in the masonry, and recessed one on either side of the end of each sluice, two wire ropes being connected to each. The steel wells also serve to support the guides and bearers, which are planed surfaces of cast-iron, between which and the bearers of the sluice are interposed Mr. Stoney's patent rollers, which will receive the static pressure of the water when it is impounded. There is a set provided on either side, so that no matter whether the stream is flowing up or down the friction from the pressure which would otherwise result is almost entirely eliminated. The rollers are suspended independently with counterbalance weights of their own, and travel slower than the sluice, having less distance to cover, and are always ready to take the strain when the sluice descends to the point at which they stop.

The counterbalancing of the sluices is so perfectly adjusted that the buoyancy of a balk of timber running along the top of the up-river side of each sluice is sufficient to float it, and cause it to ascend with the rising of the tide. When the scheme is in operation, it will regulate automatically the flow of the stream under the sluices at low water, and maintain a nearly fixed level after the period of half-tide is reached and the sluices have been lowered. In addition to the large counter-balance weights there is a link-chain arrangement on either side carrying small weights, which provides for the adjustment and difference in weight of the sluice in and out of the water and according to the extent to which it is submerged. The turning of the sluice from its vertical to the horizontal position is accomplished by means of a wrought-iron arm projecting from one end of the sluice carrying a small pulley, which travels in a curved guide on the upper side of the pier of the bridge.

The lifting gear is similar on either side, motion being imparted to the pulleys over which the suspending wire ropes pass in the usual manner. The windlass is only attached to one set of gear, and, in order that they should work quite simultaneously, the power is conveyed by means of a 5-inch shaft and spur gearing from one side of the arch to the other.

On the land pier of the bridge, on the Surrey side, accommodation will be provided for the lock-keeper and his assistants, and similar rooms will be built for the toll-collector on the other side, near the slipway. Being arranged under the staircases leading to the foot-bridge, they will not be much seen, and have rather a good effect in giving solidity to the land arches.

The Act provides that the sluices shall be worked so as to hold up the water of the river above the bridge to as nearly as may be 5 feet 9 inches below Trinity high-water mark.

The sluice usually occupies about three minutes in lifting when worked by two men, but it can be done in much less time with quick gear, and it is very interesting to see such a huge mass of metal (probably the largest in bulk if not the heaviest that has ever been lifted in a similar manner) gradually rise out of the water in which it was previously suspended floating, and after closing the 66-feet opening of the arch, and eclipsing the view of the landscape for a time, disappear above the arch, leaving the river as free as if it only were spanned by an ordinary bridge.

VALUATION OF PROPERTY.*

IN this paper I do not propose to deal in any way with such valuations as those of large estates, land allotments or valuations made for rating purposes, but solely with those which an architect's practice brings him in contact with, such as residential or business premises, whether for personal use, for investment, for mortgage, for the settlement of disputed accounts, for progress certificates, for building society work or for dilapidations. All require a somewhat long practical and perhaps tedious apprenticeship, with a good deal of common-sense judgment thrown in. It is to be regretted that the practice of employing a competent architect to inspect, report upon and value premises before purchase is of such rare occurrence, for I am certain it would be the means of saving much after dissatisfaction, and many vain regrets were this the rule and not the exception. How often do we hear a client say, "I have purchased such and such a house or property, and I want you to come down and look at it." Then, when the practised eye discovers this and that defect, which requires often immediate remedy, and finds that a good deal of money has yet to be laid out to make things satisfactory, there is grumbling and irritability and it is almost invariably an unpleasant job. The first thing to be thought of is the suitability of the site for the class of building, whether for personal residence or for letting purposes. A residence quite proper for one district would be quite out of place and of far less value in another, though the actual cost may have been the same. Next as to its sanitary suitability, and this in new suburbs is a serious matter—whether it is liable to be annoyed, and not only annoyed, but injured by a neighbour's or prospective neighbour's drainage, and also if its own drainage can be satisfactorily disposed of. The building then as a structure must be carefully examined, noting those defects that are only of a temporary nature and making an item of the cost of reinstating. Look carefully for any signs of damp, not only internally but externally, for I have known houses patched up for sale as artfully as a spavined, broken-winded horse for the yards; neat little dados hiding the bulged and blackened paper, plenty of stain and varnish used, portions of the rotten floors removed, and any amount of tricks to salve over for the time the sore beneath. If signs of dampness are found no trouble should be spared to find its cause. It may only be caused by some easily remedied defect, or as is most often the case, by inherent bad construction, bad bricks or want of a damp-course. Then of course would have to be taken into account the probable cost of the remedy, which as a rule would in the case of small properties stop the transaction and save your client worry, time and money. The age of the building must be taken into consideration and an allowance made for depreciation. In this matter judgment forms a large item, for take a dozen properties of the same class and age, they will all differ to a certain extent, according to the care which has been taken of them by their respective tenants or owners. This is particularly the case in wood buildings, as being so much more liable to injury and decay and whose term of life is short. Now measure the building and price it as new according to its class, and make the deductions as before mentioned. The land value must be then added, of which I will speak more particularly when touching upon building society work.

The same routine should be gone through for purchase as for investment, care being taken to remember to deduct from the rental value those many incidentals which mount up to a considerable item, such as percentage for collection, rates, insurance, unexpected demands by local boards, the eccentricities of the Board of Health, the sewerage and water rates if in the metropolis, the cost of roads and right of ways in suburbs if not taken over by the council, and periodical painting, repairs, &c. Do not be led away by what a place may be let for. Rents in the past have been far too high, and it was only a matter of time when they would in the natural course of events come down; but again a great deal of property is at the present time either unlet or let at rentals which are most inadequate to

the cost—cottages at 1s. per week, and residences dropped from 150l. per annum to 70l. and 80l. cannot be said to be fair criterions, and again the practical judgment of the valuer must come in. A class of property which is very unstable is one that has been created by some factory, more especially if in suburbs or away from town, for in case of the failure of the works the population, having nothing to fall back upon, migrate to some other spot, the houses being left tenantless. This can be seen clearly illustrated at the present time by a look round any of our outside and formerly busy brickworks.

In inspecting for mortgage, especially for short terms, so much minuteness is not necessary, but the main points have to be quite as carefully studied, for in most cases the moneys lent upon mortgage are either trust moneys or practically so. Again, I would impress the care to be exercised in dealing with the rentals. They are frequently put up for the purpose of mortgage and the tenants allowed a drawback. I have known this done by people who would be grossly insulted if called swindlers, but it is certainly sailing very close to the wind. A point in mortgage matters which is very frequent at home, but very seldom comes into calculation here, is in connection with leasehold properties. As the practice of granting building leases is increasing in Australia, and will increase in greater proportion in time, I may as well mention it, *i.e.* the length of the remainder of the lease. A careful mortgagee will call in his mortgage on leasehold property on the remainder reaching between twenty-five and twenty years, *i.e.* by the "remainder" I mean the length of time the lease has to run before it terminates, and this shows the absurdity of building leases of thirty or forty years only if anything like substantial building is required. One year's peppercorn and 99 years' lease is the usual at home, the City of London Corporation giving eighty years. In large city buildings used for office purposes great care and discrimination must be used, as it is most usual for money to be borrowed for these on the assumed rentals marked on the plans before the building is erected, and I leave it to you to imagine the position of a mortgagee at the present time lending up to three-fourths on the values put on a block of offices five years ago. Warehouse and factory property must have taken into account its risk of fire and damage in accordance with what it is used for. And all properties must have the question of fire seen to.

The way in which building society work has to be done is to my mind the most unsatisfactory of any. A so-called plan and specification are sent to the surveyor with a sketch of the position of the land and the form of application. The plans are, as a rule, rough attempts by a mechanic without any knowledge of drawing; in many cases are only in pencil, worked off with a 2-foot rule, indicating neither construction nor detail. The specification merely enlightens him whether it is intended to build in brick or wood, with just a few general clauses, seemingly remembered from hearing some specification read, but with no detail. From this unsatisfactory basis you have to state the value of the building when erected. Then you proceed to identify the ground, and on the "boom" estates this was often a matter of some difficulty, as auctioneers seem to have the most peculiar ideas with respect to distances from railway stations. When the estate was at last reached a plough track through a paddock was the only indication of "The Grand Avenue," "Hopetoun Parade," or some equally pretentious name. However, the block adjoining had sold for 8l. a foot, the next at 9l., &c.; and as your instructions are the present price, down it must go at 7l. or 8l. You must not use your judgment, and say "this is not the class of house for such priced land" or "the price is absurd;" nor are you called in to advise the directors in the matter, but simply to put the plan of position of property upon the form, to fill in the present price of the land and the presumed cost of the house, to get your fee, which as a rule is most inadequate, and then the first performance is over. You may not come upon the scene again; if you do, it is for the progress payments. Here you are handicapped again, for you have nothing to tell you if this man is carrying out what he proposed to do with the society, and you must value what he has done and just send in a memorandum of the amount. If you do your duty here, there is no end of grumbling to put up with and often abuse. In progress payments of this description, even greater care should be exercised than in those of proper contracts for buildings, for you have no hold on your man; as a rule he is a jerry speculating builder, and also as a rule the society have agreed to lend him more than they ought, and the sooner he can get hold of the money the better for him. He tells you pretty straight the amount he expects, and I regret to say we have generally differed on the subject. The advances should be kept very low until the building is covered in and protected, the gutters and down pipes fixed, and generally in such a state that should circumstances arise preventing the completion for a time the structure would not be damaged. Always bear in mind to keep a good margin back to be able to complete, if so compelled, without loss, and not losing sight of the fact also that all fees, legal charges and the society charges, interest

* A paper read before the Victorian Architectural and Engineering Association by Mr. G. V. Blackburne, and published in the *Australasian Builder*.

and often fines have to be thought of in this class of work. I am perfectly certain that had our building societies insisted on proper plans and specifications and employed proper surveyors who knew some of the troubles of this kind of work, and especially had they let them have copies of the drawings of all works to be inspected, they would, instead of being, as they are now, in a state of either insolvency or collapse, have been flourishing and doing good work. There is also just one more point before I leave the building society. My experience has been that an honest, straight man, who requires the aid of a building society in its presumably legitimate business, either gets no reasonable offer or has no end of worries and obstacles placed in his way, while the speculator has not the slightest difficulty, and sails away to his haven of rest, often leaving the society with a white elephant at the finish. In progress certificates in contract work the routine is much the same, but while there are not the same contingencies to provide for, others often crop up. For instance, though it may seem a little bit hard to say that if a contract is taken very low, less money than usual should be certified at first and even afterwards, an extra margin should be seen in case your job should happen to be the last straw and you are left in that most unpleasant of positions of having an unfinished building on hand. In large buildings, as a rule, you have the quantities to go by. These, of course, are an immense help and safeguard, but here again is a little dodge to be watched, for they are often so priced as to procure for the contractor a far larger proportion of the earlier works than on the values of the finishing trades. I may seem to have insinuated some rather hard things about contractors, but where I am pointing out warnings to my younger brethren, it is not in respect to the honourable and straightforward contractors, of whom I am glad to say my experience has been that they compose the large majority, but it is also my experience in about twenty-five years of hard and varied work that there are some who certainly cannot be classed among those. It is therefore necessary to know how one might be got at in case of having the misfortune to be associated with one of the latter description.

The first certificate should never be given until you are perfectly satisfied as to the thorough completeness of the works and all accounts have been properly adjusted. Though you may be protected by the maintenance clause, it is always an unpleasant and unsatisfactory matter for all parties if the buildings have to be entered upon again for the purpose of putting something right. It often happens that the proper adjustment of accounts is not such a simple matter, and a great difference of opinion is frequently found between the interested parties, leading as a rule to law. It is simply astounding the way in which people rush off to their lawyer with technical accounts, more especially in connection with buildings, wasting time, money and temper on lawyers and barristers, who make the most awful jumbles of the matter if not properly coached by an architect, and which would be amusing were it not for the disastrous and often unfair results. If referred to some known practical architect, the whole thing could be settled for a twentieth part of the cost, and certainly on a reasonable basis. Should you be placed in the position of an arbitrator in a matter of disputed work and accounts, always, if possible, go and see the work yourself. Do not be satisfied with the mere evidence. Take a cupboard front, for instance. One side says it is only a cupboard front, just panelled and moulded, and of such a size. That sounds simple enough. The other side admits the size, and to a certain extent the description, but says the mouldings were peculiar, entailing more labour, &c. The thing sounds nothing on the face of it; but perhaps if you see it you will find the panels are odd shapes, the mouldings special-struck or handworked, and generally the whole quite out of the common, and the contractor has really only charged a fair price. This is a very simple illustration, which could be expanded *ad lib.* It is once more the practice and experience that has to be brought to bear in valuing for fair prices, for the reading of the specification will often here come into account as to how far the contractor should reasonably have understood the amount of work required, or how deficient the architect has been in properly expressing his meanings. Specifications are not always perfect.

Valuing for dilapidations is not a matter which troubles us much here at present, but, like the leaseholds, will come in time, though I do not suppose even the youngest of our members will have the same experience as myself once in London, where I made a survey on the expiration of a 300 years' lease. The work of arriving at values of dilapidations has been the source of endless litigation, the practical part of the architect being so hedged about with the technicalities of the law. The age of the building, the length of the lease, the state on entry, the question as to what is "ordinary wear and tear" and a hundred and one quibbles and points meet the surveyor. But I am glad to say light is now rapidly getting let into this heretofore fearfully complex matter, and some of the judges have lately very clearly placed the law before us. Blackstone defines waste as "spoil or destruction to houses,

gardens or trees or other corporeal hereditaments, to the injury of the reversion or inheritance." And waste may be taken under two heads, viz. "commissive" or "permissive," and the terms speak for themselves, commissive being injury personally done by the tenant or others, and permissive injury permitted to be done by neglect, such as allowing a leak to continue to the injury of the premises or such like. Grady also is an authority on this subject. There should always be a proper schedule and report drawn up by a surveyor as to the state of premises at the time of a tenant's entry. This would save a great deal of the unpleasantness often engendered at the termination of a lease. The great question of "tenantable repair" was fought out in the case *Crawford v. Newton*, when Mr. Justice Cave gave judgment in respect to the dilapidations, and very clearly laid down the works which could and those which could not reasonably be required. This case was appealed against, and the Master of the Rolls upheld and confirmed the learned judge's definitions—that a tenant was not liable to paper and paint, and leave the house in the same condition as when he took it, and took exception to the following articles in the schedule:—Wash, prepare and distemper ceilings and cornices, strip walls, stop, prepare and repaper, prepare and paint woodwork three coats. The Master of the Rolls held this was "decorative" not "tenantable" work. Mr. Justice Cave again, in the case of *Proudfoot v. Hart*, in the Divisional Court, after the referee had stated that papering, &c., had to be done again, clearly laid down the difference between "ordinary wear and tear" and permissive damage, especially in regard to a floor, which was one of the subjects of the dispute. Here, he said, the tenant was bound to repair as long as repair was possible; but when it got to such a state that patching up was no good, the tenant could not be called upon to put up a new one. He also, again, but more minutely, went over the other repairs, with the same views as given in the former case. This case was taken to the Court of Appeal, and Lord Esher practically confirmed the finding of the Court below, but would also give discretion; for he here says in respect to dilapidations almost precisely what I have said before in this paper as to value of residences, *i.e.* what would be quite right and proper for Grosvenor Square would be out of place in Spitalfields. Take Toorak and Collingwood in lieu of the other names, and you have a simile. There are still many points which have not been cleared up, because so much depends on the wording of the maintenance clauses of a lease. Great disputes are constantly occurring in reference to drainage when called upon by some local body to alter or redrain, also as to the making of roads and footpaths; but the authorities go to prove that the tenant cannot be charged with these items. In this paper I have tried to give our younger members some idea of the proper lines to work upon in the different class of valuing work that comes within the scope of our professions. The detail of making up these valuations depends so greatly on circumstances surrounding the different cases that it would scarcely come within the scope of this paper. To my older brethren I am afraid I have been tedious, as so much of it must be all stale news to them, but still I hope I may have been able to touch upon some point that has even interested them.

CONSTRUCTIONAL WORK IN IRON AND STEEL.

THERE are so many trade catalogues which are put together without discrimination it is no wonder the majority of architects treat all examples of that class of production with indifference. The first step in preparing a catalogue should be to consider what architects really wish to know about the particular class of goods, and in the next place efforts should be made to supply that information in a trustworthy form. Messrs. Moreland & Son, of Old Street, E.C., have just issued a catalogue (we suppose we must apply that name to it) which is a model of what is required. The pages make no attempt to be exhaustive of all that is done in their workshops, or is visible in their warehouses. That would be too onerous a study, however useful it might be made. Messrs. Moreland & Son simply present a few types of the structures they have carried out (and which are more suggestive of what is feasible than the speculations in many books on construction) with some results of their own tests on steel columns and stanchions, English rivetted steel girders, rolled steel joists, steel channel girders, &c. It will be said by those who take only a superficial glance at the pages that rows of figures and sections of girders and rolled joists have already appeared in wearisome iteration. Indeed, it requires no great theoretical or practical knowledge to work out such "information." What Messrs. Moreland & Son furnish is of a different kind. They do not say these forms exemplify the utmost that can be done in girder-making, or here are the weights which such a section of beam should sustain. All they claim is that they have produced girders which were required to meet novel difficulties

and that their girders have answered the requirements efficiently. The beams and joists could no doubt be proved to be capable of sustaining greater loads than are recorded. Messrs. Moreland & Son merely put on record the safe loads which they can guarantee. There is no puff; figures and diagrams unaided have to become convincing to the initiated. This plan may be unusual, but it should be remembered that Messrs. Moreland & Son are not agents but engineers. As they believe in the eloquence of sound construction, it is natural they should assume that architects and builders would look at things in a similar aspect.

We refer the reader to the tables for information about loads on girders and joists of various sections. It will be evident from them that there is economy to an important extent in the use of steel girders.

The examples of construction in steel are varied, and all are interesting. A very light and graceful dome, 36 feet span, at St. Joseph's Church, Highgate, is made of light steel ribs, abutting against a steel ring at apex, and at base bolted to brickwork. The covering is of copper plates. It is effective, and imposes only compression on the walls. There are several roofs. One, in the hall of the Mark Masons, Little Queen Street, has a clear span of 41 feet 9 inches. The form was determined by the necessity of non-interference with ancient lights and a respect for a ceiling, and had to be kept low. Strains on the walls are avoided by resting the principals on slight ribs, which are brought down just below floor line, and are tied by the girders which carry the floor. This is an ingenious arrangement, and from the absence of cumbrous forms it is well adapted to meet many difficulties in connection with town buildings. Truss girders up to 60 feet span, to carry superstructures, are next introduced. A roof is shown which is in the Battersea Town Hall. The span is 56 feet. The principals, which are 11 feet apart, are light, and the tie-rods correspond with the curve of the ceiling. The polygonal roof for Hengler's Circus consists of sixteen trusses, meeting as a centre-piece at a ventilator 6 feet diameter, constructed of steel plates, which serves as an abutment, and also carries the sun-burner. The curved principals of the Newport Market, which are 60 feet span, are carried to the ground, and the use of columns is avoided. In that, as in several other cases, the roofs can be erected without the aid of scaffolding. Examples of Mansard roofs, trusses with joists for floor serving as tie-beams, and simple roofs are given.

Another division of the catalogue exemplifies fireproof doors and shutters, as well as steel flooring formed of trough-girders, which is especially well adapted for carrying pipes, &c., for heating, ventilation and lighting. Altogether the catalogue of Messrs. Moreland & Son has merits enough to justify its preservation, and it will be found a very suggestive guide to every one who is concerned in the employment of steel or iron, in columns, stanchions, girders, roofing and flooring.

THE GREY FRIARS' CHURCH, CARDIFF.

ALTHOUGH it is the fashion to call Cardiff a modern town, says the *Western Mail*, its history, military and ecclesiastical, is ancient. The first syllable of the name takes us infallibly back to pre-Roman times, and there is evidence that when the conquering legions fought their way to Cardiff they found it a fairly considerable centre. Laying through its midst one of their grand roads, they passed away, and by-and-by other conquerors came and reared a grim castle, whose halls must have echoed with many a Norman jest, and whose dungeons bore witness to the moans of those whose greatest crime was fidelity to Fatherland. With the building of the castle came men carrying the cross—holy men who went about doing good, and who built fair churches and religious houses and endeared themselves to the people, and kept alive in olden Cardiff the flickering flame of religion. Years passed, disaster and decay told their inevitable tale, and the spoliations of a certain Henry, the eighth of his line, completed the havoc. The religious houses vanished, St. Mary's—that fair edifice—followed, and only St. John remains, sharing with the castle the burden of years, and telling to the busy denizens of to-day the strange story of the silent past.

Some such reflections as these passed through the mind of one of our representatives, who, acting upon information which had reached us, sought and fell into conversation with Mr. Fowler (of Messrs. Kempson & Fowler), a gentleman who has been conducting archæological investigations for some time under the direction of the Marquis of Bute. Reference was made to the excavations commenced some twelve months back in the gardens of the castle east of the North Road, and soon our correspondent found he had come across Mr. Fowler at an exceptionally opportune moment. In fact, that gentleman was rejoicing in spirit over the discovery—the rich reward of his patient investigations—of the site of the house of the Grey Friars.

Five centuries ago two small houses were founded at Cardiff—one, the Black Friars, by Richard de Clare, "without the west gate"; the other, the Grey Friars, "without the north gate," by Gilbert de Clare, son of the nobleman already mentioned. There is also reason to believe that a Priory of Benedictines existed in the town. The site of the Black Friars (within the castle grounds on the borders of the Taff) has been cleared by the Marquis and preserved for future generations; but the exact position of the Grey Friars was, till a day or two ago, a mystery; hence the quiet enthusiasm of Mr. Fowler, whom we very heartily congratulate. On Speed's quaint plan of Cardiff, drawn up three centuries ago, the Black Friars is distinctly marked, but there is no trace of the companion house, though a residence of considerable pretensions appears, perhaps the mansion of the Herberts. Prior to the building of the latter the dissolution of the monasteries had taken place, and the only use to which the Grey Friars remained to be put was the contribution of its hallowed stones to build the mansion of the Herberts and the tiny houses which did duty for the Cardiff of that day.

The excavations of Mr. Fowler, at the instance of Lord Bute, were commenced some twelve months ago in the immediate vicinity of the Herbert ruins. But though the domestic part of the Grey Friars was then laid bare, not a trace of the church appeared, and the excavators were about giving up in despair when their perseverance was rewarded by the unearthing of several arcade piers and other fragments, which left no doubt whatever of the scene of operations being the site of a thirteenth or fourteenth century church, of greater magnitude than the present fabric of St. John's. We must congratulate Mr. Fowler (who is following up the discovery we have outlined) on the happy outcome of his exertions, and townsmen, too, will feel that they owe a debt of gratitude to the Marquis, whose enlightened munificence has made possible one of the most interesting and important discoveries of late years in the neighbourhood of Cardiff.

THE END OF THE ARCHITECTURAL PUBLICATION SOCIETY.

A GENERAL meeting of subscribers to the Architectural Publication Society was held on the 11th inst., Mr. T. Hayter Lewis (honorary treasurer) in the chair.

The secretary read the advertisement convening the meeting, and the minutes of the last meeting, on April 30, 1888, were read and confirmed. The report, of which we have already given an abstract, was presented to the meeting.

On the motion of the Chairman, seconded by Mr. J. T. Christopher, the report was received and adopted.

Mr. Cates stated that he had had several applications from gentlemen to buy up remainders, but in view of the distinct pledge given by the committee not to at any time allow the issue of copies at less than the original subscription price, in order to guarantee the subscribers against any depreciation in value by a remainder being thrown upon the market, he had been unable to accede to any of the applications.

After some discussion as to different libraries to which it would be desirable to present copies of the Dictionary, it was moved from the chair, seconded by Mr. Hansard, and carried unanimously: "That the honorary secretary be requested to take charge of remaining stock to supply such demands for complete copies as may be made within twelve months from this day; and if any should then remain unappropriated to present them as follows:—(1) To the Royal Institute of British Architects; (2) to the Imperial Institute Library; (3) to the British Museum; (4) to the Royal Institution; and others at the discretion of the honorary treasurer and honorary secretary and Mr. Papworth."

The next resolution, moved from the chair, and seconded by Mr. Wyatt Papworth, was as follows:—"That, after the lapse of twelve months, the honorary secretary be authorised to exercise his discretion as to parting with or destroying the remaining stock of odd parts, and that the numerous wood blocks be offered to the Royal Institute of British Architects, and, if not accepted by them, be also destroyed."

The Chairman then announced that when the stock was finally disposed of it was anticipated that there would be a balance of about 160*l.* unappropriated. He reminded the meeting that at the date of their last meeting, in April 1888, the audited statement of accounts showed that the balance available at that time to meet the current expenses was 99*l.* 8*s.* 3*d.*, a result which had only been attained by an act of self-sacrifice on the part of Mr. Wyatt Papworth. When the production of the Dictionary was resumed, it was arranged that the remuneration to be paid to Mr. Papworth for his labour should be at the rate of 1*l.* 11*s.* 6*d.* for each printed page of the Dictionary; but after some progress had been made with the letter P, it was found that if the funds in hand were to be made sufficient to carry on the work to the end of the letter S, that already inadequate remuneration should be reduced

to the still smaller sum of one guinea per printed page. Mr. Papworth, in his earnest desire to see this great work, which originated with him; and which has occupied so much of his active life, brought to a satisfactory conclusion, generously offered to devote himself and his collections to the bringing out of the remaining letters, and to accept the like utterly inadequate payment for his services. He desired, therefore, to move from the chair, "That, as it appears from the report that there will remain an unappropriated balance of about 160%, it is hereby agreed that 100% of that balance be presented to Wyatt Papworth, Esq., as a small recognition of the self-sacrifice which he has made in carrying out the work of the Dictionary as specially noted by the committee in their report of April 27, 1888." He further stated that the only other suggestion for the appropriation of the balance that had been received by the committee was to the effect that it should be expended in reprinting the "detached essays" with their plates and the plates published 1848-52 in anticipation of the Dictionary; but inasmuch as the balance of 160% would not in any way suffice for that purpose, he thought it better not to formally put the proposition before them.

Mr. Rowe seconded the resolution, which was carried unanimously.

The Chairman then stated that while Mr. Papworth's active co-operation had been indispensable, it was also beyond question that the work never could have been carried through with Mr. Papworth or without him, had it not been for the energetic co-operation of the honorary secretary, Mr. Arthur Cates. From first to last he had made up his mind that the work should be a success, and when in 1888 there was a question as to whether subscriptions would come in and the funds would be sufficient, Mr. Cates had offered to guarantee its completion. In Mr. Cates's presence he did not like to say all he felt, but he warmly commended to the meeting the following resolution, of which he was sure they would heartily approve:—"That so much of the balance of about 63% as can be safely employed, after allowance for possible expenses, be made over to a committee, with power to appropriate the said balance in such mode as they may find most agreeable to Mr. Cates in recognition of the very great services which he has rendered in securing the completion of the Dictionary."

The resolution was carried with acclamation.

The following gentlemen were elected to form the committee:—Mr. Macvicar Anderson, President of the Royal Institute of British Architects, Professor Aitchison and Professor Hayter Lewis.

Mr. Papworth and Mr. Cates both thanked the meeting for their kindly expressions towards themselves and for the resolutions which they had passed.

It was then proposed and carried that should the balance be larger than was expected the difference should be added to the 100%, which was to be handed to Mr. Papworth.

After a cordial vote of thanks to the chairman for his services as honorary treasurer for so many years and for presiding on the present occasion, and also to Mr. Cates, the honorary secretary, and Mr. Wyatt Papworth as the working members of the society for the energy with which they had carried the work to its completion, on the motion of the chairman, seconded by Mr. Rickman, it was resolved, "That the funds and property of the Society be handed over to the honorary treasurer, honorary secretary, and Mr. Papworth to be appropriated in accordance with the preceding resolutions, and that the Society be dissolved from this day."

HIGH BUILDING IN BALTIMORE.

ACCORDING to a correspondent of the *American Architect*, the spirit of high building has reached Baltimore, but with such lagging footstep did it approach, and so long after it had already become a familiar and essential feature in even much smaller cities, that, did we not unfortunately feel more certain that a lack of confidence and enterprise had much more to do with the matter, we might almost have felt that a sense of discretion and fitness hesitated to thrust the new and doubtful innovation upon us, with our unrestrained capacity for lateral extension, and our old existing types of low and broad architecture. However, it is present with us now in a mild form comparatively to the prevalence of the epidemic in other places but with most of its important features, and while the lateness of its arrival may bring the mitigating circumstance that fewer of the abnormally high buildings will be erected before a reaction of opinion and restricting ordinances begin to control excessive height, it may also have the unfortunate result that those which shall have already sprung into existence will stand isolated, conspicuous and hideous, destroying all symmetry and uniformity, and lacking even the somewhat impressive effect of continuous and uniform bigness that may be attained in the streets of some other cities. The marked architectural feature of last year in Baltimore was undoubtedly the advent of this style, as shown by several large

office and bank buildings and one or two apartment-houses, and the one building that is unquestionably more worthy of note than the others is the Equitable, on the site of the old Barnum's Hotel. This building, as a type, would easily be ranked among the other best ones of the same class, of about similar dimensions and cost, erected in the last few years in many of our larger cities, the conditions to be met resulting in a good deal of similarity of arrangement and of exterior design, with like merits and defects, to a large extent, appearing in all of them. The form of construction is, of course, the usual iron and steel skeleton method that now universally obtains. Two points are worthy of note in regard to the contractor's work: one being that among the eight or ten contractors who were the original bidders the average of those from out of town was about one hundred thousand dollars less than that of the Baltimore men, on a total cost of less than one million; another point attracting public attention was the diligence and systematic method with which the work was done, and the absence of obstruction outside the lines of the building itself, in favourable contrast with the inconvenient occupation of a large portion of the adjacent street in most cases where work of any extent is in progress. The building is a ten-storey structure of granite, buff brick and terra-cotta, an agreeable mass of colour, with as satisfactory disposition of solids and openings as the requirements of a huge office building usually admit of, and with rich Renaissance details, appropriately treated in the different materials of both exterior and interior. As to the strictly architectural impression produced—the result seems very much the same as that of other similar buildings, even the most successful, throughout the country. The lightness of walls that are only screen-work, filling in the construction, and not the real building itself, produces shallow reveals and lack of shadow about all openings that give a general appearance of thinness and weakness, the more evident the larger the building. The difficulty of designing a cornice as a grand crowning feature in proper proportion to the immense wall-height below it, and to admit of the practical requirements of the upper storey, is also felt, as well as the question of varying the exterior treatment of so many similar storeys with any intelligent reason that may not seem a mere fancy, and with a design that will take its proper place in the whole scheme. The substitution of numerous elevators for a grand staircase in buildings of this class is certainly the loss of a great architectural feature, which ages of tradition and a certain sense of fitness and completeness still call for in the name of architecture and art, and refuse to be satisfied by the replies of mechanical theory and practice, and, indeed, the extremely subordinate place to which the staircase in many of these buildings is relegated appears to us, from the most practical point of view, almost a criminal error, in the event of possible emergencies when the elevators would be almost useless.

Let us award to this style of building—"style," if we must, *faute de mieux*—all possible merit that the best of them can claim as actually good, because actually representing the spirit of the age. Is this a real architectural merit that we are recognising after all, or is it not rather that the spirit of the age does not ask for architecture but only engineering, with the largest financial returns for the amount expended and space occupied, and only such architectural features superficially applied as will satisfy the vulgar taste for ornament and ostentation, equally satisfactory to the majority of the public when used by an ignorant charlatan or when designed by a cultivated and intelligent artist? If truth is the standard to judge by, then the best of these tall buildings are those where these falsely applied architectural proportions to the wall surface are frankly abandoned, as being "an outward and visible sign of an inward and spiritual grace" of a real construction, and where the wall surfaces that fill in the spaces of the concealed metal structure are simply pierced with openings that sufficiently give access and light to the interior, and tell the true story of the building's purpose. We do not say that appropriate ornament may not be found to give beauty to these wall surfaces and openings, or that the principal perpendicular and horizontal lines of the structure beneath might not be, to a certain extent, indicated on the exterior in the true spirit of design. Nor do we say that this method of construction is not, from many points of view, a very excellent practical way of housing the people of the nineteenth century, with a certain impressive effect about it from mere bigness, but we must admit that if all we have learned to call architecture, from prehistoric times till to-day, and which attained its epitome of perfect beauty of fitness and proportion in Greece, is one thing, then the modern ten or twenty storey building is another; if Athens and Rome and the Middle Ages and the Renaissance and Paris is one thing, in their monumental dignity, symmetry and repose, then New York and Chicago and the spirit of the age is something else which is not dignity, symmetry nor repose; nor, in spite of apparently vast new sources of knowledge, can the average humanity of to-day claim any great physical, intellectual or moral superiority, or greater capacity for real happiness, or any nearer approach to heaven

on the top of the Eiffel Tower than in the shadow of the Parthenon.

Baltimore will probably never have a rival to either of these typical expressions of their times, but she is said to have expended fifteen million dollars in her building operations for the year 1892—in no one edifice specially worthy of note, beyond the one already mentioned, but, to help house her thirty-six thousand new inhabitants gained in the same year, she has built her usual number of small and characterless dwellings, with here and there an individual house cropping up, marked by the effort to assert itself in somewhat larger dimensions and more expensive materials—and a very large amount of carved ornamentation. The majority of these designs seem to come from the same source, and, while not degenerating to the point of an “aberration,” are without artistic reserve or architectural interest; the florid ornamentation is applied as an after-thought and not as an essential part of a scheme, and with a painful disregard of the proper scale or application of details. These houses, however, seem to meet with popular approval.

NEW BUILDINGS.

Birmingham.—Alterations and additions have been completed to Messrs. Pickard & Lloyd's “Tool Works,” situated in Woodcock Street, Birmingham. This building, which was erected probably during the latter part of the last century, has practically been remodelled. The old blacksmiths' hearths and fittings, workshops, &c., have been removed, and others of a more modern and improved kind substituted. A large blacksmith's shop covered with glass, and with louvre ventilators and a spacious two-storey tool-shop, &c., have been erected, so that a previous inconvenient and dilapidated building has been transformed into a well-arranged and substantial one. The work has been carried out in a satisfactory manner by Mr. Shergold, builder, of Aston, from plans prepared by and under the superintendence of the architect, Mr. J. Statham Davis, of Birmingham.

Horsham.—A new Grammar School was opened at Horsham on the 29th ult., providing accommodation for a hundred day scholars and twenty boarders. These new buildings owe their existence largely to the Mercers' Company, a distinguished member of which—Richard Collier—founded the school in 1530. The buildings form a large block on the Hurst Road, near Horsham Station, and the site occupies three acres of land nicely laid out for gardens, playground, cricket-field, &c. The materials are of red brick, Horsham stone, and Staffordshire tiles, built in sixteenth-century Gothic style. The contract for the whole of the work was entered into with Messrs. Potter & Son, Horsham, builders, at 5,795*l.*, and the work has been finished within the allotted period, the total cost being, as adjusted, 3*l.* 6*s.* 8*d.* less than the contract sum. Mr. Arthur Vernon, of 29 Cockspur Street, Charing Cross, was the architect.



Four-inch v. Six-inch Drains.

Appeal to the London County Council.

Sir,—I have been much interested in a recent appeal to the London County Council *re* four-inch v. six-inch drains, and as the subject is of great importance to the public generally, I ask the favour of your inserting the enclosed correspondence in your next issue.—I am, dear Sir, yours faithfully,

SHARTMAN WANSBROUGH.

Arlington Villa, Barrow-in-Furness :
May 15, 1893.

Dear Sir,—Permit me to express my warmest appreciation and thanks for the determined manner in which you have recently upheld one of the most important laws relative to house-drainage, in appealing and reversing the requirements of the Fulham Vestry to lay six-inch drains to thirty small houses. The decision of the London County Council in favour of four-inch drains is a great advancement in sanitary construction, and will undoubtedly prove invaluable in the hands of other sanitarians, when appealing against the use of six-inch drains, to be able to cite as a precedent the decision which you have been the means of securing from such a powerful authority as the London County Council.

I may mention I have had many six-inch drains taken out which have been a continual nuisance in becoming fouled, and by substituting four-inch drains to the same fall as the old six-inch drains the nuisance has been completely remedied, without in any way altering the flushing arrangements which existed.—I am, dear Sir, yours faithfully,

SHARTMAN WANSBROUGH.

Ernest Turner, Esq., F.R.I.B.A.

246 Regent Street, London :

May 16, 1893.

Dear Sir,—I thank you for your letter of yesterday's date, and hope the case will be a useful precedent.

I have no objection to your communicating with *The Architect* as you propose; indeed I think a statement of your own experience may help forward a good cause.—I am, dear Sir, yours faithfully,

ERNEST TURNER.

Shartman Wansbrough, Esq.

GENERAL.

The Six Days' Auction of works left by the late M. Meissonier—that is to say, of one division of the property—ended on Saturday last. The sums paid amounted in all to 2,216,101 frs.

The Annual General Meeting of the Surveyors' Institution, to receive the report of the Council and the announcement of the result of the election of officers for the ensuing year, will be held on Monday, May 29, at three o'clock. The prizes awarded to successful candidates, in connection with the recent professional examinations, will be presented by the President.

The Annual General Meeting of the Institution of Civil Engineers will be held on Tuesday, the 30th inst., when the report of the Council will be submitted and the Council for the ensuing year elected.

A Bust of the late M. Duc, the architect, who had charge of the reconstruction of the Palais de Justice, Paris, has been placed in one of the galleries of the building. It is the work of M. Chapu.

The Fourth Annual Congress of the Societies in union with the Society of Antiquaries will be held at Burlington House on Monday, July 10, under the presidency of Sir John Evans.

A Statue of Johann Arany, the Hungarian poet, has been erected in Buda-Pesth in front of the Museum. The sculptor was Alois Strobl.

Mr. Frederic Salmon Growse, the Indian art critic and archæologist, of Her Majesty's Indian Civil Service (retired), died on Friday, of phthisis, at his residence, Thursley Hall, Haslemere, Surrey, at the age of fifty-six.

Prizes amounting to 4,000*l.* have been offered by the French Society of the “Canal des Deux Mers” for projects in connection with the contemplated ship canal between the Mediterranean and the Atlantic.

The Annual Meeting of the Royal Society of Antiquaries of Ireland commenced at Kilkenny on Monday, and during the subsequent days various places of interest in the district were visited.

Dr. Steindorff has been appointed Professor of Egyptology in the University of Berlin. Some years ago he had charge of the Egyptian Section of the Berlin Museum.

The Jubilee Meeting of the Royal Archæological Institute is to be held this year in London, from July 11 to July 19 inclusive.

M. Gabriel Geailles has obtained a part of the Prix Guérin from the French Academy for his book, “Léonard de Vinci, l'artiste, le savant.”

Mr. Horace Townsend will read a paper on “American Silver Work,” at the Society of Arts, on Tuesday, the 30th inst., in the Applied Art Section.

A Party of Members of the Junior Engineering Society inspected the Tower Bridge works, by permission of the engineer, Mr. J. Wolfe Barry, on the evening of Wednesday, the 24th inst. Since the Society's last visit to these works (in July 1892) much progress has been made, the lifting spans having already been experimentally rotated.

An Exhibition of Alsatian Art and Archæology has been opened in the old timber-house, the “Kammerzill,” opposite the cathedral in Strasbourg. Over seven hundred examples are shown.

Mr. Walter Severn, president of the Dudley Art Gallery, who in 1885 presented the Adelaide and Melbourne Art Galleries with some of his characteristic and picturesque water-colour drawings, has just presented the Sydney Art Gallery with another of his pictures.

Beethoven's House, in Bonn, is now restored to a condition corresponding with its appearance in 1770, when the composer was born in one of the garrets. On the 10th inst. the Beethoven Museum in it was opened.

The Society of Architects has been registered with a limited liability by a licence from the Board of Trade to dispense with the word “Limited” as an addition to its name. Objects: To acquire and take over the assets and liabilities of the unincorporated association known as the Society of Architects, established in 1884. The membership is limited to 500, and each is liable for 1*l.* in the event of winding up.

The Architect.

THE WEEK.

It is not often there is so remarkable a contrast of entertainments as was to be witnessed on Saturday in Sheffield Park, near Brighton. The owner is among the most enthusiastic supporters of cricket, and on that day there was a match in the grounds between the Sheffield Park and Barcombe Clubs, when the former for six wickets achieved 371 runs. As the victory was safe, Lord SHEFFIELD and a party of his friends found time to assist at the unrolling of a mummy in the pavilion, by Dr. BUDGE of the British Museum. It was brought from Egypt by his lordship a few months ago. The subject was identified as a priestess of Apu. Her name was TA-SHERET-MEHT. Her father's name, it appears, was NES-HERU, a piece of information rarely given, as Egyptian genealogies followed the female side. Apu, which is now known as Akhmim, was an ecclesiastical town. The style of embalming adopted in this case was economical. Instead of a necklace of stones, there was only a representation of one on a sort of breastplate. Ornaments of all kinds were absent. The priestess was probably about thirty-five at the time of her death. It must be allowed that the operation was disappointing, for there were no revelations. TA-SHERET-MEHT may have been too fond of lecturing or comminating, for the embalmers did not open her mouth; and, therefore, during two thousand years her spirit has been dumb. If she and her friends anticipated that one day she was to be displayed in an English park as a counter diversion to cricket we suppose they would have provided for the occasion by a supply of information about themselves, which would be more acceptable than trinkets. Their want of foresight will not prevent anyone who was present from joining in the prayer which accompanied the remains:—"O God OSIRIS, the President of the Underworld, the Great God, Lord of Abydos; O thou God PTAH-SEKER-OSIRIS, the Great God within the tomb; O thou God ANUBIS, the God of the Divine Land, the President of the Hall of Judgment; and O thou Goddess ISIS, the Mighty Lady, the Divine Mother, dwelling within the town of Apu; grant sepulchral meals of oxen and wild birds, and milk and wine; grant incense, and spices, and linen, and all good, beautiful, pure, sweet, and delightful things to the deceased lady, TA-SHERET-MEHT, the daughter of NES-HERU, son of the lady of the house, TA-SHERET-AMSU. Triumphant in judgment, may she breathe the soft breezes of the north wind for ever and for ever."

THE Médaille d'Honneur for architecture at the Salon has been won by ALPHONSE DEFASSE, who gained the Prix de Rome in 1886. In painting M. FERDINAND ROYBET has obtained it through his stirring picture, *Charles le Téméraire à Nesles*. M. CHARPENTIER is the fortunate sculptor, and M. LAMOTTE has gained the medal for engraving. The following are the awards of the ordinary medals in the section of architecture:—1st class medal, M. CAMUT; 2nd medals, MM. GODEFROY & BAUHAIN, NODET, NORMAND, BOBIN; 3rd medals, MM. RIVES, BERNARD, NAUDIN, PETIT, HÉNEUX, MAJOU, YPERMAN; honourable mentions, MM. ANTOINE & ARFVIDSON, BALLÉ, BINET, BOISSEAU, BOUTRON, CHAUSSEPIED, GRAVIO, DELMAS, DESBOIS, ESCHBAECHER, FORTIER, KOCH, LE GRAND, MALO, MASSA & HENRY, MIGNAN, DE MONCLOS, MONTJAUZE, MOURÉ, PILLETTE. Among the paintings it was found that not one merited a first-class medal. In the section of sculpture the first-class medals were awarded to MM. LARCHE and LABATUT, and to M. TONNELIER for his examples of medals.

THE assessor appointed by the Lunacy Committee of the Staffordshire County Council to consider the designs sent in competition for the new County Asylum, Cheddleton, is Mr. C. H. HOWELL. On Saturday he made his report, and under his advice the premiums were awarded by the committee as follows:—1. "(2)," 2. "Spes (1)," 3. "Efficiency." The successful competitors are—1. Messrs. JOHN GILES & GOUGH, 28 Craven Street, Charing

Cross, London, W.C.; 2. Mr. GEORGE T. HINE, 35 Parliament Street, London, S.W.; 3. Messrs. J. G. IZARD & A. B. COTTAM, 5 Bloomsbury Square, London, W.C. The competitive plans and designs will be on public view at the Shire Hall, Stafford, on Monday next and two following days, between the hours of 11 A.M. and 5 P.M.

ON Tuesday the annual meeting of the Institution of Civil Engineers was held. The tabular statement of the transfers, elections, deaths and resignations during the year showed an effective increase of 207 on the previous total of 5,371—or at the rate of $3\frac{7}{8}$ per cent. per annum—while as regards the students, the decrease was 49. The gross numbers on the books on March 31 in 1892 and in 1893 were 6,239 and 6,397 respectively. The strict income had amounted to 20,854*l.* 8*s.* 6*d.*, an increase of nearly 800*l.* on the former year, to which had to be added 3,980*l.* 0*s.* 6*d.* on account of capital, and 442*l.* 10*s.* 2*d.* for trust funds, bringing up the total receipts to 25,276*l.* 19*s.* 2*d.* The general expenditure had been 16,527*l.* 17*s.* 6*d.* (including 7,750*l.* for publications, and for premiums under trust 522*l.* 2*s.* 10*d.*); while there had been invested 8,254*l.* 12*s.* 2*d.* in British railway debenture stocks of the nominal value of 7,000*l.*; thus the total was 25,304*l.* 12*s.* 6*d.* The summary of investments showed that there stood to the credit of the Institution 111,400*l.*, with trust funds of the par value of 15,606*l.* 0*s.* 10*d.*, together 127,006*l.* 0*s.* 10*d.* The ballot for Council resulted in the election of Mr. ALFRED GILES as president; of Sir ROBERT RAWLINSON, Sir B. BAKER, Sir JAS. N. DOUGLASS and Mr. J. W. BARRY as vice-presidents; and of Dr. W. ANDERSON, Mr. A. R. BINNIE, Sir DOUGLAS FOX, Sir CHAS. A. HARTLEY, Messrs. J. C. HAWKSHAW, C. HAWKSLEY, and ALEXANDER B. W. KENNEDY, Sir BRADFORD LESLIE, Mr. J. MANSERGH, Sir GUILFORD MOLESWORTH, Mr. W. H. PREECE, Sir E. J. REED, and Messrs. W. SHELFORD, F. W. WEBB and W. H. WHITE as other members of council.

ON Wednesday the annual dinner of the Architectural Association took place at the Criterion Restaurant, a number of the old members, along with friends and supporters of the Association, being present. Among those whom the president (Mr. H. O. CRESSWELL) welcomed were Mr. MACVICAR ANDERSON, the president of the Institute of Architects; Mr. GEORGE AITCHISON, A.R.A.; Mr. WALTER CRANE, Mr. E. W. MOUNTFORD, the president-elect; Mr. GOLDSMITH, Mr. E. S. GALE, Mr. PAUL WATERHOUSE, Mr. FLORENCE and many other past-presidents and well-known members. It is hardly necessary to say that Professor KERR, who has always been so interested in the welfare of the Association and of students, was present. After a toast to Her Majesty the QUEEN, the President proposed the toast of the Royal Academy. Though one of the best-abused societies in the country, architects had at any rate to thank it for maintaining the classes from which he for one had derived great benefit. Professor AITCHISON, in responding, alluded to one claim the Royal Academy had on their gratitude, inasmuch as its teaching was given gratuitously. In regard to the architectural instruction given, that would depend very much on architects themselves, who should make up their minds as to what they wanted and what was practical. Mr. ANDERSON, in replying to the toast of the Institute of Architects, spoke of the cordial relations existing between the two societies, and of the way in which the examinations had tended to stimulate the cause of architectural education in the country. He also congratulated Mr. CRESSWELL on the good work he had done as President, and anticipated good work in the future from the President-elect. Professor KERR proposed the toast of the evening in his usual eloquent and happy style. He raised a laugh amongst his audience, saying that he considered the architects of England to form the most honest of all the professions, not excepting the medical profession or the Church. He knew of no institution in the country supported by students alone who had done better, sounder or more persevering work than the Architectural Association. Other toasts followed, to the President and officers, the studio, &c. Songs were sung during the evening by Mr. CONSTANDOUROS, Mr. GROSSE, Mr. TATLOCK and others, and a violin solo given by Mr. WILLIS. An old friend of the members, Mr. IMHOF, presided at the piano.

THE GRIEVANCES OF BUILDING WORKMEN.*

IN a time when discontent appears to be one of the agencies for governing the world we cannot expect workmen to be more exempt from its influence than the people above them. If men were always satisfied with their lot there would be few improvements introduced, and it would not take long to bring us all back to a more barbarous condition than now prevails. The cause of discontent nowadays is the scarcity of money. We are all too poor. It may be true, as the Greek CLEANTHES said, that the best way to become rich is to be poor in desires; but it is not everybody, and in the nineteenth century especially, who, like that philosopher, can have the patience to lie abed, deeply thinking, because he has lent his one garment to a brother stoic, and is happy when he gets the chance to earn a few pence daily by carrying water. While we may grant that no wealth is equal to virtue, we must not forget that, as long as we are not entirely spirits, virtue has a very close affinity for substantial things which have to be paid for. Lord BACON once drew a sketch of "a believing Christian," no doubt with the intention of suggesting that his lordship was writing of himself from self knowledge, and the model man, it appears, "is rich in poverty and poor in the midst of riches; he believes himself to be a king, how mean soever he be, and how great soever he be, yet he thinks himself not too good to be the servant to the poorest saint." The difference between the philosophic rascal's profession and practice is not more wide than exists between the words and actions of some modern and well-to-do teachers, who believe that resignation should be acquired at all cost by the humbler classes, and that "the sovereign'st thing on earth for an inward bruise" is some sort of paradoxical parmaceti such as BACON suggests, and which divines, lawyers and philosophers at all times are adepts at preparing. The world is now as out of joint as ever, and it is absurd to suppose that workmen, who have so much to do with the movements, should not be allowed to suggest that a new arrangement of the parts, or the application of some new lubricant would not be an improvement.

The British workman, including the most skilful, have one grievance which would try the virtues of any philosopher, that is, there is a sort of prohibition against following the natural law of development. The trade societies prefer to foster at the most only an average amount of power, and prefer that members should remain below it rather than rise above it. It is not inscribed over the places of meeting that those who enter must abandon all hope of advancement; but practically that is known to be the spirit of the unions. We have only to ask, what has been done during the present century by the leaders of those powerful bodies to promote education or to raise the character of the work produced in their respective trades? We may grant that it is quite possible for workmen as a body, the most politic course to adopt is one which brings all things to a common, if a dead, level of mediocrity. At the same time, it cannot be denied that such a course is most oppressive for many individuals who are prompted by a sort of instinct to attain knowledge and practical power. It impedes their mental growth, and they must suffer in consequence. Is not this a grievance which is more prevalent among British workmen than others elsewhere? At one of the sittings of the Labour Commission Mr. F. A. MOORE, a builder's foreman, who is a carpenter and joiner, but is not a society man, said:—"I hold it ought to be the legitimate and the proper ambition of every workman to have, in the first place, the technical mastery of his own trade, and in time of all the allied trades. Take the case of a workman who simply stops when he becomes a journeyman, and is content with earning his journeyman's wages; there is something terribly depressing about that spectacle, I think." That is, however, a spectacle which is to be witnessed in almost every town in Great Britain and it is not one which is creditable to trades-unionism as a principle. Again, the same witness said he had generally noticed in his own trade that men of the very best ability, both educationally and technically, are practically the most

in the background. He was pressed by Mr. MUNDELLA (who appears to have faith in tracts as a remedial agent for social difficulties, and believes the workman is now more respected and honoured for his virtues than heretofore), about the influence of literature on the working carpenters and joiners. Rather inconsequentially the witness mentioned that he was acquainted with one of the trade who had turned musician and appears on concert stages, and with a joiner's son who is a tenor and can obtain 30s. to 40s. a week. "These are isolated cases," he added, "but you can find them extended largely." The conclusion we suppose that Mr. MOORE had drawn in his own mind was that a man who is eager to succeed must come out of the ranks of carpenters and joiners, and as the affairs of the trades are managed, he would not be far wrong. In America they could practise as architects as well as musicians. The sagacious Mr. MUNDELLA imagined he had caught the witness tripping, and the following dialogue between the two, which we give parenthetically, has interest as revealing the knowledge which our rulers possess about architectural practice:—

But do you think as a rule that men who have not been educated to the profession make good architects?—No. I know as a matter of fact of more than one eminent architect who has been a workman before he became a professional architect.

But does he not undergo examination?—Unquestionably.

And become a member of the Association of British Architects?—Yes.

Then he gets a sort of diploma which enables him to practise?—Yes.

There is nothing to prevent any man doing that? But you are aware that many practising architects in England are not members of the Association; any member will corroborate that.

The building trades call for many varieties of skill, and it seems hard that a man who may possess constructive or artistic powers of a high order should receive the same pay as another workman who is incompetent to exercise much thought, and therefore is inferior to a machine. In Somersetshire, for example, the plasterers are paid no more than 4½d. or 5d. an hour. The wage is too low, but for a man who does ornamental work it appears to be unjust. As the workmen are, however, satisfied to be treated as if possessed of equal merits and demerits, they cannot be surprised that masters are chary about attempting to distinguish those who deserve notice and reward for industry and ability. Professor MARSHALL, who represents political economy on the Commission, stated that a great number of employers informed him that they would gladly pay higher wages to deserving men, and that their only reason for not adopting that course is that they have found the giving extra pay to some men causes a strike on the part of the inferior men. Apart from ability there is the important difference in the possession of tools, which in some trades means a corresponding difference in productive power. Mr. MOORE expressed the feeling of the men whose pride in their work has not been overcome by the unions when he said:—"I do not like to find myself on a Saturday going to the pay-office and getting just the same as the most inefficient man in the shop. Perhaps I have a hundred pounds' worth of tools to begin with; I dare say in my time I have spent quite that in tools alone, and I find myself on the Saturday receiving the same wages as a man whose tools could be bought for 15s., all the tools he has on earth. It is things like that that operate to discourage men." All such evidence (and much more could be cited) should be sufficient to convince an intelligent workman belonging to a building trade of the way his condition is affected by his fellow-workmen, and he must see that as long as the standard to which he must subject himself is that of an inferior workman, he cannot expect fair play from builders or their employers—the public.

The workman in the building trades makes light of what he endures on account of his fellow-workmen when he considers all that contractors can inflict on him. His grievances under this head may sometimes be imaginative, but often they are too real. Some of them are modern. Every architect knows, to his cost, that the business of contracting has gone through many modifications during recent years. It can no longer be certain in every case when dealing with a contractor that one is sure to meet with a man who has had some training for his position in a workshop or on building works. That undefinable being,

* *Minutes of Evidence of the Royal Commission on Labour, Her Majesty's Stationery Office.*

"a business man," who is ready to undertake all sorts of risks so long as there is a chance of profit to be derived from them, has invaded too many trades. Without experience or training he is ready "to run" theatres or dispensaries, assurance companies or bakeries, chapels or creameries, separately or conjoined, with equal avidity. Sometimes he holds an interest in an architect's office, but of the two he prefers a builder's business. He knows there is a glut of specialists of all kinds in the markets, and he invests in them as he would in a piece of machinery or a sky sign. We are afraid he is responsible for the majority of the complaints which were brought before the Commission by workmen of the building trades. If a similar inquiry were instituted twenty years ago there would be carpenters, masons, bricklayers, plumbers and painters who could testify to the existence of arrangements that did not meet with their approval, but the case against contractors would be, unless we are mistaken, conducted on different lines.

It is through the influence of the new spirit which comes from the connection of speculators with building that so many efforts are made to deceive architects by substituting inferior work or materials, in order that the amount of profit from contracts can be increased. What does the genuine City man care about keeping up the traditions of good building? His interest in that sort of business may only be temporary, and his ambition is to render it as productive as other ventures. Knowing so little about the execution of works, he adopts the course which is common with commercial ventures, and endeavours to get rid of risks by means of sub-contractors. Unfortunately he finds imitators among men who were trained as builders, and should be proud of their business.

It was characteristic of Mr. MUNDELLA that he could not understand why workmen should make any grievance out of the irregular conduct on the part of their masters. Hands are not to assume the censor's office. As long as they are paid their wages they should be satisfied. A plasterer in his evidence spoke about a strike of his trade at one public building where they believed some of the piecework "was being scamped to the highest degree." Mr. MUNDELLA asked him, "If you were receiving the regulation wages and working the regulation hours what ground had you for that strike?" When the witness replied, "Because the work was not being done as they considered it should be done in accordance with the specification," he was pulled up sharply with the question, "That was not your business, was it?" and the witness was made to feel that what plasterers sought after was not better work but a slower execution of work for their own convenience.

The late Mr. BRIGHT convinced himself that adulterating was a legitimate element in business, and we suppose defective work, if it can escape the architects, should also be tolerated as part and parcel of the most modern system of production. But if workmen more often refused to make use of unsatisfactory materials, or to carry out orders for scamping, would it not be an advantage to the community? Mr. DEW, the secretary of the London Building Trades Committee, in his evidence referred to those London Board Schools which are falling to pieces as examples of a pernicious, if approved, system of contracting. He said:—"This had become so bad, this had become so unbearable, and the workers had suffered, having been forced and hurried in their work, working under cruel taskmasters, doing their work in an inferior and scamping manner, that they determined to put a stop to it." As long as evils are overcome, the nature of the agency employed is of secondary importance, and the public have reason to be grateful to any class of men who will aid in preventing a repetition of abuses like those of the London School Board, and for which facilities are given by the system of local government. As defilement follows the touching of pitch, so it is impossible for any man to assist in carrying out contracts in a dishonest way without becoming demoralised. The men also know that a contractor who will sacrifice every interest to profit will not draw the line at materials or workmanship. They must expect that he will, when dealing with them, interpret his obligations in his own way, and for that reason they have a right to be on their guard and to watch his tactics.

The evidence given before the Labour Commission by

workmen is mainly directed against the agency of sub-contractors. Mr. MUNDELLA, who made himself prominent in the inquiries, appears to confound sub-contractors with contractors for specialties. When a carpenter was telling him about men being employed at joinery in gangs on the piecework system the Chairman remarked:—"Surely there are some great plumbing houses of London who do all the sanitary-fitting, closets and so on, and all the plumbing from top to bottom, and who have not only a London reputation but a reputation all over Europe—the best hotels in Europe are fitted up by these men," and his words would show that Mr. MUNDELLA believed that all sub-contractors were as renowned as Messrs. JENNINGS or Messrs. DOULTON are in sanitation. When their names appear in architects' specifications they no doubt belong to a select class. But the mens' notion of a sub-contractor is a taskmaster, who has to get work done so quickly as to insure profit for himself and others above him; he is a magnate who is not easily impeded, and is not over-particular about the means he adopts to achieve his ends. In one case we hear of a sub-contractor who adulterated the specified KEENE'S cement with from 30 to 50 per cent. of lime and plaster. With contractors for brickwork a favourite dodge of getting work done expeditiously is the following:—

A taskmaster will take the job of laying bricks on a building at so much a thousand or so much a yard, or whatever the system agreed upon is. Then the taskmaster will employ, perhaps, a couple of men who are well known in the trade by the name of "bell horses." I will just explain what this means. Probably they are two of the strongest and most lusty men he can get; he will give them, perhaps, 3d. or 4d. an hour more than he will give to the other men. They have got to push the line up; that is, to take the corners and some of the leading parts of the building and push the line up as quick as they can, and the general gang of men who are working along it have to keep up level as the line is moved, or otherwise they have to be discharged.

It will be said that a contractor is obliged to adopt strategy of that kind to compel men to put energy into their work, for with members of trades unions the rate of progress is set by the weakest or less efficient member of a gang. But other cases were mentioned which suggest that what is sought is expedition, even at the expense of substantial work. Take the following as an example of what is done in woodwork:—

Speaking of my own particular trade—I am myself a carpenter and joiner—the sub-letting leads to many evils. It leads to scamped and inferior work. Perhaps you will understand readily if I illustrate my meaning by a door. Of course a door requires very careful preparation. Its joints require to be well fitted, and then in putting it together it should be thoroughly cramped and glued, but when you are doing it on the piecework principle you have taken the door at a certain price, and, of course, you want to make it pay. The glue-pot is not hot, the glue is not ready, and in many cases the door goes together without glue at all. Then sometimes you wonder why your doors are cracking and falling to pieces in your houses. You may get a fair price for some doors or sashes or frames, or whatever it might be to-day, and you would earn, perhaps, at the end of the week a reasonable amount of wages; but there will be another lot of doors to be made the week following, and the employer will say, "Oh, you have made so and so out of this; I shall only give you so and so for the next lot," and then, perhaps, you cannot find employment elsewhere, and you are practically compelled to take what the employer offers.

We find a representative of the house-painters also testifying to the want of thoroughness in the completion of work:—

I have great objections to raise against the system under which the work is done, and I would like to find or to suggest a remedy with reference to that. I allude more especially to the cases where work is scamped in an outrageous manner, and unskilled and inferior workmen are employed in a most unfair manner, causing serious injury to the workmen and to the public also. By employing unskilled labour in the place of skilled, and by scamping the work, this evil arises. The remedy is obvious: the employment of skilled labour and skilled supervision. I think there is an important point that may be dealt with in reference to the skilled supervision of work. As it is, the work is allowed to pass muster no matter how inferior it is got up, provided it looks well from the surface, or provided it passes.

London seems to be the region where the sub-contracting system appears in its least agreeable aspects. In the country there are not always buildings on a scale of sufficient magnitude to tempt speculators to meddle with them, and people are not so ready to pay big prices for extraordinary expedition in completing works. The provincial witnesses appeared to know of the system only by hearsay. According to a witness from Liverpool (it is true he represented the builders) the system of sub-

contracting works satisfactorily in the North. In Scotland separate contracts are common; but, unless in railway works, there are no sub-contractors who supply labour only. A Glasgow mason stated that, as far as his experience went, piecework or tasking was generally of an inferior class.

All lovers of good building will be likely to side with the workmen, for, as one of the witnesses well said, "that building over the way, the great Abbey, that was not carried out by a pushing and driving energetic foreman"; it was carried out by the "master workmen." But the men who were employed at Westminster Abbey could hardly have adopted principles like those of the unions; as far as we know, there was no impediment to a mason putting forth all his strength. The modern system of sub-contracting is mainly to be ascribed to commercialism, but there is no doubt the men themselves have helped to make it necessary. When a builder finds that with old-fashioned ways of dealing with his men his contracts do not pay, it is only human that he should be tempted to follow the course which novices in contracting find to be profitable, that is, to obtain the services of foremen or sub-contractors who are despots, and will control the workmen as rigorously as the law will allow. The prices at which work has to be undertaken can often become remunerative only on the supposition that workmen will become more active in order to secure employment. Men will not pay much attention to that theory, and, moreover, they believe the majority of contracts are profitable to somebody. In such cases contractors cannot be expected to accept ruin through a fear of wounding the susceptibilities of workmen by keeping an eye on the quantity of carpentry or masonry that is produced, especially as they must know that any sacrifice on their part will not excite gratitude.

(To be continued.)

GLASGOW INSTITUTE OF ARCHITECTS.

A MEETING of the Glasgow Institute of Architects was held on Thursday, the 25th ult., the president, Mr. W. Forrest Salmon, in the chair. The following correspondence relating to the recent by-laws framed under the Building Regulations Act was read:—

115 St. Vincent Street, Glasgow:
April 8, 1893.

Mr. J. Lang, City Chambers.

Sir,—In response to the Lord Provost's request to know as early as possible the result of my council's meeting, which was held after the meeting with your committee, regarding the building by-laws, I wrote to his lordship on the 27th ult., informing him that my council had agreed to recommend the Institute to withdraw its opposition to the proposed by-laws.

I have now to inform you that the recommendation of the council has been confirmed by the Institute, and I enclose an excerpt from the minute of the general meeting, which records in detail the reasons which have led the Institute to agree to withdraw its opposition.

I shall be glad to hear from you before sending formal intimation of withdrawal to the Secretary for Scotland.—Yours truly,

C. J. MACLEAN.

Excerpt from minute of the quarterly general meeting of the Glasgow Institute of Architects, held at Glasgow on Thursday, March 30, 1893. President W. Forrest Salmon in the chair.

The Sub-Committee on Building By-laws having reported to the council the result of a second interview which they had with the Committee of the Police Board, the council agreed to recommend the Institute to withdraw its opposition to the by-laws on the understanding that by-law No. 73 would be struck out, and that it was the intention of the Town Council to prepare in a year or two a Building Act for Glasgow more thorough in character than the existing Acts, and to consult with the Institute when framing the clauses. On the motion of the President the Institute adopted the recommendation.

NOTE.—At both of the interviews great stress was laid by the Commissioners upon the temporary character of the present Building Act and by-laws and the certainty of further and more complete legislation in "a year or two." Attention was directed to section 12 of the Act, which gives the Dean of Guild Court discretionary power with regard to the provisions of the Act and by-laws, and it was asserted that under this section any enactment that was found to be unnecessary or oppressive would be relaxed, while every opportunity would be given to architects to introduce materials and modes of construction other than those prescribed. It was pointed out that section 72 of the Act empowers the Secretary for Scotland to allow or disallow any by-law, but not to amend or alter it, so that the consequence of pressing the Institute's objections would be that, where

these were given effect to, the by-laws would not be amended as the Institute desired, but would be lost altogether. The Commissioners admitted that a considerable proportion of the objections were well founded, and acknowledged that the action of the Institute had been directed to the promotion of good building.

By-law No. 3, Drawings.—This was a question merely of the scale of block plans, and the matter will be dealt with in any future enactment.

By-laws Nos. 9 and 10, Mortars.—The only difference of opinion here was with reference to Portland cement mortar, and as the Institute approves the by-laws so far as other mortars are concerned, it was not thought necessary to press the point in the meantime.

By-law No. 11, Concrete.—The sub-committee adheres to its opinion that this by-law provides for an unnecessarily large proportion of cement in Portland cement concrete. The necessity for some restriction was admitted, and as the only alternative to leaving the by-law as it stands seemed to be its total deletion, it was thought better to leave it. It was also stated that the by-law referred to concrete in foundations, and that it was not applicable to concrete used otherwise, and further that the matter would be fully considered in any future enactment.

By-law No. 15, Thickness of Walls.—The principle which the Institute contended for, that walls ought to be classified in determining their thickness, was fully admitted. The by-law was acknowledged to be incomplete and imperfect, and its development in the manner referred to in the objection was promised.

By-law No. 29, Safe-loads for Floors.—It was admitted by the committee of the Commissioners that the safe-loads prescribed would be in many cases excessive, but it was pointed out that there was no power to prevent a building which was erected for one purpose being afterwards used without alteration for a different purpose, and one, it might be, involving much heavier loading of the floors. If such power was obtained this by-law might be greatly relaxed. It was also stated that temporary buildings of every kind were exempted from compliance with the by-law.

By-law No. 35, Roof-lighted Stairs.—It was admitted that this by-law was defective. In view of the importance of having common stairs adequately lighted and of the dispensing power of the Dean of Guild Court, it was strongly urged that it should be allowed to pass as a temporary provision, which would be enforced only so far as it was considered desirable by the Dean of Guild Court.

By-law No. 73, Stairs in Public Buildings.—It was agreed to delete this by-law.

City Chambers, Glasgow: April 10, 1893.

Dear Sir,—I am in receipt of yours of 8th inst. informing me that the recommendation of your Council has been confirmed by the Institute, and enclosing me excerpt from the minute of the general meeting which records in detail the reasons which have led the Institute to agree to withdraw its opposition.—Yours truly,

C. J. MacLean, Esq.

J. LANG.

City Chambers, Glasgow: April 10, 1893.

Dear Sir,—In reply to yours of the 8th inst. (already acknowledged), I am directed by Bailie Primrose, the chairman of my committee, to thank your Institute for the withdrawal by it of its opposition to several of these by-laws, and to express the hope that your Institute will at the earliest possible convenience inform the Secretary for Scotland of that withdrawal, so as to admit of the by-laws being forthwith confirmed and put into operation.—Yours faithfully,

C. J. MacLean, Esq.

JOHN LINDSAY.

115 St. Vincent Street, Glasgow: April 12, 1893.
The Under-Secretary for Scotland,
Dover House, London.

Sir,—I beg to enclose excerpt from the quarterly general meeting of this Institute, held on the 30th ultimo, agreeing to withdraw their opposition to the by-laws under the Glasgow Building Regulations Act, for the reasons stated in the excerpt, and I further formally intimate that the opposition is now withdrawn, except as to by-law 73.—I am, &c.,

C. J. MACLEAN.

Office of the Secretary for Scotland,

Whitehall, S.W.: April 13, 1893.

Sir,—I have to acknowledge the receipt of your letter of the 12th instant and enclosure.—I am, &c.,

COLIN SCOTT MONCRIEFF.

The Secretary, Glasgow Institute of Architects,
115 St. Vincent Street, Glasgow.

THE TEMPLES AT GIRGENTI.

A CORRESPONDENT of the *Manchester Guardian*, who is travelling in Sicily, gives the following account of a visit to the ruins at Girgenti:—

The Greek "Akragas," the Roman "Agrigentum," stretched at one time from the hilltop on which the modern town now stands down to where a natural terrace of rock separates the hillside from the lower level near the sea. Along this rampart, which was worked up into a wall, the temples were built, and there they are still to be seen in a mighty row, two still standing upright, the rest, destroyed by enemies and earthquakes, lying

in ruinous heaps. How the city must have looked when it held 40,000 inhabitants and occupied the whole hillside, its lower boundary rimmed by temples which glistened with a marble-like coating, and were decorated with sculptured ornaments picked out in many colours, we can hardly conceive; but even now the sight is lovely. The buildings, with the coating worn off, show the original colour of the stone, a warm golden tint, and they stand out grandly on the edge of the old wall, since honeycombed with early Christian graves and catacombs. Between the huge fluted columns, through which the wind whistles eerily, we look down upon the low land and the sea beyond, and upwards to the rising country, green with almond-trees in freshest leaf, and violet in the shadows where the passing clouds sweep over the hillsides. How magnificently the Greeks chose and used their sites is one's first reflection, and the next how beautiful is the setting which nature and a happy climate have given to the ruins of their handiwork. Grand monuments, just saved from gauntness by their soft colour, set among the freshest and most charming landscape—truly a sight not soon to be forgotten. Around the temples grow the small dwarf palms whose form is seen again in the ornaments which crowned the temples, as may be studied with many another detail of their decoration in the museum at Palermo. This is another reason for taking Palermo last. See first, at Segesta and Selinunte as well as Girgenti, the dry bones of the temples; then learn at Palermo how the bare forms were clothed with plastic ornament and brightened with varied colour.

TESSERÆ.

The Province of Art.

TO define what we mean by art in general is a somewhat difficult task. It is difficult to furnish not only a correct, but a complete definition. We may say too much or too little, including more in its domain than legitimately comes within its province, or excluding some of its proper functions by drawing our limits too close. If we may venture upon a definition of art, we should describe it as the contrivance, the method, the system by which the human mind makes use of the material world for its own purposes. It is, indeed, the necessary result of the position of an immaterial being, clothed in a material body, and placed in the midst of a universe from whose resources it must draw abundantly for the satisfaction of its desires and necessities. The soul within us can hold no converse, save with a pure spirit, without employing the powers of the physical creation in which she dwells. Not only is she compelled to have recourse to them for the preservation of her own state of being, and for the supply of those bodily wants to which she is irresistibly compelled to attend, but without these she can in no way communicate with her fellow-men; she cannot express to them either her thoughts or her feelings. Her divine capacities are powerless until they can avail themselves of the countless objects of sense that surround them, in order to utter those sentiments which are in themselves the operations of the pure, spiritual intelligence. And when she turns to the visible creation of which she finds herself an inhabitant she perceives that not only can she make use of its boundless resources for the support of her present life, for the increase of her enjoyments, for the gratification of her appetites and the charming of her senses, but that, by a certain marvellous and mysterious pliability, this whole universe can be made the instrument by which she pours forth those ideas which have their origin in the depths of her own immaterial essence. Creation is to her not only what it is to the beast of the field, but also the element of a language most wonderfully fitted to convey to others every thought that may arise in her inmost recesses. By the constitution of her being she is capable of a multitude of sublime ideas, of great, pure and noble sentiments, and of tender, reverent, loving emotions, to which by the same constitution she is impelled to give utterance at various times and in various circumstances. Apart from every consideration of utility or experience, she is conscious of a certain intimate connection and relationship with a world of spirits, some of them, like herself, wrapt in the garments of a material mortality, others the denizens of an invisible world, of whose characteristics all she knows is that it is inhabited by spiritual beings beyond the reach of her senses. Then, casting her eye upon the physical universe around her, she perceives that, from the varied laws by which it is governed, and from the wonderful attributes and qualities which its different portions possess, she may draw the means for entering into communion with that which is invisible, and that helpless though she be to communicate directly with aught that is spiritual while it is clothed in a material body, in this land of boundless wealth she may discover means for pouring forth all that she desires to utter. Hence also arises the distinction between "the fine arts" and "the mechanical" or "useful arts." The useful arts, as the term is generally employed, are occupied in furnishing man with what is

necessary to his existence in life, or what conduces to his bodily comfort and luxury. The fine arts, on the contrary, are devoted to the suggesting to the mind certain thoughts and emotions which possess a power to charm, or to the expression of those ideas which the mind desires to communicate through the medium of what is audible or visible. Of the five senses of the body, three are busied with the useful arts, namely, the touch, the taste and the smell; the others, that is the hearing and the sight, are the instruments of the fine arts, the channels by which the sensation of beauty is conveyed to the mind, and by which spirit communicates with spirit.

Coloured Sculpture.

A passage occurs in the 35th book of Pliny, c. 11, directly supporting the practice of colouring the accessories of statuary:—"This is that Nicias (the Athenian painter), concerning whom Praxiteles said, when asked which of his works in marble he most approved of, Those which Nicias has applied his hand to: so much Praxiteles attributed to his tinging (*circumlitioni*)." This last word may be rendered adorning with paint, doing over, or, as its sense is more exactly supplied in the German, *umschmieren*. The work of Sir Charles Fellowes on his important discoveries in Asia Minor has thrown light on the earliest history of Grecian art, and established the identity of cities referred to by Herodotus and others with the remains that indefatigable traveller has been the first to make known. An inscription was found by him at the ancient Aphrodisius, in Caria, to this effect, "That Callias, grandson of Zeno, the son of Eudamus, an honourable and good youth, whose conduct was virtuous and worthy of all praise, be honoured with the greatest and fairest honours; and that there be put up his statues and sculptures and images, painted in golden armour, in the temples and public places, whereon there are also to be inscribed his honours fair, and befitting and becoming his family and the conduct of his life; and that these worthy inscriptions be likewise placed on his tomb, in which his brother Zeno also is buried." Here follows the epitaph. According to this inscription, the temples and public places of Aphrodisius were decorated with statues in painted or gilt armour; for ΕΙΚΩΝ ΓΡΑΨΙΤΗ (the phrase employed) is a painted statue or image of the personage to whose honour the tomb was erected. In a note to the same valuable work of Sir Charles Fellowes, the authority of one of the greatest scholars both in the literature and art of Greece that the present century has possessed is adduced to bear the same testimony. "The satisfaction I received," says the author, "on my return to Athens, in renewing my acquaintance with the justly celebrated Professor Müller, has made me more aware of the immense loss Europe has sustained by the death of one of her greatest scholars in all the vigour of life. On seeing the coloured drawings of this tomb (the author speaks of one he had discovered in Myra, a city of Lycia, the walls of which were surrounded with reliefs entirely coloured), he expressed the following opinion as to the mode of colouring adopted by the Greeks in their works of art:—"The ancients painted their bas-reliefs; they only tinged their statues; tinging the drapery, leaving the flesh part uncoloured; the wounds and blood were stained, and the ear-rings and ornaments gilded. Their temples were left white, but parts of the frieze and architectural ornaments were coloured, but very minutely. Their temples of coarse materials were plastered and entirely coloured. The Parthenon frieze was coloured; all the backgrounds of their bas-reliefs were painted." In further corroboration of this were discovered, some years since, in the excavations at the Count Lozzani's villa, near the Porta Pia, Rome, the three large sarcophagi which are now in the Gregorian Museum at the Lateran Palace, and whose reliefs, as well as the walls of the tomb containing them, were entirely coloured on their first exposure—the wreaths of flowers on one with all the hues of nature, the Orestes pursued by the Furies and other groups, all in well-preserved tints. Since their removal to the museum, from whatever cause, these have almost entirely disappeared.

Painters' Dexterity.

Giotto unquestionably possessed a singular degree of mechanical dexterity as a mere artist. This superiority in executive power is, indeed, no unfrequent accompaniment of the highest order of talent and genius in all divisions of art and mental cultivation. Few men think well who cannot speak well. Verse is generally easy to those in whom the poetic fire burns with brightness. To Michel Angelo the manual use of the mallet and chisel seemed to come by nature. Handel, Mozart and Beethoven played as it seemed almost by inspiration. And so also with the great restorer of painting. The pencil was to him an instrument over which he seemed to possess a natural sovereignty, and the well known proverb, "Più tondo che l'O di Giotto," bespeaks a dexterity in its use such as few painters have attained. When invited to Rome by Pope Boniface VIII., says the story, Giotto was asked by the messenger from his holiness to give him a specimen of his famous powers. Upon this the painter traced upon paper in

a moment, with a single turn of the pencil, a circle so perfect in form that the messenger, and afterwards the Pontiff, were at once convinced that the painter's merits were at least equal to his fame. This story of Giotto's wonderful dexterity of hand reminds one of the well-known anecdote of the two great Greek painters, Apelles and Protogenes. Apelles went to Rhodes to see Protogenes and his works, and, as Pliny relates the incident, found Protogenes away from home, and no one in the studio but an old woman, taking charge of a panel upon an easel, ready prepared for the painter's hand. When the old woman inquired of the visitor what name she could give to her master when he returned, Apelles took a pencil wet with colour and drew a line (*linea*) upon the panel, bidding her show it as the visitor's memorial of himself. Protogenes returning, saw the line, and exclaimed, "None but Apelles could have traced that line." He then took a pencil, and, with another colour, drew upon the same (here the mystery of the story begins, as the pronoun used by Pliny does not show whether he meant "upon the same line" or "upon the same panel"), a yet finer line; and going out again, desired his servant to show it to Apelles when he should call again. Apelles again visiting the studio saw himself outdone, and immediately with another colour drew a third (*secuit lineas*), attaining the utmost limit of fineness; and Protogenes coming home, confessed himself vanquished. This panel, with the three lines, was preserved at Rome in the Imperial Palace on the Palatine, till it was destroyed by fire in the reign of Augustus, so that Pliny never saw it himself, but told the story as related by others. The account itself is full of obscurity, and has been a fertile source of conjecture for the curious.

Imitative and Illustrative Painting.

Among the Greeks, a belief grew up that the painter and the sculptor must follow the descriptions of the poets, as these were held to have anticipated the artist's conceptions, and established a previous settlement on his ground. A recollection of some of the themes which the Greek artists treated, satisfies us that Apelles or Zeuxis, and most of the renowned painters of antiquity, derived their subjects from the mythological or other fables of their time. For his "Jupiter" and "Minerva" Phidias drew on the bards who had excited his imagination with such themes. Homer supplied the moral proportions and relations, and for the physical elements out of which he combined and constructed these ideal personifications of omnipotence and wisdom, he went himself to Nature. The "Venus" of Apelles, the "Helen" of Zeuxis, and the "Galatea" of Raphael drew their inspirations from the prevailing traditions and ideas caught from the poets. That these controlled the respective artists, we learn from the difficulties which each encountered in finding in ordinary nature the forms that would suffice to render satisfactorily the accepted notions with which the public mind was familiar. Michel Angelo, in the Sistine, in his Prophets, and his Sibyls, drew for his grand creations on the inspired portions of the Scriptures, or on the fables of Pagan mythology. To what extent in the Middle Ages the imagery of Dante controlled or directed the imitative capacities of the painter, it were superfluous to mention, except for the purpose of observing that religious principle was as much the motive in that time to both painter and poet, and therefore as necessarily suggested a conformity of action, as it was in the old Pagan period. There have not, however, been wanting opinions which such cases do nothing to justify, that Art is elevated by seeing Nature generally, and, as a rule, through the poet's spectacles. "In some instances," observes Lessing, "it is a greater merit in the artist to have imitated Nature through the medium of the poet's imagination than without it. The painter who has delineated a beautiful landscape, after a Thomson, has performed a higher task than he who has copied it directly from Nature. The latter has the original immediately before his eyes; the former must exert the powers of his imagination until he fancies he sees it before him. The one produces a beautiful imitation of distinct and palpable lineaments; the other has to arrange a discretionary effect from faint and fleeting images." This is dangerous doctrine. Art so derived can at best give but a second-hand impression of Nature. The painter has thus delegated his own power of seeing Nature to another, in entire neglect of the peculiar requirements and technical capabilities of his own art. This opinion of Lessing's shows how capricious and unpractical are some of the dogmas which the unprofessional critic does not hesitate to promulgate, and which the artist is too often weak or unthinking enough to accept.

Hebrew Art.

Whatever arts the Israelites may have originally possessed, it was obviously the policy of Assyrian and Roman conquests to annihilate. It must, however, be recollected, in considering Hebrew Art, that the great incentive to Art-study was wanting to the Israelite. Forbidden, by Divine command, from employing it on the noblest objects and for the highest purposes, Religion, which in other countries enlisted and almost engrossed

the artist's assistance, in Judæa rejected his aid; and thus deprived of its patronage, and excluded from its service, it is not surprising that no school of Art should have been formed worthy of a nation which, by its poetry and its music, has established a character for all time. The knowledge necessary for the production of the Tabernacle and its furniture (entrusted to Bezaleel and Aholiab) may be partly ascribed to the influence of types suggested by the Court of which they had so long been subjects. Of painting we hear nothing. The embroidered works which are described to us suggest an hypothesis of no great extravagance. Their execution implies a previous design—the possibility of supplying which is established by the present existence of such pictorial examples as were produced in Egypt three centuries before that time. It is then not too much to assume that they may have called into requisition for their embroidery such coloured designs as were necessary to furnish the worker in blue, purple, scarlet, and fine linen with the patterns for his occupation. Embroidery was an early form of the pictorial expression. Tyre and Babylonia were celebrated for their works of this kind; and although Homer, so explicit in his descriptions of sculptured shields, is silent on painting, he particularly describes the productions of the needle. That early display of chromatic art was, by a curious coincidence, among the latest suggestions and incentives to the production of some of the noblest creations of one of the greatest minds the world ever saw—for the cartoons of Raphael were designs to be elaborated through the instrumentality of the embroiderer's skill. That the adequate amount of native talent did not exist when, in the height of Jewish prosperity, it was sought to execute a most important work involving multiform considerations of fine-art character, is made apparent when King Solomon, in seeking to realise the plans which his father transmitted to him for the construction of the Temple, found himself necessitated to apply for assistance to a neighbouring monarch. The solicitation itself is an admission made by the Hebrew king, that his native resources, either in material or skill, were inadequate to the importance of his task—while the reply of Hiram is eloquent of the great degree of refinement to which the several arts had attained among the Phœnicians. The extent of their maritime and commercial enterprise is strikingly made known in that chapter of Ezekiel which predicts the fall of their capital. The Phœnicians are known also to us through the page of more modern history, and could our own coast speak, it would be eloquent of their frequent visits.

Theories of Modulation.

It is a curious circumstance, as illustrating the practice of architecture by the Athenians at the best period of their art, that while one finds that a system of allotment of dimension to architectural parts by scale in each building is coherent and consistent, it was in no wise empirical, since another structure erected at much the same time and in the same style will equally have its parts coherent and consistent amongst themselves and yet diverse in certain respects from the contemporary monument. With the Romans, and still more with the Italians, in the revival of Roman architecture the system of allotment of parts by scale, based upon the subdivisions of the lower diameter of the column, or what is known as the subdivision of the module, became no longer elastic, as it had been with the Greeks, but dogmatic. The most accomplished architects fought during the sixteenth century over what may be called the true theory of modulation applicable to each of the five Orders, but all their efforts tended to the establishment of each man's canon as the infallible and inflexible canon of universal application. What was originally then intended as an assistance to the architect, became only a prison and strait waistcoat for him. Such scales of proportion, however carefully devised, produced monotony and constant feebleness in architecture, and only tempted the enthusiastic, who broke away from too strict confinement to launch out into excesses, by which any excellences the system may have possessed were utterly thrown to the winds and lost sight of. To this tendency to rebel against constituted authority much of the extravagance which in Italian architecture became introduced successively through Michel Angelo, Bernini, Borromini and others, may be considered as due.

Vitruvian Proportion and Perspective.

Vitruvius lays down some rules used by the most celebrated Grecian artists, taken from their own writings, for the symmetry or proportions of the human figure and also the geometrical figures which circumscribe its general form and motion. He says, "if a man lies on his back his arms and legs may be so extended that a circle may be drawn around, touching the extremities of his fingers and toes, the centre of which circle shall be his navel;" also, "that a man standing upright, the length of his arms when fully extended is equal to his height." Thus, that the circle and the square equally contain the general form and motion of the human figure. He also says, "the human figure is eight of its own heads in height, or ten faces

from the chin to the growing of the hair, each face containing three equal parts." From these hints and some others in his work, with some also given by that philosopher and painter, Leonardo da Vinci, in which he has pursued the same profound mathematical train of reasoning, a complete system of proportions and motion may be laid down upon the ancient Greek principles. Concerning the optics and perspective of the ancients he has the following passage:—"Agatharcus, of Athens, made a tragic scene under the direction of Æschylus, and left a commentary upon it; being instructed by that, Democritus and Anaxagoras wrote on the same subject, in what manner the extension of rays to the point of sight, by an appointed centre, should answer to the lines by natural reason, so that the certain and uncertain images of buildings should be rendered in appearance by painted scenes, which should be viewed in front on the perspective plan; so that some should retire and others come forward." This passage appears to contain as much of perspective as was known to the ancients, and amounts to this—that rays from visible objects meet in the eye as a centre, and that objects should be represented prominent or retiring, according to their proposed situations. This is certainly all the knowledge of perspective shown in the ancients' works of art, however excellent in other respects; and indeed, from the imperfect description of the eye given by Hippocrates, we have no reason to believe that the nature of vision or the science of optics were much understood when Agatharcus, his contemporary, wrote his commentary on perspective.

A Gothic Revival.

If we consider Gothic architecture to be one of the creations of a great national spirit, we shall at once account for the difficulty of reviving or reproducing it. The Gothic mind aims at constant progression, is not satisfied with retracing steps already trodden; it will not work readily in the trammels of imitation, it will rather attain new glories than strive to recover those that have passed away. We shall find that we have great architects as well as great masters in every other branch of art, if we do not suffer them to be cramped with needless restrictions. The old spirit is not dead in us, nay, it never was more active. Research scarcely owns a limit; science has unveiled marvels surpassing the fictions of Northern mythology; a summary of its triumphs would now be a puerile declamation on familiar facts, as it would formerly have been thought to be upon impossibilities and absurdities. The higher our aims the fairer is the prospect of success. In every other matter, while we honour and value the works of our predecessors, we make use of them as the groundwork of further acquisitions; we continually build upon them instead of merely striving to attain to the same elevation. If a system becomes obsolete we do not attempt to revive it unless we find upon examination that a recurrence to it will give us a fairer start in the pursuit of truth. Our reverence for great names does not make us look at any perfection hitherto attained as a standard or limit, it rather urges us on to a higher perfection; we feel that all we have done in science and art is but an advance towards the truth, not a realisation of it. We may indeed start anew from a given point, if by so doing we may hope for new and great results, but this is a very different thing from taking as our standard of excellence some point that has been already reached. It is true that the desire of improvement and progress has often led to decline and fall; the movement may for a time be downwards, but not backwards; the Gothic mind cannot, in its very nature, be either stationary or retrograde. It is because we have Gothic blood in us that we cannot revive Gothic architecture.

Bayeux Cathedral.

Though it is a composition of various dates, thrown together in a sort of casual way, and though the details of the two towers do not exactly agree, yet the different stages of the front of Bayeux Cathedral are worked together so as to produce a very striking effect. The later work seems not so much to be struck upon the earlier as to grow out of it. One could hardly have thought that spires, among the most elegant of the elegant spires of the district, would have looked so thoroughly in place as they do when crowning towers, the lower parts at least of which are the work of the famous Odo. There is nothing of that inconsistency which is clearly marked between the upper and lower parts of the front of St. Stephen's at Caen. The interior of the cathedral, besides its spaciousness and grandeur of effect is attractive on other grounds. Many facts in the history of Normandy are plainly written in the architectural changes of this noble church. The most interesting portion, indeed, does not appear in the general view of the interior. The church of Odo, the church at whose dedication William was present, and which must have been rising at the time of the visit of Harold, now survives only in the crypt of the choir and in the lower portions of the towers. The rest was destroyed by fire, like so many other churches in Normandy, during the wars of Henry I. Of the church which then replaced it, arcades of the nave still remain. No study of

Romanesque can be more instructive than a comparison of the work of these two dates. Odo's work is plain and simple, with many of the capitals of a form eminently characteristic of an early stage of the art of floriated enrichment—a form of its own which grew up alongside of others, and gradually budded into such splendid capitals of far later work as we see at Lisieux. A striking contrast to the work of Odo—a contrast as striking as can easily be found between two things which are, after all, essentially of the same style—is to be seen in the splendid arcades of the nave, one of the richest examples to be found anywhere of the later and more ornamented Romanesque. The arches are of unusual and very irregular width; the irregularity must be owing to something in the remains or foundations of the earlier building. They are crowned, however, not by a triforium and clerestory of their own style, but a single clerestory of coupled lancets of enormous height with the faintest approach to tracery in the head. The effect is striking, but certainly somewhat incongruous. The choir is one of the most beautiful productions of the thirteenth-century style of the country, always approaching nearer to English work than the architecture of any other part of the Continent.

Polychromy of Sicilian Temples.

Among the earliest Greek works known to us are the temples of Selimuntum, in the south of Sicily. The colony was founded about 650 B.C., and was destroyed in 409 B.C. In the earliest of the temples there can be no doubt that there was colour, from the fact that the metopes are painted. There are also very distinct remains of colour in the other temples. The Duke of Serradifalco, in his work upon the temple of Selimuntum, says:—"The excavations carried out in the temple E and the ædicule B of the Acropolis gave new and more evident testimony of this sort of ornament. There remains of the first many trunks of columns coated with the finest white plaster, and one of them still retains three horizontal zones, each of which is successively painted with red, white and blue. The lintel of the architrave is red, that of the guttæ blue. The triglyphs are painted blue upon the face with black channels. The astragal (?) of the capitals red; and to the posticum of this temple belong certain mouldings in terra-cotta of a yellowish colour, with frets and other ornaments painted in red and dark grey. From various fragments we learn that, as in the Parthenon, the ground of the metopes is blue; and upon the arm of a female figure one discovers some traces of red, which colour as well as blue is much more clearly discoverable in a fragment of drapery found in the posticum of this temple. Nor should we here omit to mention the very singular circumstance that we find the cap of one of the triglyphs first painted red upon the stone, afterwards coated with stucco, and at last repainted with the same colour. We have more important remains of the ædicule B, namely, the trabeation of the south-west angle, one of the lions' heads of the cymatium, in which there remains still the sinking prepared to receive it; one angle and various fragments of the pediment, the whole cap of the ante, the lower portion of the shaft of a fluted column, with part of its Doric cap, and several fragments of minor importance. From the observations made upon these remains we find that the whole fabric was coated with a very fine stucco of a pale yellowish colour, the lintels of the architrave, of the bed-mould, of the corona, and of the mutules; the last blue with white guttæ, blue also are the triglyphs and their fascia, which is divided into two by a very fine line. The capital and what remains of the ante is of a yellowish tint, and all the sunk lines are marked with a fine black line, so as to give more effect to the other mouldings." M. Hittorff goes much further. Indeed, he does not pretend to confine himself to the facts found in the ruins of this temple, but unites fragments and authorities from other temples in Sicily and elsewhere to produce his ideal of the Greek system of polychromy. The Temple of Jupiter, in the island of Egina, supposed to be about forty years earlier than the last of the temples of Selimes, still shows very clear traces of colour. The best authorities have established that the triglyphs were painted blue, the tænia red, the mutules blue; their fillet and the rest of the soffit of coronæ red; the cymatium enriched with a honeysuckle in gold; several mouldings and the soffit of portico painted, &c. There is no evidence that the broad surface, the shaft and caps of columns or the wall of cella were painted. The large patches of blue presented by the triglyphs appear crude and unhappy, and little in accordance with the refined taste of the artists of Egina, but we find an explanation of this in Vitruvius, where he tells us that in the early wooden constructions the ends of the beams (the triglyphs) were covered with a board painted with blue wax to preserve it from the action of the weather; and, as we find in other temples where there are traces of colour that the triglyphs were likewise blue, it is clear that this ancient practice was carried into later times, as a tradition which popular prejudice and a religious reverence for antiquity insisted upon preserving. In the sculptured parts there are undoubted evidences of colour; the shields and the crests of the warriors were painted red, parts of their arms and armour gilt, while the tympanum of the pediment was blue.

NOTES AND COMMENTS.

VISITORS to the cemetery of Père Lachaise, in Paris, cannot fail to remember the statue of Baron TAYLOR that stands in a prominent position. He was a busy and benevolent gentleman, who was at one time director of the Théâtre Français, and held other offices. As he was well acquainted with the precarious incomes of some classes in Paris, he founded five philanthropic societies, which were to be supported partly by the subscription of the members and partly by contributions from the charitable. He began in 1840 with one for actors and actresses; in 1843 another was founded for musicians; and in 1844 one for painters, sculptors, architects and engravers. They were so successful that in 1849 a fourth was founded for inventors and industrial artists, and in 1858 the last of the series was organised for the benefit of teachers. The five societies have now a secured annual income of 486,127 frs., which is equivalent to a capital of about 15 million of francs. The expenditure in pensions and in temporary relief has amounted to 9,333,098 frs. It is no wonder so many people appear grateful when they gaze on the white marble statue of the Baron.

THE Cluny Museum in Paris lost its able director, ALFRED DARCEL, on Saturday. It was owing to the tact of M. DARCEL that many improvements in that most interesting treasure-house were effected. Anyone who can remember the condition of the museum ten years ago will be able to appreciate the efforts of the director. From its foundation the collections were invaluable, but by his agency they have been increased and systematised. It was out of respect for M. DARCEL's efforts that the late M. DE BEAUMONT, the water-colour artist, made over his collection of swords, which so many wealthy amateurs were prepared to purchase at a fabulous price. M. DARCEL was a native of Rouen, and was educated as an engineer. But he was more fascinated by the antiquity of his native city than by the modern improvement works, which are, however, of undoubted interest. He gave himself up to archæological research, and so much success followed his labours that he received an appointment in the Louvre. After the fall of the Empire, M. JULES SIMON (the one man in France who deserves to be made permanent Minister of Public Instruction) appointed M. DARCEL to the direction of the Gobelins factory. There his scientific training served him. But in 1885 he was able to secure his transference to the more agreeable office of director at the Cluny Museum. For thirty years he was a most efficient public servant.

It is proposed to hold in the course of the spring of next year a congress in Paris, which will be attended by representatives of the various societies in France that are associated in any way with art, and especially industrial art. The congress is promoted by the Union des Arts Décoratifs. The intention is to form a sort of federation by the aid of which there will be a continuous interchange of objects belonging to the societies that are associated in the experiment. The idea is derived from the loan collections of the Science and Art Department, but at present there is no certainty whether the French Government would approve of such a scheme. The Union is possessed of a most valuable collection of examples, which are practically of little use to anybody, as there is no place in Paris where they can be properly exhibited. These works could, with advantage, be put in circulation among the provincial towns.

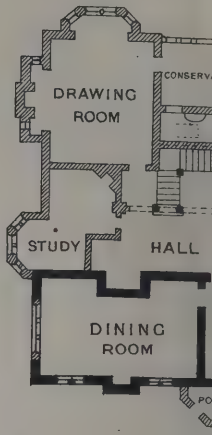
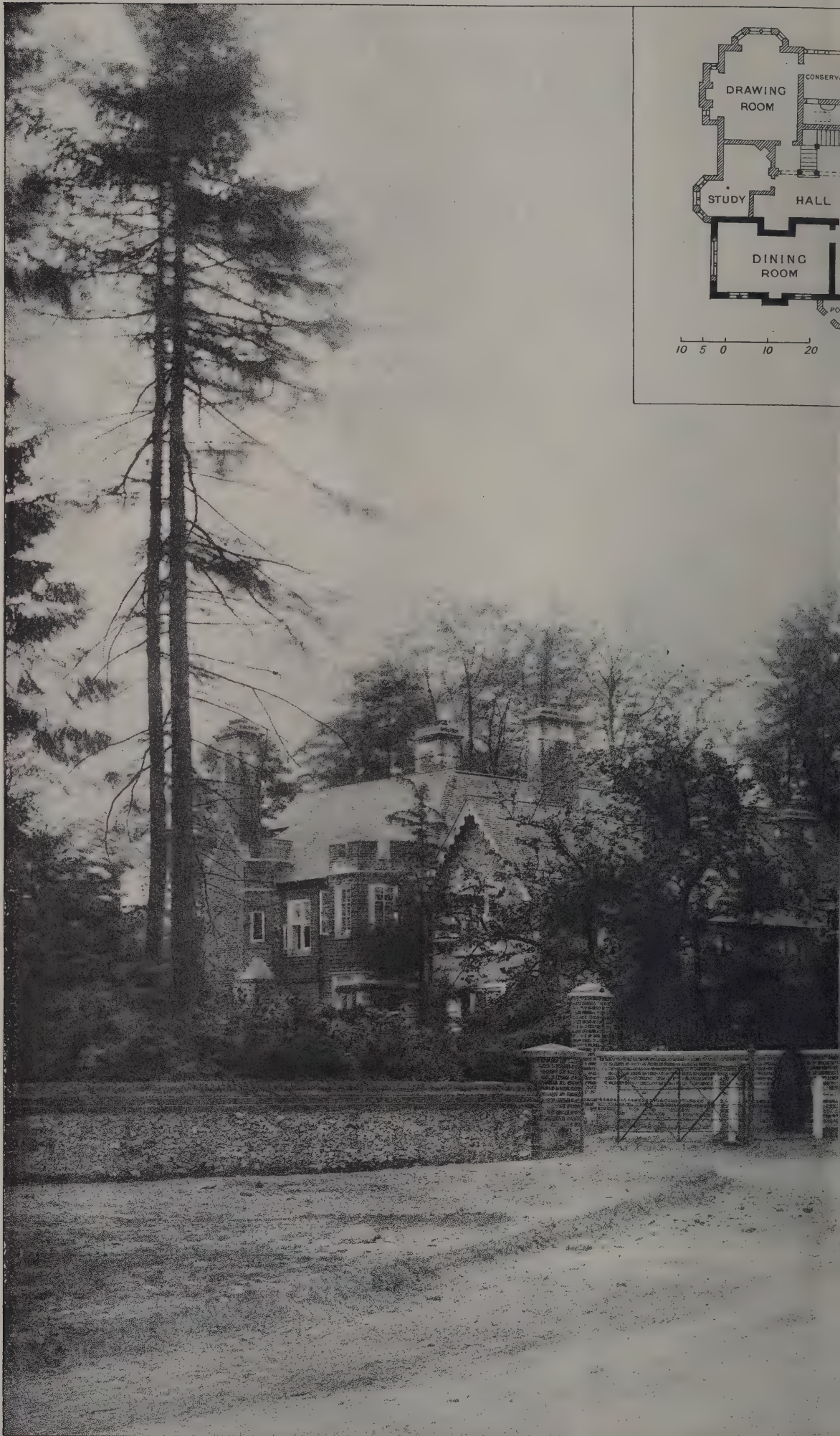
AFTER long years of neglect the Austrians have realised that they once possessed a great sculptor named GEORG RAPHAEL DONNER, and last week in his birthplace, Esslingen, as well as in Vienna, they endeavoured to make amends by festivals in his honour. He was born two centuries ago, and was the son of a carpenter. While a choir boy in a monastery he received some instruction in art from a sculptor employed there. Little is known about his career, and his works are his best memorials. Among them are the figures of gods and children in the Mirabell Castle, Salsburg; the seraphim in the Esterhazy Chapel, Pressburg; the angels in the Buda Pesth Museum, which were formerly in a church; his Viennese works, the statue of CHARLES VI. in the Belvedere, the well-known fountain in the Mehl-

markte, and the PERSEUS and ANDROMEDA in the old Rathhaus. It is supposed that DONNER came to Vienna in 1724 and was employed by the Emperor. Afterwards he went to Salsburg, where he worked in the Mirabell Castle. For ten years he remained with Prince ESTERHAZY in Pressburg. Leaving him, DONNER once more turned his steps to Vienna, where he lived for two years. He died in that city in February 1741, and was buried in the Nicolai cemetery, but his grave is not to be recognised. DONNER was evidently a man of genius, who by a sort of instinct felt that the extravagance which was in vogue in his day was out of keeping with the true principles of sculpture, and that simplicity and truth were preferable to the most dexterous freaks. He was happy to find patrons who could appreciate him, but apparently he was not worldly-wise, for he lived and died in poverty.

MARSHAL DAVOUT, who was one of the Napoleonic chiefs, is to be commemorated in a novel but useful fashion. His daughter, the Marquise DE BLOCQUEVILLE, has left 300,000 francs which will be employed in the erection of a lighthouse on some dangerous point of the coast of Brittany. It has been decided by the French Minister of Public Works that the site is to be at Penmarch. The lighthouse is to be of the first class, and electricity will be employed for the illumination. The chief engineers of the "service central des phares" have co-operated in preparing the plans, and M. PAUL MARBEAU has given his aid as architect. DAVOUT received the title of Prince of ECKMÜHL for his services at the battle around that village, which was fought on April 22, 1809, when the united French and Bavarian army defeated the Austrians. He was created Duke of AUERSTADT after his victory over the Prussians on October 14. On the same day NAPOLEON won at Jena, and the simultaneous battles have received a common name and are known as the battle of Jena.

A PAPER was lately read by Mr. A. CAWSTON on street improvements in the Metropolis. It will form the basis of a volume which Mr. STANFORD is about to publish, under the title "A Comprehensive Scheme for Street Improvements in London." It will be illustrated by views of improvements lately carried out in Paris, Vienna, Brussels, &c., and by sketches of some of the proposed improvements in London, besides maps of London and Paris. The author says that one main purpose of his book is to show that, by systematically working to a comprehensive plan, it will be quite possible to completely transform the streets of London, with no greater strain upon our finances than that caused by the spasmodic and feeble attempts at improvement that have been made during the past forty years. The interest in the book should not be confined to Londoners, for the principles relied on may be adopted in other cities and towns.

THE Employers' Liability Bill has been considered by a committee of the Faculty of Advocates in Scotland, and of course it has been found wanting. Reasonable men could not fail to arrive at a similar decision. The committee of the Advocates have not approved of the abolition of the doctrine of common employment. They thought that the secondary responsibility, as it had been termed, of an employer for the fault or negligence of his workmen should continue to rest upon the principle explained in the Bartonshill case—that "where injury is caused to anyone by the negligence of another, and the person injured seeks to charge with its consequences any person other than him who actually caused the injury, it lies upon the person injured to show that the circumstances were such as to make that other person responsible." Workmen in the same grade of employment, and who were actually engaged in the same work, ought not in fairness to be entitled to impute one another's faults or negligence to their common employer, and visit him with the consequences, if in point of fact he had not been guilty of any fault or negligence towards them. The committee were accordingly of opinion that the total abolition of the doctrine would involve an unfair extension of the liability of employers, and they did not think it would tend either to increase the regard of workmen for their mutual safety or to promote the employers' care for them.

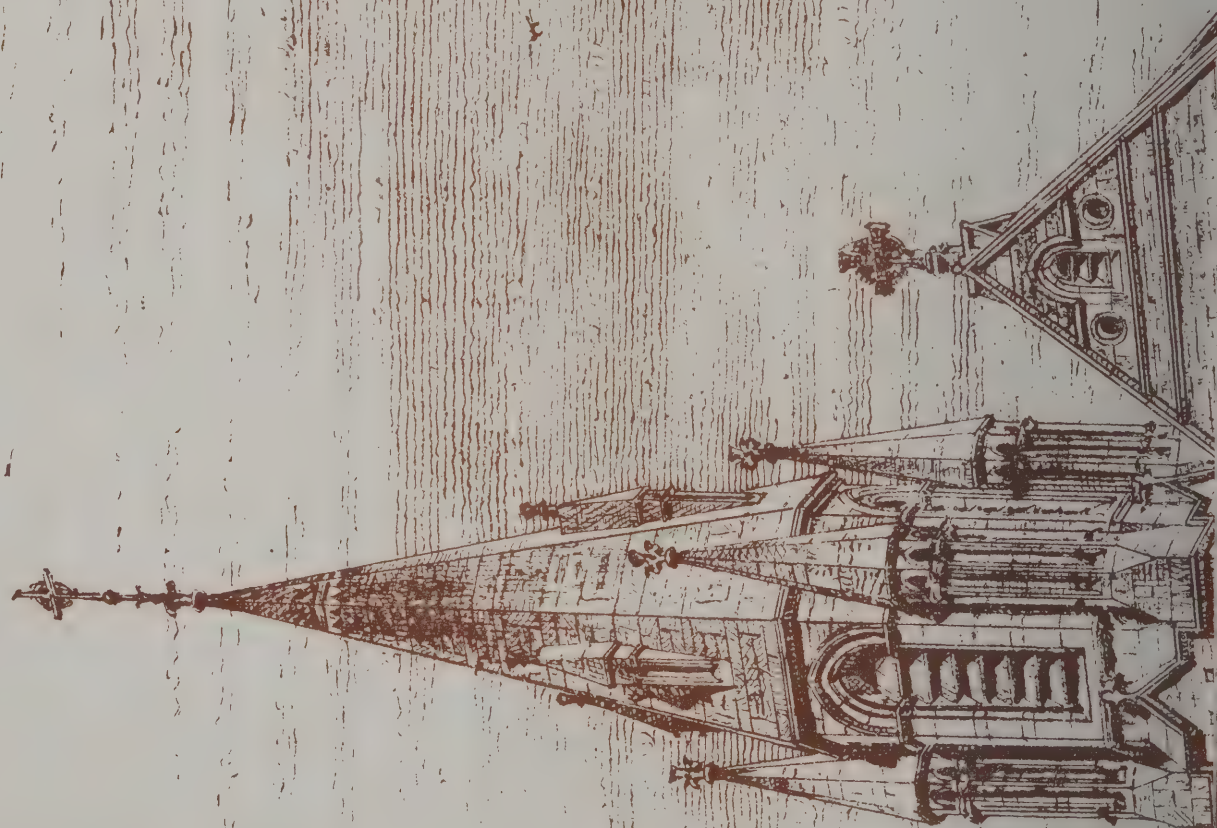


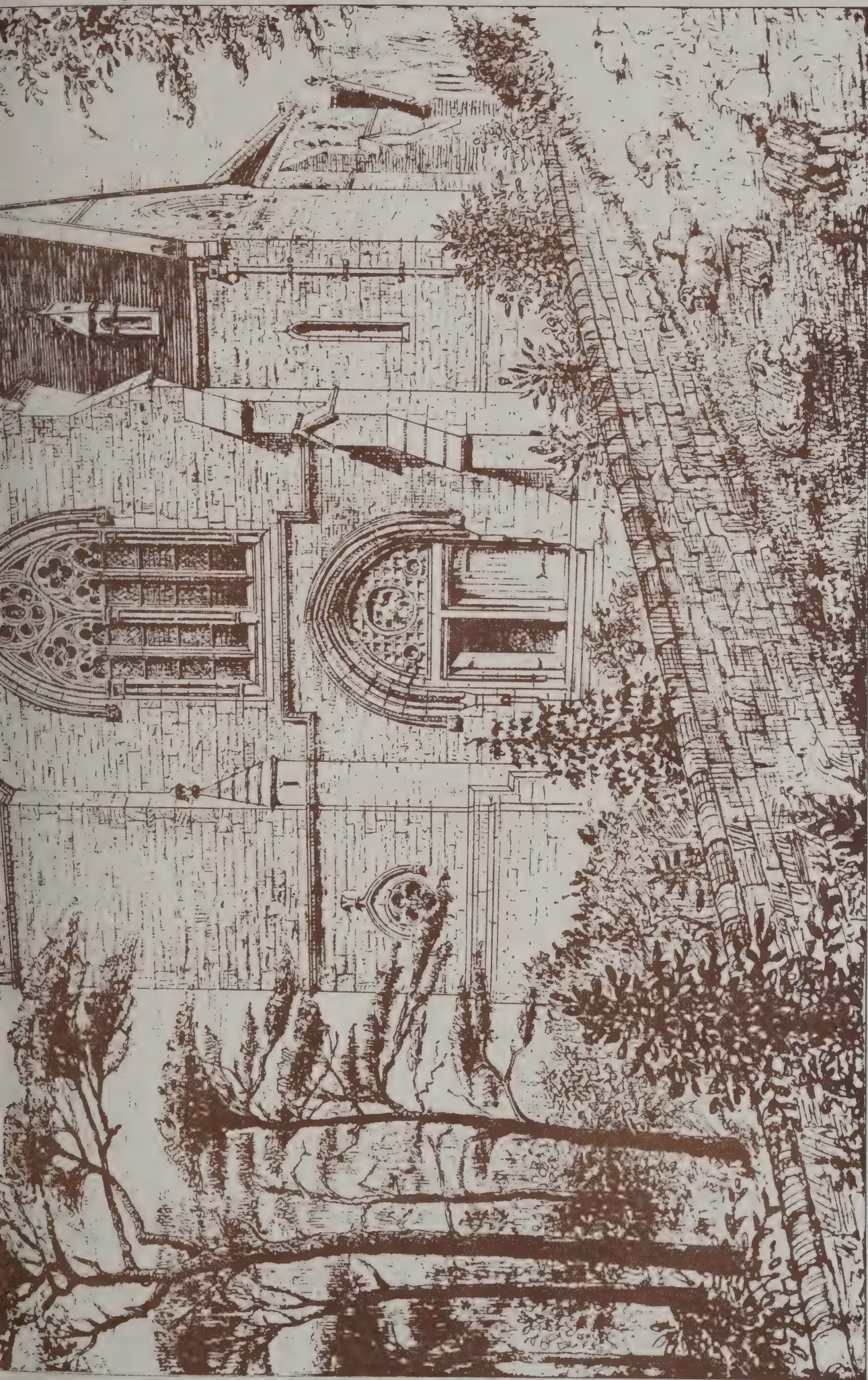
THE COTTAGE, N.
B. VAUGHAN



INK PHOTO. SPHACILE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

Chie Architect, June 2nd 1893.





UNITED PRESBYTERIAN CHURCH, WEST CALDER, N.B.

JAS. G. FAIRLEY, F.R.I.B.A., Architect.





ILLUSTRATIONS.

THE COTTAGE, WALTON HEATH, SURREY.*

THIS is an addition to, and rebuilding of, an old house. The materials of the new part are red bricks and tile hangings, the stonework being in Monk's Park and Corsham stone. The joinery in the hall and billiard-room is in oak. The architect was Mr. B. VAUGHAN JOHNSON, M.A., and the contractors were Messrs. SYME & DUNCAN, of Beckenham.

UNITED PRESBYTERIAN CHURCH, WEST CALDER, N.B.

OUR illustration shows the village church which has been built from the design of Mr. JAS. G. FAIRLEY, F.R.I.B.A., architect. A water-colour drawing of it was exhibited in the Royal Scottish Academy this year.

NEW COMMERCIAL PREMISES, LIVERPOOL.

THIS building is proposed to be erected in Water Street, Liverpool, and will be adapted for large, well-lighted offices suitable for shipping firms. The staircase, which is to be of stone and of circular form, encloses a hydraulic passenger lift. The walls of corridor and staircase will be tiled. The front elevation is to be of Cefn stone, with granite bases. The architect is Mr. W. AUBREY THOMAS.

* From a photograph by Messrs. BEDFORD LEMERE & Co.

ARCHITECTURAL ASSOCIATION SOIREE.

Production of a new and original Medley, in a Prologue and Two Acts, by Theo. Moore and Ernest Rüntz. Played for the first (and last) time at the Westminster Town Hall on Wednesday, May 17, 1893.

"MYTHOLOGY RUN MAD; OR, LES CHUMPS DE MARS."

[BY A CORRESPONDENT.]

(Concluded from page 338.)

ACT I.

THE first scene in the planet Mars shows a rampart of the Acropolis with the bay in the distance, on the shores of which are seen a Greek temple with the Eiffel Tower and a regulation pier. Venus, as a statue, was in the foreground. The presence of the Parthenon in Mars is explained by Pheidias, who thus addresses Zeus:—

I am old,
And Pericles would not with ooftish part,
So here I brought it piecemeal in a cart.
A music-hall I mean to have it now,
Instead of a psalm-smiting shop for thou,
So take some shares.

Zeus declines to take shares, and Pheidias then sings:—

(Air—"The Swanee River.")

PHE.: Way down in Athens I shall never spend happy days;
There's where my temple stands for ever, 'neath gen'rous Sol's bright rays.

All up and down the whole planet-ation sadly I'll roam,
Seeking the sculpture of my own creation, far has it gone from home.
Oh! the walls look sad and dreary, bare the tym-pa-num,
And my lovely frieze of Grecian gee-gees rests in a mu-se-um.

Venus descends from her pedestal, and dances with infinite grace and abandon "a modern dance"—that is, a skirt dance.

Then Sir Christopher Wren and Gwilt enter and discuss:—

WREN. We are at issue about the Parthenon freize. I hold they represent a procession in honour of Athena.

GWILT. And I say they represent the Lord Mayor's Show, and can bring Germans and Americans to prove it.

PHEI. Well, as I, Pheidias, had something to do with it, perhaps you will allow me to say that Sir Christopher's right.

GWILT. Oh! you're mistaken. We have discovered a lot since your time. We change the plans of the Acropolis once a week. You evidently haven't read my book on the subject, ch. 4,021, p. 39,684.

PHEI. I have been spared that honour.

SIR CHRISTOPHER WREN.

(Air—"The Flight of Ages.")

I built a church, a Queen Anne church,
Two centuries ago,
When labour was much cheaper
And the price of stone was low,

And so long as Home Rule's averted
St. Paul's will stand in state
Quite safe from old . . . 's hand,
And poor St. Olave's fate.
There lived a king—Charles was his name—
I served him years ago.
Surveyor-General he made me.
(Architects would call this low, (Aside):
Infra dig. and non-artistic, they'd say he's on the make,
But surveyor notwithstanding, my buildings take the cake.)
(With pride.)

I've had the hump these last two years
Through watching earth afar,
For artists are not as of yore,
And greed and quarrels mar
That which in former years was deemed
A tenet and a part
Is absent, and the charm has gone
For brotherhood in art.
It is a link which seems to me
Should bind us soul to soul.
Shall bitter words much longer hide
From view the common goal?
Memorialists may sniff and sneer,
And Institutes may bray,
But for Auld Lang Syne and Art's advance
Just put this feud away.

Presently the Lightning Streak Express arrives with the A. A. party, under the guidance of Mercury and Cupid. Introductions and flirtations ensue, and then the subscription list opens for the Royal Parthenon Hall of Varieties. All have shares except Cocktail, who decides to "come in in the reconstruction."

ACT II.

The second act opens on another part of the rampart, the Parthenon columns and steps being seen in moonlight. Josephine enters and sings.

Zeus and Mrs. Moriarty, Venus and Leonard, form a couple of pairs of lovers, when the Arcadian love scene is interrupted by a wrangle across the footlights between the authors and the conductor of the band, so realistic in character that many of the audience start for their hats. However, it's all in the book, so harmony is restored, and Leonard sings a new and original song (written and composed by Mr. Rüntz).

SERENADE. LEONARD.

(Air—"Since I first met Thee.")

I.

Since I first met thee, now long years ago,
Thy presence in my soul hath ever dwelt,
And with the years thy form doth dearer grow.
Mine eyes, when meeting thine, now melt with tears of love.
And with the years thy form doth dearer grow,
Mine eyes, when meeting thine, now melt with tender tears of love.

II.

And after weary waiting, though 'suaged the time
By fitful glimpses of thy dear, sweet face,
I now can clasp thee to this heart as mine,
And of the weary waiting time there is no trace.
I now can clasp thee to this heart as mine,
Forgetting all, so great the joy, so great the joy of thee.

III.

May we for ever, linked in bonds of love,
Enjoy the pleasures due to constant hearts.
Awake at last, we pray that Heav'n above
Approves, and death that parts asunder pass us by.
And if, perchance, when looking in thy face,
A cloud should rise, that I have one regret,
Then fold me in thine arms, in fond embrace,
And bid me bless the day, the day we ever met,
Then fold me in thine arms in fond embrace,
And bid me bless the day I met to love and cherish thee.

Zeus then enters and announces that the company is floated and a rehearsal follows by the Sisters Jilt'em (Mercury and Cupid), who dance and sing in capital burlesque of music hall style.

Duet and Dance.—MERCURY and CUPID as the Sisters Jilt'em.

(Air—"Dada wouldn't buy me a Bow-wow.")

I.

We love to twirl our tootsies and to kick towards the sky,
We are the rage upon the stage. McDougall says, "Oh, my!
I cannot stop these naughty chits from flinging high their toes.
What Mrs. M. would say to them—well—goodness only knows."
For we sing old Jimmy Fawn's song of Ju-jah, of Ju-jah,
And Lottie Collins' lunatic Ta-ra-ra, Ta-ra-ra,
"Where did you get that hat?"
And such famous songs as that,
With choruses composed of Tra-la-la-la,
(Repeat) And the chorus ends with tral-la-la.

II.

To Covent Garden Balls we go, high jinks they there allow,
And frequently we end the dance by joining in a row.
The language that we scatter is enough to raise the roof,
The Johnnies seem to like it—and—we're sure we like their roof.
So with simple little songs such as Bow-wow, as Bow-wow,
We entice and mash all comers till they vow-vow, they vow-vow.
They'd love with us to chat,
At the stage-door on the mat,
But of course Mama such things will not allow-low.
(Repeat last line) Which of course Mama will not allow.

III.

So if by architectural work you cannot pay your way,
Well, chuck it out, take to the 'Alls, large salaries they pay;
With cheek and with a voice like bricks to shout out vulgar rot,
You're sure to please and at your ease will scoop a blooming pot.
To the Dog's Home you must go and learn to Bow-wow, to Bow-wow,
There's a lot of "actuality" in Bow-wow, in Bow-wow.
Should your friends shout "Cave canem!"
And chuck mud, you mustn't blame 'em;
Quite classy is this song of Bow-wow-wow-wow,
(Repeat) For it pays to sing the song Bow-wow.

Another "turn" is rehearsed by Mercury as Gravelldow, the strong man, in which the posturing and affectation of this kind of "artiste" are excellently satirised.

After this business the trial of the divorce case, *Zeus v. Venus* (Leonard Aloysius co-respondent), comes on. Zeus as plaintiff, being prevented from sitting as judge, Cocktail is elected to that position; but, before proceeding with the *cause célèbre*, takes other minor cases. First, *Moriarty v. Gwilt*. "Murder of Moriarty's first husband. Deceased met his death by reading prisoner's book when sober." The trial is sharp and short, and Gwilt receives sentence.

Wyatt Papworth is your doom, him shall you revise,
And make your book less valuable and twice its size.

The next case is an ancient-light action, and the position is explained by Gwilt thus:—

There is a bitter warfare
Now raging down below,
And noodles blink and sling their ink,
And mud and curses throw.
But Artists in Art's service
Did not so scarp and scold,
Nor snarl and bite, nor yell and fight,
In the brave days of old.

Then none was for a faction,
Then all were for their Art,
Then the Craftsmen helped each other
And heart communed with heart.
Then jobs were fairly portioned,
Then all were in one fold,
Oh! Architects were brothers,
In the brave days of old.

Now Surveyor is to Art-man
More hateful than a foe,
And Surveyors bite the thumb
And the Art-men scream and crow.
And hot in these polemics,
In working we grow cold,
Wherefore men build not as they built
In the brave days of old.

This case is dismissed, and then comes the great trial of *Zeus v. Venus*, which Pheidias thus introduces:—

SONG. PHEIDIAS.

(Air—"I heard a Voice.")

I.

I heard a case long years ago,
A case where "wifey" tried to show,
With tearful eye and ruby nose,
How she and "hubby" came to blows.
Said she: "He comes home late at night,
And frequently is hoodman, quite;
He whispers huskily, 'My shlove,'
And from the mat declines to move.
Oh! my Lud, he riles me so,
My heart with grief will overflow;
And oh! my Lud, just bid him go,
Please change him for another chap I know."

II.

With Ancient Lights the Courts down there
Expend much time, and light and air
Oft leads to affidavits bold,
Composed of "whoppers" I've been told.
Oh! Architects, more careful be,
Cling to the truth, forget the fee,
Integrity and right uphold,
Your character prefer to gold.

Oh! Architects, I'd have you know
That to a place most warm you'll go;
If facts you stretch a case to prove,
With lawyers there (*points down*) you'll go, and not above.

Zeus gets ten shillings or fourteen days, and in revenge brings a thunderbolt on to the Parthenon, when the columns and walls fall and the steps are heaved up, and chaos and thunder reign.

The various parties endeavour to mollify the irate Zeus in a quintette:—

We feel, oh! dear, the end is near. Mighty Zeus we all distrust;
These verdicts have displeased him, and this show he means to bust.
Oh, Zeus! great host, on our knees we implore that from this you will refrain,
And never, ah! never, shall Architects roam to this beastly star again.

PHEIDIAS. Ah! never, ah! never, shall Architects roam,
ALL. Never again will roam to the planet Mars again.

Zeus relents and all is peace. The A.A. have had enough of Mars and back return singing.

SONG. SIR CHRISTOPHER WREN.

(Air—"Glory and Love to the Men of Old.")

I.

Glory to those Architects of old,
Whose sons have copied their virtues bold,
Courage with Art and with pen in hand,
Ready to work and ready to vie a Master's hand.
Chums—we're willing to dare every chance that's known.
Competitions, if fair,
Are the field for some,
We for premiums try and we won't be last;
Altho' but by one, a job can be won, a place gives us caste.

Chorus.

Glory to all Architects of old!
Boys, strive to copy their virtues bold,
Jealous of Art, surveys we will not eschew.
Ready to fight for linking the two.

II.

Now to accomplish fame,
This controversy's fiery strife should be all over,
Lest—and Architects should toil as tho' its glamour ne'er had come,
Many a student here is waiting anxiously and vainly to discover,
And many a heart must fail and brow grow pale,
To hear memorialists adjure us to succumb,
But don't bemoan,
Surveys we own,
Help keep our home,
But art alone
Gives

Chorus.

Glory to Architects new and old!
Our sons shall not be left in the cold.
Courage! we'll surveys and Art enlist,
And ready to work we'll try to exist.
This rot about Art won't be missed,
Much less a memorialist.
We're ready to work to exist.

FINALE.

(Air—"The Man in the Moon.")

So we'll now bid farewell to old Mars,
For we've seen quite enough of the stars;
As its shores are so bright
You may perhaps think it right
For the A.A. to charge you a bob for the sight.
So now home to your Mama's and Pa's
You may go with our love and ta-tas,
And we hope that we're right
In conclusion to-night
That you relish the trip up to Mars,
You've enjoyed this excursion to Mars.

Jos. enters and sings.

(Air—Chorus of "Man in the Moon.")

I'm in love with this man up in Mars,
He is one of the planets chief stars.
He is quite gone on me,
And I'm sure you'll agree
He's a wonderful help to our Societee.
By the swiftest of railway cars
I've taken this journey to Mars.
There's a terrible dearth
Of young fellows on earth,
But I've found such a nice one in Mars
That I'll marry this man up in Mars.

At end of song exit humming refrain.

Thus ends the play, and so, Mr. Editor, we go home to bed, vastly pleased with our entertainment, but thinking that England, with an occasional turn on the Continent, is a good

enough field for A.A. excursions. Need I say that the show being run by the A.A. Lyric Club, the actors proved an exceptionally strong cast, the parts filled being:—Zeus (a thundering gay old Deg), Mr. F. T. W. Miller; Pheidias (a reformed Memorialist), Mr. A. C. Bulmer Booth; Sir Christopher Wren (warmed up for the occasion), Mr. J. Dixon Butler; Joseph Gwilt (a confounded Nuisance), Mr. F. W. Marks;

Mr. Theo. Moore; Josephine (a *vingtième siècle* party, sister to Leonard), Mr. H. Seton Morris.

The authors are to be congratulated on finding a fresh *motif* for the Annual Play and for the even distribution of fun, life and merry jest throughout, so that the action never once flags, while skilful distribution of light and shade obviates all chance of tediousness. Much praise is due to the stage-



Mercury (a recently deceased Architectural Policeman—Valet to Jove), Mr. P. J. Sutton; Cupid (Page-boy to Venus), Mr. F. Lindsay Sutton; Venus (a study in *confessions*), Mr. Frank Galsworthy; Leonard Aloysius (a Poetic Craftsman, nephew to Mrs. Moriarty), Mr. Ernest Rüntz; Jonathan Gin Cocktail (a Chicago Entrepreneur), Mr. C. H. Brodie; Mrs. Moriarty (of County Dublin, Mother to Venus),

management of Mr. G. Richards Julian and the scene-painting of Mr. Percy D. Smith, whose versatility enabled him also to wield the conductor's *bâton* with capital effect. Our block is from an excellent photograph, taken by Mr. S. H. R. Salmon, of Putney. The electric lighting was carried out in an excellent manner by the well-known firm of William Sugg & Co., of Vincent Works, Westminster, S.W.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary meeting of the Association was held on Friday evening, Mr. H. O. Cresswell, president, in the chair.

House List, 1893-94.

The result of the elections was announced as follows:—

President.—E. W. Mountford.

Vice-Presidents.—W. D. Caröe and E. S. Gale.

Committee.—J. Begg, A. C. B. Booth, H. O. Cresswell, A. W. Earle, F. R. Farrow, Theo. Moore, E. A. Rüntz, W. H. Seth Smith, P. Waterhouse and E. Woodthorpe.

Hon. Treasurer.—H. W. Pratt.

Hon. Librarian.—J. W. Stonhold.

Hon. Secretaries.—F. J. W. Goldsmith and B. F. Fletcher.

Hon. Solicitor.—W. H. Jamieson.

Hon. Assistant Librarians.—C. H. Freeman and W. M. Paton.

Hon. Auditors.—B. Dicksee and G. A. Lansdowne.

Assistant Secretary and Registrar.—D. G. Driver.

Mr. SLADDIN read the following paper:—

Travelling Student's Notes.

Mr. Sladdin said:—Having been awarded the Travelling Studentship, I consulted some authorities, and decided upon Norfolk as my field for operations.

I find when the time comes to read the paper that choosing such a well-known county makes it very difficult to say much that is not already known to most of you, so that you will find this but a brief outline of my tour.

I may say here that my tour was made the more pleasant by having two friends with me most of the time, consequently throughout the paper I am constantly using the plural pronoun we—and I must take this opportunity to thank Mr. Newton for allowing me to add some of his sketches to my own in order to more fully illustrate my remarks.

Norwich was my first stopping-place, and I must say that my feelings on first seeing it were those of disappointment at the insignificant situation the cathedral occupied; it seems difficult to understand why the founders did not select a more imposing site—such as the high ground which rises directly on the other side of the river—in fact, the only spot from which a really good view of it can be obtained is from the river opposite a delightfully picturesque old fifteenth-century archway known as Pulls Ferry. The fine outline of the tower and spire is here seen to advantage, although a closer inspection discloses some hideous detail.

Those who have seen Norwich Cathedral will agree with me that the finest part is undoubtedly the interior. Entering from the west end, which externally is so poor in design, one is at once impressed by the magnificent range of Norman arcading and perpendicular vaulting. The choir, which is of great length, has some exceedingly fine stalls, good examples of fifteenth-century woodwork.

The whole of the east end, including the choir, was undergoing restoration, and I was grieved to notice, particularly in the south transept, that the stonework was being scraped down, and the mellowing effect of ages was being totally destroyed.

In the south aisle of the chancel is a most beautiful font in rather a mutilated condition. The carving in the panels represents the Seven Sacraments and the Crucifixion. The way in which the small shafts are treated, running up under the body of the font, with angels filling up the space between, is very pleasing, and to my mind the whole design is most happy. It belonged at one time to the church of St. Mary in the Marsh, a church that has now been demolished some years. The people of this parish, curiously enough, are allowed to use one of the two chapels in this aisle as their place of worship.

The other chapel in the south aisle is the Beauchamp Chapel, used now as the Consistory Court. It has in it a fine shrine of that period when Perpendicular was at its best.

South of the cathedral, and reached from the south aisle of the nave, are the well-known and much admired cloisters. I have no time in a paper of this length to describe them, but any students visiting Norwich will find them well worthy of careful study.

It may interest you to know that a charge of 4s. 6d. a week is made for sketching in the cathedral. I think this is a case for our secretary.

Turning our attention now from the cathedral. On the upper side of the extensive market-place, and hemmed in on all sides by old houses, stands the fine Perpendicular church of St. Peter Mancroft, restored some years ago by the late Mr. Street. This is one of the few churches in Norwich that is not faced with flint work, and like several others in this district has its clerestory windows very close together, two over each nave arch.

The church has numerous interesting features inside, the

most noticeable one being the baptistery near the north porch, which has lately been most admirably restored by our late president, Mr. Baggallay. The entrance lobby, of which I have measured drawings, is in the south transept, and has a carved frieze unusually fine in design.

In the small church of St. George Tombland is a very remarkable font and cover; the measured drawings which I am able to show you have been kindly lent by Mr. Newton. The outline of the sturdy little granite font gives one at first the impression of its being of pre-Norman times, but the pointed arched heads to the shallow panels on the body of the font, fix its date, I think, to the early part of the twelfth century. The cover is late Jacobean, and seen in perspective the whole thing is exceedingly picturesque. In the church at Knapton there is a font identical in design, though slightly larger.

In the same church is an oak pulpit with sounding-board over; it formerly stood on wooden posts, but unfortunately no trace of these remain, and at present the pulpit stands on a hideously modern solid base. The small staircase has some very delicately moulded balusters; but perhaps the most noticeable point about the pulpit is the ivory inlay, which is profusely used in the panels and soffit of sounding-board. Such work is rare in England at least.

This wooden screen is in one of the chief churches of Norwich, called St. Andrew, Broad Street. The west tower is open towards the nave, and this screen stretches across the opening and reaches from the nave floor up to the ringing chamber in the tower. From the time of the Reformation, and, I believe, until recently, it was covered over with lath and plaster; when uncovered it must have been in a very dilapidated condition, because all the present mullions and panelling in lower part are new, only the old jambs and tracery over remaining. Unfortunately, when the screen underwent restoration, by some mistake its original height was reduced by a foot. In my measured drawing of it the error is rectified.

The chief landmark in Norwich is the castle, standing as it does on a tremendous mound. It is supposed to have been built in 1020, but externally little remains by which one may judge, the whole of the present outside casing being about fifty years old. From the terrace, which runs all round, a good view is obtained of the city, and some idea can be formed of the great number of churches it contains.

In all directions their towers can be seen peeping up above the trees, which abound everywhere. One is immediately struck by the great similarity of design between all these towers, which is still more observable on closer inspection. This sameness, of course, detracts greatly from their interest, and, indeed, a visit to two or three of the forty churches of Norwich will be found amply sufficient to gain a general knowledge of their characteristics.

There are numerous places of interest within easy walking distance of Norwich. Some of these I visited. Thorpe, I think, is the nearest. This straggling village is very pleasantly situated on the river, east of the city on the Yarmouth road. The old hall was built on the site of a bishop's palace, and is a sleepy-looking old house with a very pleasant garden surrounding it. We took a boat here, and by going with the stream for about three-quarters of a mile we reached a half-timbered house, nicknamed by the wherry-men the "Monkey House." It is occupied by the people who have charge of the ferry at this spot, and I thought quite merited a sketch.

Not far from Norwich, but in the north-west direction, and also on the river, is an interesting old Elizabethan house. It was once the palace of Bishop Hall, built in 1587, but is now used for quite a different purpose, being known as the Dolphin Inn. It stands some distance back from the road, with square courtyard in front. The entrance gates are gone, but the large gate piers still remain. I had intended bringing away some record of the front, but unfortunately the weather at the time was not favourable for outside work, and I had to content myself with sketching the ceiling in the bar parlour.

A mile or so further on is the diminutive village of Hellesdon, with a church in proportion, but I saw nothing very noteworthy.

At Costessy, which is in the same direction, but about five miles from Norwich, is the seat of Lord Stafford. I was extremely curious to see the house, as my guide-book laid particular stress upon the beautiful chapel, which was designed by one of the family, but I was not fortunate enough to gain admission. The church, however, well repaid the journey. It is Late Decorated, with good altar-screen and some curious Transitional windows. For a water-colour study it would form a good subject, with its brick tower and wooden spire.

From Norwich we went to North Walsham, which forms a capital centre for reaching such places as Trunch, Knapton and others which have no railway communication.

The only drawing I made in North Walsham was of the wooden font cover which is suspended from a beam across one of the nave arches.

Trunch is a three and a half mile walk from North Walsham, and, as in most of the villages I saw, the church was the chief

attraction. It has a splendid hammer-beam roof, which is so well known as to need no description of mine. The baptistery, which is of wood, is in marvellous preservation, and is certainly one of the best things we saw; it is of very similar character to that in St. Peter's Mancroft.

Knapton is about the same distance from North Walsham, and is famous for not having refreshment for "man or beast." The church itself is like a large empty box, but the roof is exceedingly fine. I attempted a sketch of the roof, but not being very successful, and feeling for once rather slack, and being very near the coast, I walked on to Mundesley, a quiet little watering-place not boasting any railway communication, but I must in fairness say that it is possible to get something to eat here.

The church—St. Mary's—is in a very ruined state, but the tower has been lowered and roofed in, and is now used for service. We had a pleasant coach-ride back to North Walsham.

Whilst staying at North Walsham, we spent one day at Worsted, which is a particularly pleasant walk. The village now is a mere shadow of its former importance, but fortunately the magnificent church still remains a monument to the former wealth and liberality of the Flemish inhabitants. I am sorry to say that the church is now neglected; it is very dirty, and the roof does not fulfil its purpose. I have sketches of the south porch and nave roof, and one of Mr. Newton's of the western screen between tower and nave.

Our next move was to Aylsham, the leading town in this part of the county. The church is of considerable size, and still retains traces of its former interest, in spite of the most thorough restoration:—

You may break, you may shatter the vase as you will,
But the scent of the roses will cling to it still.

In the restoration of the church the upper part of the old chancel screen was removed, and now does duty as a reredos. I am glad to say the lower part still remains in its old position, and is noticeable for its delicate Gesso work. The proportions of the church, to my mind, were totally destroyed at the same time by the introduction of solid backed pews, which are everywhere sprinkled with tasteless carving.

The font is of great interest. The eight sides are filled with sculpture representing the emblems of the Passion, the four Evangelists and the Crucifixion. Carved on the base are the arms of the founder of the church, John of Gaunt, inserted in richly-traceried panels. This font owes its splendid state of preservation to the fact that, until lately, it was hidden from view under a mass of rubbish in one of the aisles.

Another good feature in the church is the ringing gallery under the western tower, which seems to be a general arrangement in Norfolk. This gallery is supported on wooden posts from which spring arches, the spandrels being filled with delicate tracery, and the whole retains its original colouring. The fine old Early English hinges at the western entrance do not benefit by being attached to painfully new doors. The tracery in the windows shows an extraordinary amount of variety, and adds greatly to the interest.

The pulpit is a typical example of Jacobean woodwork, with its panels in false perspective. The stairs are a recent addition, and are the best modern work in the church.

The exterior is a charming example of a characteristically English church, rising, as it does, from the greenest turf, and backed by magnificent cedars. The south porch, which was quite the finest I saw in my tour, is worthy of close study, not only on account of the beauty of its proportions, but also for the refinements of its mouldings.

Aylsham contains more than the usual amount of that delightfully quiet domestic work, the charm of which is largely to be attributed to the hand of time.

The end of my tour was spent at Blickling, which is a tiny village clustering round the gates of Blickling Hall, the magnificent seat of the Marquis of Lothian. No words of mine can convey the exquisite charm of this stately home. The approach to the house lies between yew hedges 15 feet high, which are clipped with marvellous precision. The upper part of this forecourt is flanked by low wings, the one on the left containing the kitchens, and that on the right the stables; these are connected to the house by colonnaded screens.

The house forms an oblong on plan, the corners being accentuated by towers; it is surrounded by a moat, which is now dry and laid out with flower-beds. To enter the house you cross a bridge and pass through a massive door into a small inner court, out of which open the grand hall and staircase, so well known. The iron knocker on this door I have just mentioned is a unique specimen as far as my experience goes. Worked into the design is the Bull's Head—the crest of the "Kerrs"—which also appears in other positions in the building, and forms a valuable precedent for the treatment of armorial bearings in a decorative way.

Proceeding to the first floor, the doors at each end of the gallery, which lead to the State apartments and bedrooms

respectively, are worthy of study. As will be seen in my sketch, the stonework is very cleverly treated, and the carving has a marked resemblance to foreign work of the same period.

The ante-room to which one of these leads is a square apartment, the ceiling of which is more severely treated than any of the others, as will be seen from the plan. The transition from the square to the octagon is skilfully managed. This room is one of those which overlooks the wonderful garden, which, when seen ablaze with flowers, under a summer sun, will not be readily forgotten. This ante-room opens on one side into the State drawing-room, the most noticeable feature of which is the impressive chimney-piece (sketch); the proportion of this is very fine—the rich colour of the woodwork blending very harmoniously with the delicate white of the elaborate plaster ceiling. This room contains a wealth of art in the shape of furniture and portraits of notable people by notable artists.

The other room opening out of the ante-room before mentioned is the library, a noble apartment 120 feet in length, sadly spoilt by the introduction of a rabid Gothic hooded chimney-piece and equally unpleasing bookcases, which do not in the least harmonise with the character of the room. I was informed that to make way for these alterations a splendid Jacobean chimney-piece was removed, which was at once bought by a well-known art collector and re-erected in his own country house. Lately restorations have happily been unattended by such disastrous results. The ceiling in this room is also of marvellous richness, a perfect mine of ideas, the ceiling in each projecting bay window being very freely treated with strap-work ornament, birds, flowers and fruit carved with all that vigorous spirit peculiar to this period when plaster-work probably attained its highest development.

The modern stained-glass inserted in the window at the end of the room compares favourably with much of later date. Before leaving this room mention may be made of the noble collection of books, one of the finest in England, and which are very jealously treasured.

At the end of the library a door leads into the suite of apartments furnished in honour of a visit of one of the Georges, and presenting a most interesting contrast to the sturdy vigour of the other part of the house; being of that weak but delicate style known as the Adam's period, which is so much studied by some of our rising men at present. The further apartment contains the king's bed, and some other excellent pieces of furniture.

To mention in detail the many other features of this fine old mansion would dip too deeply into your time, which I know you require for the pressing business of the evening; but I may tell you that some of the most pleasurable moments of my tour were spent when I was making the sketch of the entrance front. At the close of the afternoon, when the sun slowly sank to rest "and all the air a solemn stillness held," the opalescent tints of the sky, combined with the mellow old brickwork and varied shades of green in the trees and grass, softened in the fading light, to make up a picture infinitely precious to the jaded London draughtsman. At such moments my feelings of gratitude towards the Architectural Association were very lively. My thanks are also due to Lady Lothian for her extremely kind permission to sketch both inside and outside the house.

The interest of the hall so overshadows that of the church that I need only mention the latter briefly.

It was fully restored by the late Mr. Street, who also added the tower. The interior contains some good brasses, and the curious Clere Monument, with its numerous fictitious coats-of-arms.

The late Marquis of Lothian's monument (his reclining figure supported by angels) is a magnificent piece of sculpture by Watts, R.A.; it is a pity that the immense block of marble is veined in places.

The country round Blickling abounds in interest, but I deemed it better to confine myself to the thorough study of one place than to roam about the country getting rapid impressions and making hurried sketches. One Sunday I walked out to see Barningham Hall, which lies in lovely country, and is considered an admirable example of that late seventeenth-century work which has been reproduced with such success by that accomplished architect, Mr. Ernest George. Some distance from the house are the remains of a Late Decorated church, which curiously enough have to be passed through to enter the present church. Walking back I observed the fine tower of Erpingham Church, which I was unfortunately unable to enter. I was astonished to see the name of Cardinal Wolsey on a tombstone in the churchyard, as I had not known that that famous prelate was buried in this out-of-the-way spot. But on further examination I discovered that half the occupants of the churchyard had borne the name of Wolsey in life, and that the "Cardinal" in this case was only a christian name conferred on her offspring by some ambitious mother who wished to render her son immortal.

It was with feelings of regret that we bade adieu to the hospitable host of the "Blickling Arms," who with his charming

daughters did so much to render our stay under their roof an enjoyable one.

Norfolk people, in my opinion, bear off the palm for genuine hospitality. I was everywhere treated with unfailing kindness, and every facility put in my way for the proper study of our noble art.

I have noticed with pleasure that the A.A. excursion this summer starts from Beccles, which is within easy range of the district I have traversed to-night, and I feel that my paper will not have been altogether in vain if it should induce any member who has not already decided to take part in it this year to do so at once.

In conclusion, gentlemen, I have only to express my thanks for the great honour you conferred upon me by giving me the studentship, which, besides affording me the pleasantest of holidays, has been to me an invaluable opportunity of study, and however imperfect my efforts may appear, I can assure you I have striven to the utmost to make profitable use of my time.

Mr. MILLARD proposed a vote of thanks to Mr. Sladding for his paper. He noticed that no allusion had been made to the new Roman Catholic Cathedral at Norwich, the work of a distinguished architect. Possibly Mr. Sladding thought he should confine his remarks to old work. In a sketching-tour Mr. Millard said what to sketch was more important than the actual execution of sketches. The Association did more in the way of architectural education indoors than out of doors. They arranged for one travelling studentship a year. He would like to see a dozen founded.

Mr. WONNACOTT seconded the vote, which was supported by Mr. Newton.

The PRESIDENT put the vote of thanks to the meeting, which was carried by acclamation.

Mr. SLADDING, in acknowledging the compliment, said he had originally intended to refer to Mr. Scott's church at Norwich. The site was a splendid one, the very best in Norwich, but the windows were shallow and the mouldings too much like cast-iron.

PRIMITIVE ART IN EGYPT.*

THE earliest condition of art in Egypt stands in a far different light to that of the history of art in other countries. In the first place, it is as early as, or earlier than, any other source of art that we know. Other countries have largely borrowed from Egypt and from Mesopotamia; but these two great deltas have not had any external influence acting on them; they stood far in advance of the civilisation of the rest of the world in the early ages, and their art appears to be the outcome of the first stable and well-organised governments that were known.

Tranquillity and the command of large resources were needful before any great progress could be made in architecture or the imitative arts; and no land appears to have enjoyed such conditions before the dawn of the historical period of Egypt. We have, then, to deal with a state of things in which art was in course of actual organic growth, free from the influence of any external guidance, and with only its own antecedents to build upon.

In another respect it also stands apart, owing to the absence so far of all traces of its origin and rise. We are still as much in ignorance as ever of the course of its development. Where the tentative stages are to be found which led up to the triumphs of Dynasty IV. is, as yet, a mystery. Certain sculptures, which are undoubtedly very early, have been assigned to Dynasties II. and III., solely on account of the style. But there is no absolute evidence of the date of a single sculpture or a single block before the first king of Dynasty IV., Snefru (the predecessor of Khufu, or Cheops), under whom we find some of the most perfect works that ever were executed. The rise and the course of this art are still buried; and it is only by inferences and side-lights that we can at all estimate what came before Dynasty IV.

In one line, however, there are remains of an earlier style. The rock carvings of Upper Egypt certainly date back to a long prehistoric age; an age when the ostrich and elephant were familiar in Egypt. But these rude figures have no relation to the art of historical times; and we should as soon learn the history of the Parthenon from the weapons of the stone age in Greece as trace the Egyptian schools in the rude carvings of the primitive man.

The oldest sculptures that we know are characterised by being in relief, and by the minute care with which the details of the figures and of the hieroglyphics are wrought. These signs, always in relief, are really elaborate sculptures of distinct objects, and not merely images for an idea—more or less simplified—as they became in later times. This general carving in relief has been very happily explained in connection with the idea of expressing messages or records by means of actual

objects; and from the stage of sending a group of symbolic things, such as a bird, a fish, an arrow, a plant or other real articles, tied or attached to a board in a given order, to the stage of making similitude of them in relief, is a shorter step than the next change, when these carvings become worn down into the expression of mere sounds. Hence the system of these earliest high-reliefs, so elaborately finished, really takes us back to the very origin of writing; and in their completion and detail we see the incompleteness of the great invention to which they led.

Similarly the care, the detail, the lifelike expression of the early figures is due to the sincere belief that as images of the man, representing all that he appeared to the eye, the invisible part of him might then find an earthly home as in his actual body during life. Probably the earliest carvings that we know are the wooden panels from the tomb of Hesi, 4000 B.C. The signs are in very high-relief, elaborately cut, and placed together in inexperienced arrangement. The carving of the figures shows the same care of detail. The muscles are fully modelled and exaggerated, and from the exact maintenance of the expression in these figures the face is clearly a careful portrait. The aim was to produce as exact a copy of the man as possible, without omitting any points which could add to the reality of the image.

Yet we see that a certain model was already established, a model which lasted down to the latest times. The face is fixed, the left leg is advanced, and the manner shows that a settled type had been well practised, and that the idea of variation and choice of attitude was already banished. Hence this, as well as the perfection of the technical work, shows the close of a long time of tentative trials, and a long accumulation of experience.

The first thing that a Western observer remarks on the Egyptian pose is that it is an impossible combination according to our ideas. We see the face in profile, the eye full-length, the chest in front view, and the legs sideways. But before we condemn this as contrary to nature, it is well to see what the nature of a modern Egyptian is, and how far our ideas are correct. To avoid all ideas of posing for the subject, I have selected a figure of a boy from a large group, which was photographed without any special aim by a Cairo dealer. In this kneeling figure we see the profile of the face, the eye full, the chest in front view, and the legs sideways. Everything that we have heard condemned as unnatural and impossible in the ancient sculptures is seen in the modern native, without any constraint, and simply taking an easy position. This shows what is the true idea of the conventional Egyptian pose; it is a three-quarter view, modified by the omission of the much foreshortened parts beyond the profile—a simplification which was essential to an outline system of representation.

The earliest figures which can be dated to a fixed reign are the statues of Rahotep and Nefert, belonging to the time of Senefru. These, as among the greatest treasures of the Ghizeh Museum, may be familiar to many; but they are always worth review, as showing the strength of the primitive work. The lifelike treatment, the exact copying of the real person, the individuality, is so natural that we are almost apt to overlook its art. Yet there is not a single statue of later ages in Egypt which can be put by the side of these without appearing crude and lifeless. They belong to the higher types of race in the country; and the vigour of Rahotep, and the placid beauty of Nefert, are very different from the lower races. In the Queen Mertitefs another type is seen, and a different treatment as well. The physiognomy and the manner are both of them much more akin to the primitive Babylonians; and many links appear between the aboriginal Egyptian and the Mesopotamian, which seem to point to a common origin of arts and ideas. This same character is seen in some early statues at Ghizeh, and the physiognomy has an affinity to that of the well-known scribe in the Louvre. He appears to represent a mixed type, between the aboriginal Egyptian and the higher type of invaders who founded the dynastic kingdom.

Descending a couple of reigns, the next important example of the primitive art is the statue of King Khafra. The front view is familiar in many illustrations, its royal dignity and supreme capacity. But the side view gives a very different light on the expression, we there see the bright intelligence and sweetness of the face without losing any of its nobility. The sculptor has succeeded in combining a most complex expression: august dignity without hauteur or coldness; unconquerable firmness, yet with keen intelligence and vivacity; rigid rule with a winning grace; and monumental gravity with an almost humorous smile. Yet this is the earliest royal figure known, and carved in one of the most intractable materials.

Besides work in limestone, as Rahotep and Nefert, and in diorite, as Khafra, the early sculptors deal with wood in the round with great success. Two of the most vivacious portraits they ever carved are the so-called "Shekh-el-Beled," or wooden man, and the figure of his wife. The latter, which is less celebrated, is perhaps the finer piece. The vigour of the pose, the racy expression, and the whole energy of the work are unexcelled.

* A paper read by Professor W. M. Flinders Petrie before the Applied Art Section of the Society of Arts, and published in the Journal.

The figure of the husband, though excellent, has not an equal inspiration of nature. The best point of view is the front face, and we see in that somewhat the same cast of seriousness that overclouds Rahotep. It is noticeable how, in both of these pairs of figures, the sense of responsibility shows in the man's face; while, in the women, the artist has shown a placid satisfaction in one, and an audacious raciness in the other, without any of the more weighty expression.

This type of face is peculiar to the earliest period of work. Any sculpture of this age is unmistakable in the solidity of its style, and the somewhat heavy but very capable expression. A small statue, now at Bologna, for instance, though without any inscription, could not possibly be referred to any later age.

Besides figures at rest, the primitive people often represented workers engaged in daily tasks. The spirited figure of a woman grinding corn (now at Florence) is almost as lifelike as the more ambitious statues which we have noticed; but the expression is here that of attention to a duty, and not the easy indifference of the other women. Other statuettes represent potters moulding jars by hand, exactly such jars as are found hand-made in the workmen's heaps of the pyramid builders. In these men we see the stolidity of the lower and coarser classes, without any of the intelligence and brightness of the higher people. In the statue of the kneeling servant the aim is that of simple submissiveness—humbly waiting, with folded hands, for his master's orders—an air totally different from the decisive manner of the statues of the superiors.

Besides this class of strictly personal portrait sculpture, the early art also excelled in the lesser figures of the attendants and servants carved in the tombs. The original object of the sculpture was religious, as in the portrait statues. In those, by the exact copying of the external man, the soul was provided with a suitable home; and, by the figures of the servants and animals engaged in all the needful processes of ordinary life, the master was assured of the continuance of all those services for his life in the statue. The sequence of ideas is strictly logical, if we once begin by conceding the utility to the soul of the artificial man—or statue—as a residence; though the outcome of the reasoning and the pictorial provision for all the needs of the body seem incongruous at first sight.

These lesser sculptures, like the statuary, are finest in the earliest periods yet known. The theoretical need of exactness and reality was most felt when the efficacy of the figures was most esteemed; and as time passed a less and less exact and careful treatment was thought equally availing, until the rudest scrawl was substituted for the real image. The tomb of Rahotep, at Medum, from which the lifelike statues came which we have already noticed, contained also some of the finest relief sculptures that are known. The larger figures, and those most within reach, have all been ruinously mutilated in the recent years since the tomb was opened; and, indeed, the only method of preserving monuments that has yet proved successful in modern, as in ancient times, is to bury them safely; no guardian is so efficient as 10 feet depth of loose earth. The upper figures are, however, still in good state, and we there see the triumphant fishermen carrying a huge "fighting fish" hung from the oar between them; the spring of their walk and expression of their zeal are excellent. Another scene, of a herdsman leading an addax, shows an entirely different feeling; here he is coaxing it along, partly by force, partly by favour. In the group of fishers drawing a net to land, the idea is simply the steady performance of a heavy duty; but the man who has sat down in the shade of the lotus to split the fish and spread them out to dry is far more leisurely. The animals are treated with as much expression as the human figures; the elastic prowling walk of the leopard and the fugitive manner of the hunted wild dogs are most characteristic. In another group a little boy is supposed to be in charge of a baboon and a monkey; the baboon has, however, secured the boy's wrist, while the monkey is intent on pulling the tail of a crane in front of him, and is just going to be rewarded by a kick of the crane's leg, which is rising. There are few, if any, ancient figures of animals which surpass these in the vivid sense of their peculiarities and action. One of the most celebrated tombs, that of Tih at Sakkara, which belongs to the following dynasty, is far inferior in the delicacy of the work and the power of expression; and this, in turn, is better than any later Egyptian work. We see then, that in each respect, in statuary, in figure reliefs, and animal sculpture, the earliest work yet known in Egypt is emphatically the best, and has a vitality and realism which raises it far above all later efforts.

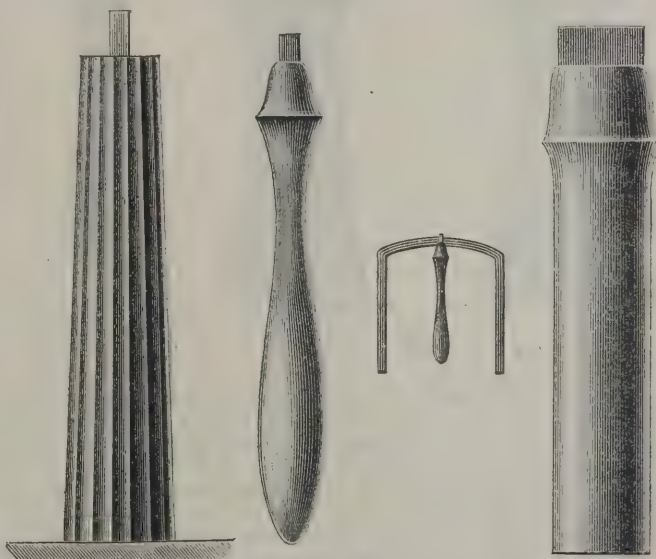
What came before this is the great problem. Where did these artists form this style, which—within its limits—is so technically perfect? Where did they acquire this close observation and feeling? When did the preparatory stages come? Judging by what has since passed, there may have been but a short transit from rude and stiff work to this finest period. In Greece how much passed in one century before Phidias! In Italy how great is the step in one century before Botticelli! So in Egypt, a single century may have bridged

the space from cumbrous efforts to the high pitch at which we find the artist, in the first remains which we can date.

But in one direction we can reach back to the art of the still earlier ages of which no actual remains are yet known. The philologist has formed a sketch of the civilisation of races long before all written record, by the evidence of the words and names embedded in their languages. In the same way we may form a picture of the civilisation of Egypt at the age when writing was developed, and when abstract ideas came to be denoted by figures of symbolic objects. This stage of their civilisation cannot have long preceded the time of the earliest art which we have noticed; as, at that period, the style of the hieroglyphic signs was very elaborate, and they were still regarded as symbolic pictures rather than as arbitrary marks for sounds or ideas.

We learn, then, that at the time of the development of the hieroglyphic writing there were more than the mere elements of civilisation; in fact, a high level is in many respects indicated. The chisel and adze were used, made of metal—doubtless copper—and attached to wooden handles. The two-handled plough was in use, as well as sledges for drawing heavy loads. Games were played on portable game-boards. And while writing was yet being formed, the use of signet cylinders of engraved stone, and the scribe's palette and pen-case, all came into use. We learn that industrial arts and organisation preceded the elaboration of the religion, when we see the high priest of Memphis entitled the "great commander of workmen," the high priest of Mendes the "chief of the soldiers," and the high priest of Sebennytus "the warrior." These are the glimpses of prehistoric Egypt preserved to us in the hieroglyphs and titles.

Most happily we have also thus preserved an outline of the prehistoric architecture. The oldest actual buildings known—besides the Pyramids, which stand apart from all later forms—are two temples, that of Ghizeh, built by Khafra, and that of Medum, built by Senefru. The temple of Khafra—the third king whose works are known—is of extreme simplicity; rectangular halls of red granite with plain walls, only decorated outside by panelled work. This has been taken hitherto as the type and limit of the early architecture. The temple of Senefru—the first king whose works are known—is even simpler. There is no granite, only limestone of the neighbouring hills; there is no ornament whatever, only perfectly plain walls, inside and out. From these it might seem that no decorative efforts had yet touched the profession of building, and that construction was not yet an art. But the



OCTAGONAL COLUMN.
(HIEROGLYPH AT MEDUM.)

LOTUS COLUMN AT MEDUM.
HIEROGLYPH FORM AT MEDUM.
COLUMN AT THEBES, DYN. XVIII.

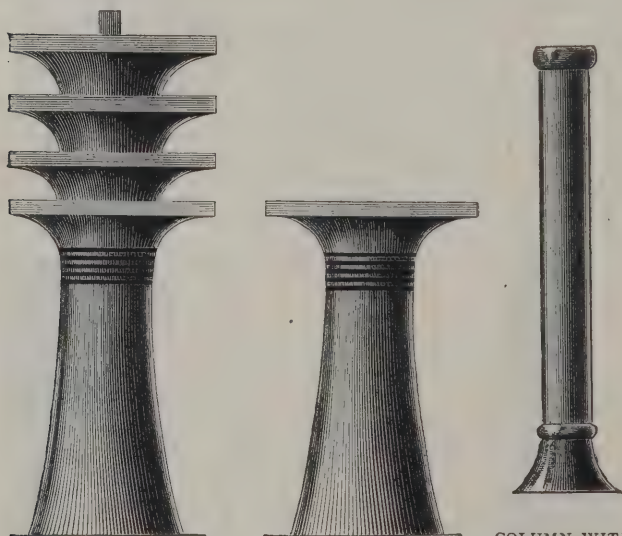
hieroglyphs show how far wrong such a conclusion would be. Contemporary with this earliest and simplest known temple, the inscriptions in these tombs show us that octagonal columns were in use, tapered to the top, and fluted on the sides. These are probably derived from large posts or stems of trees, and are quite as advanced as the well-known columns of the tombs at Beni Hasan, the so-called proto-Doric. Thus we learn that this type belongs to an age when even writing was not yet formed.

Another type of column was also in use, apparently derived from the wooden tent-pole. Being the greatest piece of the tent, it was used in expressing greatness. It has the curious bell top above the lotus flower, which afterwards became developed into the ugly columns of Thothmes III. at Karnak, with a bell capital. This column appears as the central support of a dwelling, in the section view of a booth, which is the hieroglyph for a festival.

Yet another type was in use, with a defined capital. From the banding around the neck of it, it appears to have been first formed of a cluster of some yielding material. Probably it was a bunch of maize stalks tied together, with the tops crushed outward, and then plastered over with mud. It became, however, one of the principal types of the early period; and a row of such columns, seen with the capitals one over the other, became the emblem of stability or firmness. These columns appear in a very curious drawing of a building painted in Dynasty XII.; that shows us a front supported by such columns, crowned with a pediment, borne by a diminishing row of lesser columns filling the tympanum. That this is not merely a sport or stray fancy is certain, from two carvings in the Louvre, one in ivory, the other in wood, which show just such a design copied for small decoration. In the ivory example the window openings in the tympanum are filled with lotus leaves tied together in a manner which is most usual in the Dynasty IV., and it seems not unlikely that this design belongs to the same early period as the first examples of the columns.

All of these types of columns, then, go back to the primitive time of the development of writing, before any of the monuments that we know of as yet. One other feature we can also glean from the same source. The decoration of a cornice with a row of serpents, or cobras, reared up with the hood expanded, was also known in this primitive epoch; and this serpent must already have been used as an emblem before it would be adapted as a symbol on the front of the king's courts of justice.

Leaving this revelation of the unknown age, and coming to the earliest historic period, we find a fourth form of column in use, with a bold capital, a roll at the neck, and a deep torus base. This is sculptured in low relief, on either side of a doorway, but is clearly copied from a column in the round. The source of this form is suggested by a figure of a bowl, placed in a tall, cylindrical stand, which occurs in the same tomb, and which unmistakably resembles it.



COLUMN WITH CAPITAL.

COLUMN WITH
CAPITAL IN
TOMB AT GHIZEH.

The principal remaining type of column—the palm capital—I have not yet found earlier than the Dynasty XII., or about 2500 B.C. Hitherto, it has only been recognised in the Dynasty XVIII., but an ivory carving of the Dynasty XII. shows it completely developed. We can now believe, therefore, that the brilliant granite columns of some temples of this type date back to the Dynasty XII.; and it would be not at all surprising if it proved to be as early a type as any of the other forms of column which we have noticed. The material for it is so abundant and so obvious in the palm groves of Egypt, that it would be strange if it came late in the invention of types. In one point, the palm is among the oldest materials, as the typical cornice of Egypt is derived from the palisade of palm branches, plastered over to form an enclosure, and with the tips left free and curling over, as a fence along the top. Such may be seen now around the courtyard of a peasant, and such was clearly the source of the overhanging ribbed cornice so essential to almost every Egyptian building.

We have now reviewed the primitive art of Egypt, so far as our present knowledge and our recent discoveries enable us to grasp it. The sculpture we, as yet, only touch at its finest development, and the rise of it remains one of the most fascinating historical questions which await solution. The architecture we have been able to trace back to the age of the invention of writing, and we find even then that all the important types of later ages were already in existence. Where the steps which led to this art and this architecture are yet to be found is a mystery. If they existed, in Egypt it seems almost

incredible that they should not yet have been seen anywhere. Some few statues of an extreme simplicity appear to possibly precede those which I have named; but yet there is no trace of any dated remains. Whether the first three dynasties actually reigned in Egypt and filled the centuries assigned to them by later histories may be questioned. Possibly we are to regard the historical lists which name these kings as a rearrangement of materials in the literature two or three thousand years later, in which those lists are first found by us. Some indications suggest that the dynastic Egyptians had not long been in the land before Dynasty IV.; possibly only for a century or two. If so, we might find traces of the rise of their art in some other country; and southern Arabia seems more likely than any other land to have been the source of the conquering race. The Mesopotamian affinities seem rather to be with the aboriginal race of Egypt. Here, then, we must pause, and hope that some happy discovery may enable us to understand in future the source and history of an art which is one of the most perfect and vital of any of the various styles to which different countries have given birth, and which to some extent underlies all the products of later times.



The Acme Wood Flooring Company, Limited.

SIR,—An impression having got abroad that this company is connected with M. C. Duffy & Son, Limited, whose liquidation arrangements have appeared lately in the public press, we shall be greatly obliged by your mentioning in your next issue that there is no connection whatever between the two firms.—

Yours faithfully, H. W. JEFFERY, Secretary.

114 Vauxhall Walk, Lambeth, London, S.E.:

May 30, 1893.

GENERAL.

A Single-Light stained-glass window, depicting *The Resurrection*, has just been placed in Trillick Church, co. Tyrone, to the memory of the late rector. The central figure of our Saviour is treated in a very spirited manner, the light draperies affording a strong contrast to the deep colouring of the sleeping Roman soldiers in the foreground. The canopy and base are unusually rich. The work has been executed for the present rector, the Rev. J. Forde Leathley, by Messrs. Jones & Willis, of Birmingham and London.

Mr. Robert Carey will read a paper on "Economical Hydraulic Lifts," at the meeting of the Society of Engineers to be held at the Westminster Town Hall on Monday, the 5th inst.

The Northampton Town Council have obtained a provisional order for acquiring further land in extension of their sewage farm at Ecton, rendered necessary by the rapid increase in the population of the town. It is to be laid out for irrigation and intermittent filtration, the Corporation preferring this method of dealing with their sewage to the adoption of any chemical treatment. Mr. E. Bailey Denton is the engineer.

A Marble Pulpit, designed by Mr. G. C. Ashlin, R.H.A., has just been completed for Newry Cathedral. The style chosen is the fourteenth-century English Gothic, all the details of moulding and carving being strictly characteristic of that period. The centre panel contains a fine group, the subject being "The Sermon on the Mount." Eight smaller panels contain carved emblems and foliage.

A Design by Professor Gabriel Seidl has been adopted for the proposed Künstlerhaus in Munich. The first stone will be laid on July 8.

Thompson's Cross, at the entrance to Stalybridge, has been restored or renewed according to designs by Messrs. Eaton & Sons.

M. Corroyer, architect, was on Saturday elected one of the vice-presidents of the Union Centrale des Arts Décoratifs.

A Statue of John Knox, modelled by Mr. John Hutchison, R.A., is likely to be erected in Edinburgh, where there is no figure or monument of the reformer.

M. Louis de Forcaud, the successor to M. Taine as professor of aesthetics and history at the Ecole des Beaux-Arts, is known in Paris as a writer of criticism on works of art.

A Local Government Board inquiry has been held at Widnes in relation to an application to borrow 26,451*l.* for improvements. It is proposed to expend 15,516*l.* for work in private streets. It is also intended to expend 10,415*l.* on the erection of a technical school and free library.

The Architect.

THE WEEK.

THERE are not many men in England whose names appear on the lists of selected subjects on whom birthday honours are to be bestowed which would give rise to the general satisfaction with which the name of Mr. JOHN TENNIEL was seen on Saturday to appear on the list. For about half a century the artist has served his countrymen by expressing their sentiments in an artistic form. The history of England and its relations with the rest of the world could be inferred from the figures which Sir JOHN TENNIEL furnished from week to week, if no other record existed. His interpretations no doubt have varied in popularity, for many a time they corresponded with the thoughts of a few manly men rather than with those of the multitude, and the artist was never afraid to rebuke when his duty called on him. His plates are all the better on that account, for they reveal the designer's character. Sir JOHN was always true to himself, and there must be very little which he can wish to erase. He has helped to raise the quality of illustrative art. Many critics have regretted the loss of a great decorative painter in what some may call the caricaturist, and others the cartoonist, for it should not be forgotten that Sir JOHN TENNIEL'S *St. Cecilia* is, in many respects, the most successful of the Westminster frescoes. On the other hand, who can calculate the educational influence of such noble draughtsmanship as he has placed before us every Wednesday? Anyone who compared Sir JOHN TENNIEL'S *Haunted Man* with LEECH'S, when DICKENS'S Christmas story appeared, could hardly fail to perceive that a more exact style of drawing as well as a deeper symbolism was about to be employed, and the promise offered by such early work has been upheld. Sir JOHN TENNIEL'S draughtsmanship has improved from week to week, and his endeavours have been rewarded, for, as yet, signs of decay are happily not evident. He has rendered more valuable services to his country and his age than a hundred Royal Academicians, and yet orators have gone about discoursing on the progress of English art without mentioning Sir JOHN TENNIEL'S name. Was there ever a drawing by him to be seen at Burlington House? The history of his works is by itself enough to show that the Academy is becoming more and more obsolete, for the best efforts of English art take a direction which it can neither guide nor approve, but dare not obstruct.

ALTHOUGH Manchester as a city has aided the Ship Canal with characteristic courage, there is more or less hesitation about undertaking to erect buildings in connection with that great work. This desire to wait until the class of buildings required is demonstrated by experience was revealed at the auction of building sites on the De Trafford Estate, which was held by Messrs. CHINNOCK, GALSORTHY & CHINNOCK in Manchester on Tuesday. Some of the sites were close to the canal. On the first day seventy lots were set up for sale, but only five were sold; the amount received for them was 835 $\frac{1}{2}$ l. As the total area was 13,520 square yards, the price given was only about 1s. 3d. a yard. As the prices offered were insufficient, twenty-three lots were withdrawn. There was no bidding for forty-two lots. At a later time it is probable that a good many of the lots would bring high prices. On Wednesday nine lots were disposed of at a total of 4,165 $\frac{1}{2}$ l., and some building plots were sold, the rest of the lots being withdrawn.

THE Panthéon can hardly be comprised among the modern buildings of Paris, yet only a week has elapsed since the nephew of SOUFFLOT the architect died in the Rue Pierre Chardon in that city. With him passes away a link which united severely classic architecture to the free adaptations of our time. The Commandant SOUFFLOT would in six months have reached his hundredth year, and on that account also was of interest to his countrymen. But his career was in other ways remarkable. As far back

as 1812 he distinguished himself at the battle of La Guarda in Spain, for he was mentioned in the order as having carried off a flag from the enemy. In the disastrous invasion of Russia he was a participator, and until his last days he was unable to forget the horrors he witnessed. After the downfall of the First Empire he remained true to the Napoleonic ideas and withdrew from the army. Subsequently he rendered service to others besides his countrymen by his organisation of the Messageries Maritimes.

THE Italians are beginning to ignore the boundaries of the old principalities as well as the old jealousies, and to recognise as countrymen those celebrities who were born in Naples, Rome, Perugia, Florence, Milan or elsewhere, no matter how much they may have differed in the dialects they used or in the opinions they held. Hence it is that a national subscription has been opened to erect a monument of GIOTTO at Vecchio di Mugello. All Italy should gladly contribute to the fund. Indeed other countries might well share the expense. Who now can think of the artist who superseded CIMABUE as having any local characteristics? His humanity was as wide as it was genial. His great contemporary gave up to party what was meant for mankind, for the poet became subservient to the politician, and the sweep of DANTE'S imagination was often narrowed to suit the rancorous views of the defeated vestryman. GIOTTO'S affection for living beings was too comprehensive to allow him to test the worth of men and women by the degree of their subserviency to his political or parochial notions. As a painter of scriptural scenes and monastic legends he could not avoid introducing figures that were expected to be made unattractive, but even from them we can perceive that GIOTTO was restrained in his hatred. As became an artist, his pencil expressed a sort of universal language, and his works should always have universal appreciation. It is to be hoped the money for his monument will be quickly collected; but if the project should fail, we cannot imagine GIOTTO'S spirit (assuming the intelligence to reach Elysium) would be in the least moved to despise Italy for ingratitude, or even capable of doing so.

ONE of the oldest churches in Brussels, St. Catherine's which stood near the central market, has been removed. It was not a remarkable example of architecture, but as the examples of ancient work are decreasing in the city, the demolition has given rise to some regret among a few archæologists. In Brussels apparently there is a desire to impart the most modern air to the streets, and the value of old buildings in providing effects of contrast is not appreciated. This is one of the differences between the capital and Antwerp. The demolition of St. Catherine's has given occasion to the revival of a subject that has interest for the students of the battles over creeds. ARNAULD, who was one of the followers of Bishop JANSENIUS, was compelled to seek an asylum in Brussels, and it was there he died. The place of his burial was prudently concealed. From time to time researches are undertaken to discover his tomb. M. ALPHONSE WAUTERS has toiled with that view in the vaults of St. Catherine's when they were exposed, but he has been no more successful than his enthusiastic predecessors.

WE have received a copy of the "Tourist Guide to the Continent," published for the Great Eastern Railway Company. It has been compiled for the use of travellers to the Continent *via* Harwich. Holland, Belgium, North and South Germany are dealt with, and attention has been given to providing information in regard of districts of interest unknown to the general run of tourists. The book contains nearly 170 pages, well and copiously illustrated, and a large map. There is much information, too, that is often wished for, but not obtained by those who consult standard guide-books. It is astonishing to find the cost is only sixpence, as it might be split up into some half-dozen guide-books that are offered to the public at a shilling each. The pages devoted to the benefit of cyclists will be appreciated. The guide is specially issued by the company this season in connection with the new route to the Continent *via* the Hook of Holland.

NOTES, PRINCIPALLY ON ENGLISH "GEOMETRICAL DECORATED" WINDOWS.

BY A CORRESPONDENT.

WHATEVER diverse views men may have on the respective merits of the principal recognised styles of architecture, the greatest partisan of, for example, one of the most opposite styles to "English Geometrical Decorated," viz. the Greek Doric, will readily admit that the peculiar beauty of the window tracery of the former period cannot be equalled. Of course there are those who may in this particular feature prefer the *abandon* of the Flowing Decorated, or the stiffness of the Perpendicular styles. But the writer has elected to make comparison with the fenestration in a style where tracery did not exist, and so nothing invidious is intended in the way of vaunting the claims of Gothic above Classic architecture. The number of secular and domestic buildings erected and still existing during the period when the Geometrical Decorated style flourished in this country is certainly very limited as compared with the ecclesiastical work of that date. The reason for this is not difficult to seek and is fairly obvious. The remarks the writer proposes to make are not intended to apply exclusively to church windows, because geometrical tracery of course existed in the secular work of the period when Gothic was the "vernacular" and men built everything in that national style. Wherever square or segmental arched window heads were more handy—in churches, for example, where economy in saving height was of importance, or in other instances—the pointed arch was discarded without any hesitation. For the very essence of the true Gothic spirit was its adaptability to circumstances. The same spirit is to some extent happily exhibiting itself both in ecclesiastical and other architecture at the present day. Architects wisely refuse to be bound by the iron fetters of mere formalism, and this is more particularly observable in domestic buildings. But there is not the faintest idea of advocating in this article any wild eclecticism.

The writer is well aware that window tracery has been ably treated by the late EDMUND SHARPE, E. A. FREEMAN, and others, but the subject presents so large and varied a field that it is perfectly possible to look at it from some other standpoint, and to throw, it is hoped, a little fresh light on the study. It would be foreign to the present purpose to enlarge on the origin of tracery, for that would be a recapitulation of a tale already well told by great authorities now gone to their rest. One of the initial and most important points in designing the windows of a church is to settle the proper width of the lights, so that there may be due harmony and proportion with the building generally, and that they may be neither too narrow nor too wide. When this has been decided, the suitable thickness of the mullions has to be determined. It is surprising what a difference an inch or even half an inch makes, specially when there are a large number of lights, and, of course, proportionately, one-eighth or quarter of an inch makes a great deal of difference in the thickness of the mullions. It is almost needless to say what an important point the depth of mullions from face to glass line is, specially externally. In some of the later windows the "square" from glass line to commencement of the mouldings of mullions is too little, and this results in a poor shallow appearance. In a particular school of architects at the present day the multiplication of lights is fashionable, and so this matter of their width becomes the more important. For it will be apparent that when a three-light or five-light at most was used, the question scarcely arose. Now it is very curious to examine this in the case of Mediæval windows, and to note the immense variation. For it by no means follows that a small village church should necessarily have lights of less width than one of larger size, though, as matter of course, the expected proportion is more usually found. Quite early in his architectural career the attention of the writer was drawn by a friend to the great width (4 feet) of the lights to the magnificent four-light windows of the Chapter-house, Westminster Abbey. Yet these look in good proportion, and it is difficult to realise their real width. It is believed that in English examples this dimension has not been exceeded. In Mediæval Early French one-light windows, the lights are of course often of con-

siderable width, much more so than in this country during the thirteenth century. Of modern architects, perhaps, Mr. JAMES BROOKS has used the widest lights to single windows designed of an early character. In the great traceried windows to the east end of the choir of Lincoln, Carlisle and Ripon cathedrals, Tintern and Guisborough Abbey churches, the widest light is that at Ripon (2 feet $10\frac{1}{2}$ inches). Treating the Westminster Abbey chapter-house windows as exceptional examples, there can be no question that from an architectural standpoint, where the walls are of good and sufficient height and (what is almost as important) of good thickness, the narrow light to a lofty window is the most effective, affording also greater space for internal coloured decoration where that is required. To the glass painter it is true that little scope is thus given for big subjects. But the latter are naturally much more difficult to successfully treat, so this is not so much to be regretted in the majority of cases. Moreover, one cannot have everything in this life, and the true artist can do effective work with single figures on pedestals, with canopies and tabernacle work. Objection is sometimes made to the latter as improper treatment for glass, as representing "sham" architectural details. When one sees the attempts these purists make to give us something better, the result is generally by no means encouraging. To return to the immediate subject. In order to produce their full effectiveness internally, it is essential that narrow lights, especially if single, should have a widely splayed deep internal reveal, and that is why substantial thick walls are so helpful. A church can be just as well, if not better, lighted by comparatively narrow lights instead of by wider ones, and as an architectural composition the result will decidedly be more satisfactory. For the greater number of mullions and the more substantial appearance in the tracery tend to that consummation, while the effect will also be to give greater scale to the building. That is one of the secrets of the architect's success, *scale*, provided he works for it by fair means, without resort to unworthy artifices, such as are to be witnessed in late work in Italy, for example.

There is one important point in the design of a good window that is very frequently quite lost sight of, *i.e.* the treatment of the sills. Take, for instance, the magnificent eight-light east window to the choir of Lincoln Minster, generally considered the finest example in England of Early Geometrical work, any detail of which it seems almost presumptuous to criticise. Everything in it is dignified and according to the best principles, save, perhaps, the sill, which would have been improved if it had been in three or four divisions instead of only two. In the four-light windows to the Chapter-house of Wells Cathedral, far more importance is given to their sills, which are in five divisions, though of course these are on a much smaller scale than the Lincoln example. At Northborough Church, Northants, which is still less in size, the window on the south side of the transept has four divisions to the sill, which is of course very unusual. Even where there is only a single sill, it can be made more effective if of good depth. Again, in cases where for external effect an important looking window is desirable, so as to break up a blank wall-space or for other reasons, the deep window sill or sills is an excellent device, as this obviates the necessity of unduly increasing the amount of actual glass space.

Another important consideration for securing an effective window is to have at least two orders of jamb mouldings. Many elaborate traceried windows lose much for want of this, and have a flat, poverty-stricken appearance. Of course in smaller windows, such as in organ chambers and vestries, the double order is not so necessary. In the opinion of the writer it is better to have a simple traceried window, designed on this principle, rather than a much more elaborate one where it is disregarded. The external label is also a most desirable finish wherever there is room for it, though it can be dispensed with in less important and small windows, as in the instances just mentioned. There is an unsatisfactory mode, by the way, of finishing the label (at the springing line of window arches) when the short "return" of the label mouldings is omitted, as this results in a very crude appearance. Of course a carved boss or a head is a good finish, and prevents the abrupt termination complained of.

The next point for consideration is that very important one of the mullion, for on this depends to some extent the effectiveness of the tracery. It may be stated as a general axiom that it is far better to err, if err one must, on the side of redundant thickness rather than in the other extreme. For one has to consider not only that stone, or possibly granite, in some counties, is the material employed (and so some degree of robustness in treatment may be expected), but that good substantial mullions and tracery aid the construction, both practically and spiritually, so to speak. This, in fact, helps towards that homogeneity in a building so essential to its success as an architectural composition. How many otherwise good windows, ancient and modern, have been seriously injured in their effectiveness by the tenuity of the mullions, &c., which, of course, is more often found in the later than in the earlier examples. No architect should lightly decide on this point without careful study. A great element of dignity in a window is the employment of shafts attached to the mullions as well as jambs. This adds much to the grandeur of the east windows of Lincoln Cathedral, Guisborough Abbey Church, and other important examples.

It was well written by RAPHAEL and ARTHUR BRANDON in that famous standard text-book, "The Analysis of Gothic Architecture," page 26, published nearly fifty years since, "the distinct planes of tracery and mullions thus produced * constitute one of the most beautiful features in Gothic windows." Certainly nothing equivalent to this is found in other styles, and the Mediæval architect "bears away the palm" in this respect. Yet the above axiom is too often disregarded at the present day, when immense windows with elaborate showy tracery are found possessing only one order of mouldings; whereas something of a simpler description, with more subordination of mouldings, would have been far better. In the five-light Flowing Decorated window to the north transept of Nantwich Church, Cheshire, the central mullions are rather thicker than the others, but have the same mouldings. This treatment is not, however, continued into the tracery. The plan is certainly rather unusual, and would, perhaps, be considered by some as daring. But it seems to the writer that it was in details of this kind that the Mediævalists showed the proper spirit, refusing to be bound as if by cast-iron trammels. In this instance the effect is good and emphasises the central light, whereas the adoption of another order to these two central mullions might have raised needless difficulties in the tracery, and involved a good deal more work. This was avoided by the simple expedient just mentioned. Further on it will be shown how at times, when there is sufficient reason for it, deviation from hard-and-fast rules is commendable. In another five-light example—the east window of Houghton-le-Spring Church, Durham—the two central mullions are thicker and a little deeper, without any defined extra order (this extra thickness, &c., being carried up into the leading lines of the tracery), while the central light is wider.

(To be continued.)

THE GRIEVANCES OF BUILDING WORKMEN. II.†

THE trades unionists having been so far successful as to obtain the insertion of clauses in municipal contracts by which sub-contracting is prohibited, they desire to see similar restrictions operating in other matters. One matter which is obnoxious is the employment of machinery in such a way as to become dangerous to workmen. Let us hear what the secretary of the London Building Trades Committee has to say on the subject:—

We think there should be some inspection of builders' premises; we think that the builders' works should be inspected just as much as a textile factory.

Do you mean to say when a building is going on from day to day the Government should provide an inspector to see that the whole of the scaffolding and the works going on there are of a safe character?—No, I do not refer to the building, I refer to the workshops where the work is manufactured. A great deal of machinery—a vast amount of

machinery—is used, and very often unskilled men are employed at those machines and a lot of lads round about, and accidents are very frequent, and there is not sufficient care taken in regard to fencing off this machinery. In the wood-cutting and joinery line there are boys and men engaged on the very dangerous machinery now in use.

Are there any young persons employed?—Oh, yes, persons of all ages.

Steam-power?—Steam-power.

They are inspected, are they not?—Well, it has never been my lot, and I cannot meet with a single individual who has ever known an inspector to come through a builder's workshop. Accidents are very frequent; in fact, two thirds of the machine men now employed in London have lost the majority of their fingers off their hands through the danger of these machines.

That is a very strong statement you are making?—It is a strong statement, but it is the fact.

Two thirds of the machine men?—Yes.

What do you mean by machine men?—The men who work these wood-cutting machines—men and lads; there is generally a man and a boy. Very often in some firms the man is an unskilled man, having no acquaintance with the machine. Not being used to the manipulation of the machines, many a lad is maimed for life; in fact, to show how indifferent some of the workmen become about it, I may mention that I used to know an old foreman in a large mill who thought five fingers were unnecessary on a man's hand, and that if a man lost them while he was young, so much the better—he had got so many of them out of the way. Of course that is simply the cruel way in which it was looked upon, but I do maintain that the builders' shops, the premises where the work is being carried out, should be under close inspection, just the same as factories. Everything should be kept in proper condition and machinery fenced, and every care taken against accidents.

It would be difficult to discover in socialist novels anything more cynical about our modern systems of production than the foreman's remark, but it must not be taken as an expression of the inevitable fate of the attendants on wood-working machinery. Men of that class often become indifferent to their risks, and when they are careless no fencing will protect them. As respects the assertion about the exemption of builders' workshops from official inspection it will surprise many people. The neglect is not caused by any diplomacy on the part of the builders. The secretary of the National Association of Master Builders was asked whether all the workshops were subject to the inspectors of factories, and of course he replied in the affirmative. In his district the officer took care to see that everything was safe, and especially that machinery was protected. If factory inspection is to be advantageous it must be general; and if hitherto the officers have supposed that building workmen are to be found only on buildings in progress they will do well to take a hint from the evidence before the Labour Commission.

Sanitary inspectors in some places are also remiss in their visits to builders' workshops. The following statement by Mr. MOORE, the non-unionist workman, has, we fear, little exaggeration about it:—

In the large and best workshops in London, Cubitt's and other firms of that class, you find things on a very good footing. You find the sanitary condition of the place, and the general rules and regulations very reasonable and fair; but where you find one firm like that you will find a dozen in which there is great indifference and great neglect upon the part of the employer, in whose hands, of course, the matter lies as to the sanitary condition of their workshops. You will find workmen working over stables, with a lot of horses underneath them, and you will find that the sanitary offices and places of convenience are in a shockingly bad condition. I do not think I need go further into the details of that matter, it ought to suffice me to say that they are in a shockingly bad condition, affecting the health of the workmen. Of course, it matters little to the employer; he goes to the shop probably once a day twice a week; at some places not that. His foreman goes down to the office and transacts his business with him, so it does not affect the employer at all, but the workmen are there all day, and they suffer in health.

The dangerous condition of workshops, if general, would be enough to create a grievance. It is brought forward, however, to support a more important contention, viz. that builders are indifferent to the safety of their workmen. This is seen from the assertion of the secretary of the London Building Trades Committee:—"In the building trade I can assure you that the system of allowing the contractor to insure out of his liability simply by paying a small insurance fee does not cause him to take care of the lives of his workmen." That is to say, the builder will not trouble himself about the defects of his plant, by which men's lives are risked, as it is much easier and more economical to cast the responsibility on an insurance society. But the workmen are not satisfied by the arrangement, although Mr. MUNDELA and the economists approve of "contracting with some wealthy insurance com-

* *I.e.* "By the introduction of distinct orders of mullions and by recessing certain portions of the tracery from the face of the primary mullions and their corresponding tracery-bars."—R. and A. Brandon.

† *Minutes of Evidence of the Royal Commission on Labour.* Her Majesty's Stationery Office.

pany that takes the average of accidents all through the country." Is it inevitable that building must comprise the killing and maiming of craftsmen and labourers? The men do not think so, and by their spokesman, Mr. Dew, they say:—"We do not really want compensation for accidents. We do not want accidents; we want a Bill that will practically prevent accidents." The insurance has unhappily become so common, it may appear to be a necessity; but its origin is most modern in the trade, and, curiously enough, corresponds with the time when the new class of contractors arose. It is not so long since builders were acquainted with all their workmen, and that is not strange, for masters and men used to be associated for years. Nowadays, the periods of engagements are brief; there is a constant change, and employers and employed have only such relations as can exist among the elements of "averages." The contests, therefore, over accidents have become more bitter from becoming as it were impersonal. The men have to deal with opponents who are unknown to them, and who appear not as individuals but as a corporate body, without any feeling except the very strongest repugnance against paying damages or doing anything that will affect the infallibility of the average calculations. The workmen observe that the insurance companies do not trouble themselves about the condition of plant and machinery, and they are hardly to be blamed if they conclude that whenever accidents arise the chances are that the companies will escape expenditure on compensation. Mr. MUNDELLA is ready to overwhelm a witness by citing cases of explosions in mines and wrecks at sea as evidence that accidents are inevitable, and that the doctrine of averages must therefore be held in respect. The obtuseness of mind among builders' workmen is of such density that it cannot be overcome by official logic any more than by tracts. The men imagine that in mining and on the ocean there are dread natural forces at work with which we cannot always grapple, whereas in building all dangers can be foreseen and provided for. What is it to them if the averages are found to be exact; if they have to suffer during life through the neglect of some slight provision the accuracy of statistics brings little consolation. It is hard enough to have, out of loyalty, to sacrifice individuality at the bidding of a trades union, without being expected to be glad at becoming a cipher for the use of assurance specialists.

There is another view to be taken of accidents which does not present workmen in a favourable light. There is no doubt men suffer not from the carelessness of masters alone, but also from the maliciousness of their fellow-workmen. The records of the courts reveal too many cases which prove that trade is jealous of trade, and that without scruple acts will be done with the intention of inflicting injury which under other conditions would bring the doers within the purview of criminal law. It is astonishing how liable the workmen engaged by specialists and sub-contractors are to come in contact with falling bodies, and with what ease planking bends under their weight. To those who are not able to see below the surface the declaration of one of the representatives of the carpenters, "we maintain that as the workman has no control over his fellow-workman, however incompetent he may be, the employer should be held responsible for the accidents which may occur to another fellow-workman," will appear to express nothing remarkable, but it really means that there is a mutual apprehension of wilful injuries, and that as it is impossible to reform the men, the wisest course is to make the employer pay for whatever occurs on his premises. It was pointed out by Sir FREDERICK POLLOCK that by common law a man who has suffered injury from an employé or servant can only bring an action against the master of the servant, but what workmen seek is to be put in a better position than any other members of the public, and to have the liberty to bring actions for compensation against whichever party connected with the works is best able to pay.

Whatever the workmen may do, it must be said that little advantage is to be derived by them from accidents. When actions at law succeed the plaintiffs have to settle with the solicitors, and, as one of the witnesses, said, "there is more money goes in costs than the men get." There is no reason apparent that accidents should have assumed so much importance in connection with building. In days when there was little aid to be derived from

machinery, the most difficult operations were gone through without injury to life or limb. In our time the risks are diminished. By the exercise of efficient management on the part of masters, and by a little less selfishness and indifference among the men accidents should be avoidable. For as a carpenter and joiner acknowledged, "In the case of some of the very best building firms in London you rarely hear of accidents, or you hear of very few accidents, indeed, where they are very careful."

The last grievance we may notice relates to the number of hours during which building workmen should be employed. To many it will appear as the most important of all. For instance, one witness when asked how far he wished Government to meddle with business, replied:—"I cannot agree with their regulating wages; I think if the hours are regulated wages will regulate themselves." His answer makes it evident that when an eight-hours day is demanded it is not because the men are exhausted if they work longer, nor that they are anxious to avail themselves of the facilities for technical education, but simply because they hope that a high rate of wages must accompany a brief term of employment. Another witness expressed the same notion when he said: "I generally find in most of the trades I am conversant with, that the longer hours they work the less wages they receive," and he added his conviction that "the shorter the hours men work the more they will receive."

The desire of every architect will be that builders and workmen can carry out contracts with satisfaction to themselves. But it must not be forgotten that clients or building owners have also interests which are in danger of being overlooked. It seems to be a truism that a diminution of the hours of labour must mean a corresponding diminution in the quantity of work that is produced. As the time allowed for the erection of buildings is generally a fixed quantity, it must follow that they will have to be delayed or a larger number of men will be required. In either case the cost of building will be increased. In the present condition of business it is not likely that the public will readily agree to pay more, and the number of new buildings erected will consequently be diminished for a longer or shorter period or until people have grown accustomed to the rise in prices. There is an alternative. Builders are likely to cheapen production by using a still greater quantity of stuff that can be turned out by machines and by giving larger orders to foreign manufacturers. Can architects be expected to condemn that arrangement or any other that will conduce to economy? As one of the workmen who gave evidence before the Commission said:—"Practically, the architects are employers; their whole interests are with their clients, those who pay for the work, and with the employers." They are not without interest in the men also, but when men are prepared to sacrifice builders, building owners and architects, if that would bring them a trivial advantage, can architects be expected to meekly offer themselves and their clients as victims on the altar of trades unionism?

CHELSEA INFIRMARY.

THE following letter has been addressed to the *West London Press* by Mr. H. Young:—

In the recent competition of architects' designs for the proposed additions to Infirmary, and which when built will occupy the corner site of Sydney and Cale Streets, I beg to say that I did not charge Mr. Blore with "jobbery." I solely advocated, on the grounds of fair play, that as seven architects had been invited to compete, and who were nominated by the Guardians, that the proper course to pursue to prevent misunderstanding or friction would be to appoint an independent assessor of standing such as Mr. H. A. Hunt or Mr. J. M. Brydon, both professional men who have acted in a similar capacity on behalf of the parish for respectively our new Town Hall and new Library at Kensal Town, to adjudicate and report on the best set of plans, and if the same could be carried out at the limited cost. The conditions as to cost are set forth at 5,000*l.*, plus an allowance of 10 per cent. as an extreme amount. Now, although I believe Mr. Blore to be one of the most upright and conscientious men in this parish, and one who undoubtedly gives an immense amount of time and invaluable assistance to the local institutions, yet I cannot help sympathising with him for inadvertently

falling into what I consider a grievous error through over zeal. On my going to the General Purposes Committee, held May 17, I found Mr. Blore enthusiastic on a certain elevation drawing marked 3, to which he drew my attention as also that of other members, and he handed me a written report which he said Mr. Brass and himself had drawn out together. This report dealt exclusively with the merits of designs marked No. 3 and No. 2, and which consisted in "The facilities afforded for Ventilating and Heating." All other designs were ignored *in toto*. This appeared to me so childish and ridiculous an argument that I pressed for an assessor, to which Mr. Blore said he would not object. I also sent him a telegram from the country urging this request. I must mention here that one architect declined to submit a design (wise man) for reasons I know not, but this vacancy was filled up by the authors of No. 3, who sent in the design No. 2 without the knowledge of the Board members. Imagine, then, at the Board meeting of May 24, the Assessor ignored, and Mr. Brass moving the adoption of No. 3 for first premium and No. 2 for second premium, and Mr. Blore having much pleasure in supporting the recommendation! The chain of unfortunate circumstances, I consider, consisted of—

1. The architects being the nominees of Mr. Blore.
2. Both designs being by his nominees.
3. By privately submitting a report and canvassing, Mr. Blore apparently assessed for his friends.
4. That Mr. Brass, having moved for a committee to materially alter the structural design by cutting out the towers and turrets at corners of building, tends to show that the work cannot be done for 5,000*l*.
5. That at this committee-meeting, held May 30, Mr. Brass (after his motion was defeated) said the towers would not be permitted by either the London County Council or the Vestry, only shows that the selection has been hastily made, and, if true, should disqualify the plans he so much advocated.
6. That the architects, in reply on heating, said they intended to take the heating power from an existing saddle-boiler in use at the Infirmary for other purposes, and, if inadequate, "a new and larger boiler must be put in at the cost of the Guardians."

So that the heating theory referred to by Mr. Brass becomes a farce, and further comment is unnecessary.

PALESTINE EXPLORATION.

THE following account of Mr. F. J. Bliss's lecture as to the excavations which he has carried out during the last two years at the mound of Tel-el-Hesi, the site of the ancient town of Lachish, appears in the *Manchester Guardian* from a correspondent. A simple diagram on a blackboard explained the position of the stream, which, itself 220 feet above the level of the sea, has its course 60 feet below the bluff upon which the earliest of ten towns successively raised was built about 3,000 years B.C. The mound rises to a height of 60 feet above the bluff, and the theory of its growth held by Professor Flinders Petrie has been confirmed by the investigations of Mr. Bliss. The lecturer showed that the mud bricks of which the towns had been built readily formed a foundation for rebuilding, the process of reconstruction having been carried out in each case at an increased altitude of something like four feet, so that at the building of the tenth town, which was ruined in the fifth century B.C., the present height of the mound would be nearly reached. Mr. Bliss explained that before he began his work there was no sign of any ruin on the mound, which was covered with a crop of beans. His first step was to set thirty men digging, assigning to each a space 10 feet square, with two or three dozen helpers to carry away the refuse earth. The work had not gone on for half an hour before Mr. Bliss plainly saw that he was digging in no ordinary soil, numerous pots, lamps, beads, &c., coming immediately to light. The domestic habits of the people resident in the neighbourhood to-day help to throw considerable light on the discoveries, for they were accustomed to use the same utensils as their progenitors in past ages. The results met with in excavating the second town were better, because the ground was freer from moisture. A burnt barley store was met with at a depth of 8 feet. The explorers found much difficulty in distinguishing walls from *débris*, on account of the nature of the building materials, so much so that Mr. Bliss spent his first month at the Tel in crumbling brick to ascertain its composition. When the third level was reached certain parallel lines of stones with intermediary wallings revealed the site of some large public structure, the stones having formed the basis of pillars built of wood or brick. Thus the work proceeded through six levels, when a bed of ashes was met with 4 or 5 feet thick and 100 feet square. Many days were spent in its removal by 80 to 100 men, until at last Mr. Bliss almost despaired. But at length occurred the

discovery which gave the romantic side to Tel-el-Hesi, in the finding of the other end of the correspondence which had been brought to light in Egypt, including letters from consuls and governors of Syrian towns to the kings of Egypt. The find was made immediately below the bed of ashes just referred to. The tablets on which the letters were written belong to B.C. 1400, and they prove conclusively the use of cuneiform writing at that date between one town of Palestine and another.

At the conclusion of the lecture Professor Flinders Petrie congratulated the society on the co-operation of so able an excavator as Mr. Bliss, who combined in a manner almost unique familiarity with Syria and with England alike, not to mention his scientific acquirements. His method was not to be surpassed for accuracy, precision, and thoroughness of record. In certain other cases an unscientific method of procedure had occasioned fearful losses. But in this instance there had been no loss, while Mr. Bliss had obtained for us through his discovery of arms, pottery, &c., knowledge of an ancient civilisation which heretofore had been to us but a name.

SYDNEY ARCHITECTURAL ASSOCIATION.

THE opening meeting of the 1893 session of the Sydney Architectural Association has been held. Mr. George J. Oakeshott, A.R.I.B.A., president, occupied the chair, and there was a good attendance.

The committee's report recorded the continued success of the Association, as the membership, notwithstanding the depression, stood at 113. A few resignations had taken place, but they had been more than compensated for by the new members who had joined. The meetings during the past session had been held at the Royal Society's rooms, a change from the former meeting-place that was much appreciated. On April 8 last the president delivered his opening address on "The Future of Architects and Art," and other gentlemen had followed with valuable papers, which were much appreciated. The committee regretted that through unavoidable causes the classes were not carried through to as successful an issue as was anticipated, but it was hoped that during the ensuing session members would unite in the determination to make them a success. On May 2 the subscription for hon. members was altered from 2*l*. 2*s*. to 1*l*. 1*s*. per annum. The sessional visits to buildings had been well attended, and it was proposed to make arrangements for a continuation of visits throughout the session. Gratification was expressed at the success of the Arts and Crafts Exhibition, which was opened on October 26 last. The report was adopted.

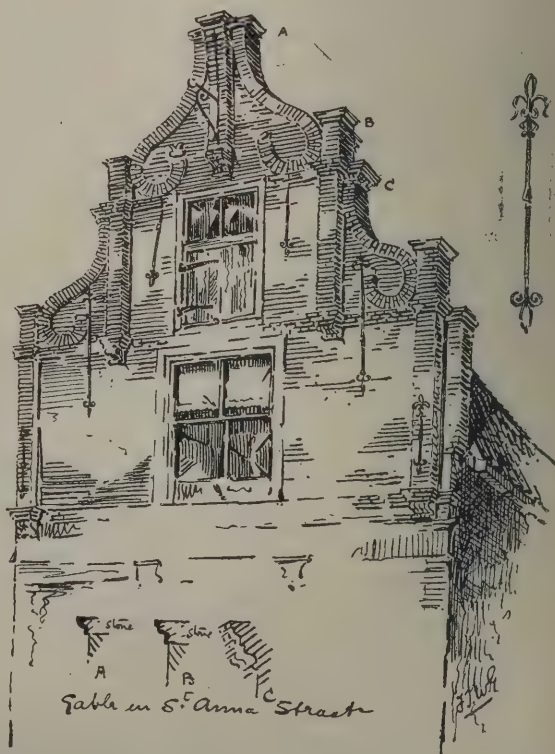
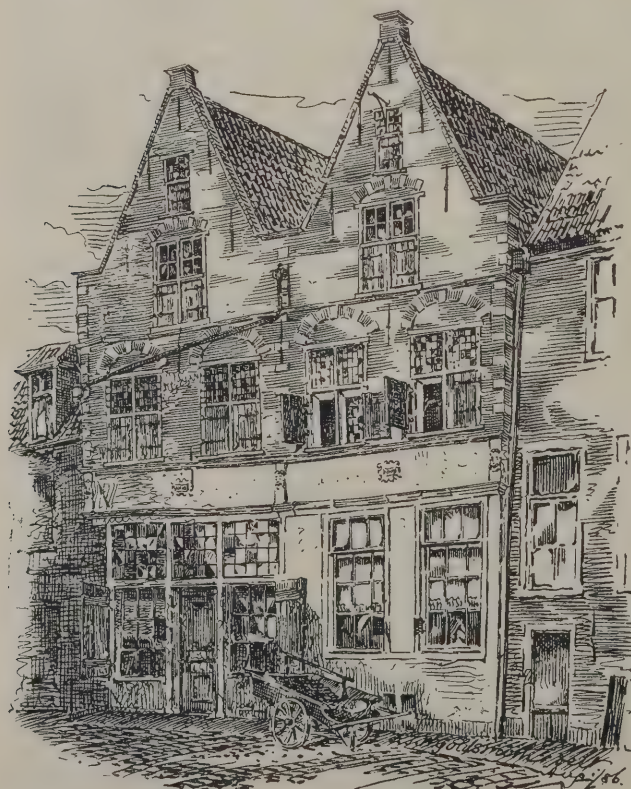
The President, in his annual address, returned thanks for the honour that had been conferred on him in electing him to the position, and claimed that he had one qualification for the high position, that there was no one who had the interests and welfare of the Association more at heart than himself. They had much reason for congratulation as well as regret; but their weakest point was undoubtedly the collapse of the classes, which from the first had been poorly attended. He attributed that failure to the lamentable apathy and indifference of their young fellows, and an apparent inability for any kind of serious study and application, increased by an inordinate love of pleasure and sport. They had carried on in the past three classes—the elementary, or, as they intended to christen it, the draughtsmanship and design class, the class of design, and the class of construction. He insisted on the importance and benefit of these classes to young architects and draughtsmen, and held that they should prove the backbone of the Association. He referred in terms of pleasure to the success that had attended the Arts and Crafts Exhibition, and said it had conferred a benefit on the community, and had been an educational advantage to the profession. A specially interesting feature was that of having craftsmen in different trades actually at work in the building. The monthly meetings had been an unqualified success, and it was held that members would largely benefit from a full use of the library, which contained a number of valuable volumes. Members would also benefit by visits to works in progress, but he regretted that some of the younger ones did not feel inclined to enter into the competitions on the ground that the prizes were too small. In conclusion, he urged members of the profession to unite and do their best to advance its interests.

Mr. H. Hunt, president of the Institute of Architects, said that one of the weakest features in their training was that there was a great disinclination on the part of students to work for other than monetary gain. The value of a good library could hardly be over-estimated; nothing could be more valuable in their profession than a good library. There was too much laziness amongst the younger members. Surely they should be ready to sacrifice their sports and pastimes for a visit to a good work in progress.

SKETCHES AT ALKMAAR, N. HOLLAND.

THESE sketches are some of a series made in a very pleasant sketching tour in N. Holland during July and August 1886; they are of old work at Alkmaar, an interesting city, though inferior in architectural interest to Haarlem, Leyden, or Hoorn; it contains, however, many bits of characteristic work. The Friesche Poort on the Great North Holland Canal is built more or less after the accepted model—square at the

base, with a lean-to on one side, a steep-pitched roof surmounted by the familiar many-storeyed turret with open top. Opposite the Weigh House, or what is called the Waagplein, is the old house shown in one of the sketches. The lower storey and frieze are cement; the date is 1607; the upper storeys brick. Throughout this part of the country the bricks used are seldom thicker than $1\frac{3}{4}$ inch. During my visit the tower of the almshouses in the Gedempte Nieuwestraat was being repaired; it rises without a break from the pavement to the cornice, and forms a very effective feature.



LAMBETH AND VAUXHALL BRIDGES.

LAMBETH, the *Standard* says, is in trouble about its Bridge, which it considers to be dangerous and in need of reconstruction, whereas the London County Council have passed it coldly by, and proposed to lavish 400,000*l.* on a new communication across the river at Vauxhall, the existing bridge at that spot to be superseded by one of five arches formed of steel, with granite-faced piers and abutments, the width between the parapets to be as much as 80 feet. When all this is done, as provided for by the London Improvements Bill now making its way through Parliament, such ample accommodation will be afforded for the cross-river traffic in that part of London, that a fear arises lest Lambeth should be left out of the reckoning altogether, and it is even rumoured that the County Council contemplate the entire extinction of Lambeth Bridge. So sweeping a measure is incredible, and the apprehension probably has no further warrant than a possible change in the site to a few yards higher up the stream when the bridge comes to be rebuilt, so as to provide for better approaches. In mediæval times Lambeth had its ferry, partly, it may be, on account of the archiepiscopal palace on the Surrey shore. On the Middlesex side we still have the "Horseferry" Road in memory of the past. To extinguish the bridge would be to ignore what must be a positive need for communication across the stream at this point. Lambeth Bridge stands midway between Westminster and Vauxhall, and its abolition would leave an unbridged gap of a mile in length between these two points. A local committee has been formed, headed by the Rev. Canon Pelham, Rector of Lambeth, and Sir Henry Doulton, who intend waiting upon the Bridges Committee of the County Council in reference to the entire subject. We have reason to say, that the committee will learn, although a regrettable delay is undeniable, that there is no intention to postpone indefinitely the claims of Lambeth Bridge. Supposing the necessary authority to be obtained from Parliament for superseding the present Vauxhall Bridge by a new structure, the next step will be to obtain power for constructing a new bridge at Lambeth. There ought to be no more time lost over this matter; but the process threatens to be a slow one. Prior to the pulling down of Vauxhall Bridge, a wooden structure, not less than fifty feet wide, is to be erected across the river from the extreme western end of the Albert Embankment to Millbank, to serve as a temporary bridge, the cost of which is estimated at 30,000*l.*, the estimate for the permanent bridge being 380,000*l.* We understand it is in contemplation by the Council that, after Vauxhall Bridge is finished, this temporary structure shall do duty for Lambeth Bridge, while the latter is being reconstructed. The commencement of the new Lambeth Bridge, therefore, seems to date from the completion of the new bridge at Vauxhall, and it is thus postponed to a somewhat remote period.

Lambeth Bridge was opened in 1862. It is a suspension Bridge with three spans, each 268 feet long. The four wire chains each contain seven twisted cables 3 inches in diameter. There are seven strands in each cable, and seven wires in each strand, making the total of the wires 1,372. The entire width of the bridge is rather less than 32 feet. The breadth of the roadway is 18½ feet, flanked by two footways of 5 feet each. The chains pass through four iron towers, supported on iron cylinders, originally sunk to about 18 feet below the bed of the river. The towers themselves are 33 feet high, and take the form of archways, spanning the bridge from side to side. In each of these arches the base is several feet wider than the summit, the effect being one of extreme ugliness, especially as the iron plates which form the outer skin are painted of a dull brick colour. With these horrid structures straddling across it, the bridge also has the defect of a strange up-and-down curve in the line of roadway from shore to shore. Railway engineers have been long looked upon as unequalled in the construction of ugly bridges, but they never surpassed this one, which stands as a perfect monstrosity, in view of the Houses of Parliament, the pavilions of St. Thomas's Hospital, and the graceful Westminster Bridge. Even the old proverb, which requires that we should speak well of a bridge which carries us safely over, can scarcely be pleaded at Lambeth. Reporting on its condition in 1880, Sir Joseph Bazalgette remarked that the twisting of the wires was a source of weakness. At that date a considerable quantity of rust had been recently removed from the cables, amounting in some parts to nine pounds' weight in a length of five feet, nearly half being pure iron, the structure suffering a certain loss of strength in consequence. The Metropolitan Board had then affixed a notice to the bridge, restricting the load allowed to pass over it to five tons. This Sir Joseph considered to be "a necessary precaution." In 1887 the anchorage of the cables in at least one of the abutments was found to be giving way. In accordance with a report from Sir B. Baker, certain repairs were at once executed, and it was considered that the structure was thus rendered secure for some years to come. But it is evident that the bridge has to be sedulously nursed. The five-ton load

of 1880 is no longer considered a safe weight to be borne. The Council have prescribed that no locomotive or steam-roller shall go on to the bridge or pass over it. The prohibition is extended to a load of any kind exceeding three-quarters of a ton on each wheel. The aggregate weight is in no case to exceed three tons, including the weight of the carriage. At this rate, an omnibus would scarcely be admissible, if full inside and out. How much lower the limit will be drawn is a matter for conjecture; but it has been satirically suggested that by-and-by the rule will become so rigid as to admit of only a man and a boy. The other day, when Captain Boyton had his demonstration on the Thames, the gates of Lambeth Bridge were closed to exclude the crowd, lest it should break down. That such a bridge should exist within the boundary of the metropolis is little less than marvellous.

It cannot be said that the County Council are ignorant of the state of things to which we have referred. Their own regulations as to the traffic show how thoroughly they appreciate the perilous state of the bridge. The committee which recommended the reconstruction of Vauxhall Bridge spoke of the traffic at that spot as having been much increased of late years, not only in consequence of the enlargement and alterations of the railway station in the neighbourhood, but as a result of "the weak condition of Lambeth Bridge." There are returns which show that the number of vehicles crossing Vauxhall Bridge experienced an increase of 50 per cent. between the summer of 1879 and a similar period in 1891. At the same time, it must be remembered that part of the Lambeth traffic was diverted into the Vauxhall current. Concerning the relative state of the two bridges, it may be said that Vauxhall Bridge is sound in its superstructure, though weak in its foundations; while exactly the opposite is the case at Lambeth. That Vauxhall Bridge must needs be rebuilt at an early date may be admitted. As far back as 1878, the foundations were discovered to be insecure, if, in fact, the bridge could be said to have properly any foundations at all. Mr. Law described it as "placed on the bed of the river," simply standing on a timber platform resting on a surface of clay. For the protection of the structure, Mr. Law said he saw no better mode than that which was proposed for Waterloo Bridge, namely, putting caissons round the piers. He considered that the time had arrived when this ought to be done. The bridge is considerably older than the one at Lambeth, having been completed in 1816. The piers are of stone, with a superstructure of cast-iron. Its original cost was 260,000*l.*, and the Metropolitan Board bought it for 75,000*l.* Last year a diver was employed by the County Council to examine the foundations, when it was discovered that the action of the tide was removing the protective works which had been laid down. It was evident that the bed of the river was continually deepening, owing to the great scour caused by the high velocity of the current, which sometimes exceeded seven miles an hour at the surface, and impeded the progress of steam vessels passing under the bridge.

ST. MARY'S SPIRE, OXFORD.

FOUR alternative designs for the repair of the pinnacles of St. Mary's spire were submitted to Convocation on Tuesday by the Vice-Chancellor. After expressing his high sense of the zeal, labour, and courtesy of Professor Case, whose investigations have been lately summed up in a volume entitled "St. Mary's Clusters," Dr. Boyd gave his reasons for preferring the design of Mr. Jackson, endorsed by Mr. Bodley, though not by Mr. Jackson himself. The other design of Mr. Jackson he regarded as of great architectural merit, and if it was a question of building on a new site it would be the one he should select. But, taking all things into consideration, he should vote for plan D—i.e. for the reproduction of Mr. Buckler's design with the pinnacles lowered. To the ordinary untrained eye the cluster would appear unchanged, but the architectural eye would be satisfied. He hoped a plan would be selected avoiding a delegacy with its delays and responsibilities for himself and the proctors.

Professor Pelham said he must vote for a delegacy, as intricate considerations were involved, though he thought their deliberations need not be prolonged.

Mr. William Morris said it would be a pity to refer the matter to a delegacy; one thing was impossible, namely, to restore the fourteenth-century spire. He was in favour of repairing Mr. Buckler's work as the object of his boyish affections. But, further, he wished to plead for certain persons of whom hard things had been said, who were accused of having lost not only their hands but their heads. For these statues he was a thick-and-thin advocate. What difficulty there was in retaining them ought to be faced. The question was not whether it was desirable to retain them, but whether it was possible. But it was possible, and any necessary disfigurement would be better than destroying them or removing them to a museum, which would be equally destroying them architecturally. They were, in fact, the only fourteenth-century work

remaining, and every step should be taken to preserve them. A rider should be added giving this direction to the architect.

Mr. Strachan Davidson appealed to Mr. Jackson to meet Professor Case's point, that the weight of the proposed double gables would tend to the ruin of the tower.

Mr. Child remarked that if Mr. Buckler's restorations had made the spire less beautiful than before, youthful attachments should not prevent something better being substituted. He still recalled the painfully dwarfing effect of Mr. Buckler's pinnacles when revealed by the removal of the scaffolding. As for a delegacy, it would be hard to get six bold men to face certain and general abuse.

Mr. Jackson said that, while he had been guided by the principle that not a stone should be tampered with of whatever remained of original design, where there was nothing to guide one, archæology would only hamper, and it was reasonable to aim at beauty. Now we could never know what was there before 1611, while to restore the design of 1611 would, he hoped, never be proposed, though to keep it would have been another question. As to the question between oblong and square piers, which was being fought by Professor Case, on the authority of Pugin he preferred Mr. Buckler's authority for oblong piers, since he had the advantage of scaffolding, and was bound for his own sake to take accurate measurements. Both sketch and measurements of Mr. Buckler he held in his hand, and now paid a tribute to the knowledge and taste of Mr. Buckler and the spirit in which he had approached the work. Of his own designs, the one he had laid aside as unsatisfactory he had incautiously shown to Mr. Bodley, who had preferred it. He himself rejected it because the pinnacles seemed to stand away from the spire and to dwarf it. In reply to Mr. Davidson, he might say there was no fear for the tower. Each group of pinnacles weighed about sixty tons, but the whole mass would almost stand without the spire. He might add that he had received a letter from Mr. Penrose eulogistic of the plan he himself preferred, and saying that Oxford had never been the same to him since the erection of Mr. Buckler's lofty pinnacles.

Professor Case disputed Mr. Jackson's estimate of the value of Pugin's observations. He was for a delegacy which need involve no delay, and which would give each design its fair chance. He dwelt upon the importance of the difference between oblong and square piers, and criticised adversely the design of Mr. Buckler and the compromise of Mr. Jackson. He challenged the latter to produce an example of a four-sided pinnacle, rising from eight gables upon a four-sided shaft.

Mr. Jackson observed that the overhanging of the shaft was found to be only $3\frac{1}{2}$ inches, which was a negligible quantity—that the design preferred by him saved on each cluster 10 tons of stone, and that the expense of it would be 530% less than the restoration of Mr. Buckler's design, and 300% less than his own alternative scheme.

Nine votes were given for the reproduction of Mr. Buckler's design; 11 for the design of 1611; 102 for Mr. Jackson's design preferred by himself, and 32 for his alternative design preferred by Mr. Bodley. On the third design being submitted as the substantive proposal, it was lost by 107 votes to 81, after which the proposal for a delegacy of six to be appointed by the vice-chancellors and proctors, in addition to themselves, to appoint an architect and select one of the present designs or a new one, was carried by 123 votes to 13.

TESSERÆ.

Mediæval Coffins.

STONE coffins were most common during the thirteenth century; they were, however, chiefly used for the interment of the upper classes, from the eleventh to the fourteenth century, after which they were generally, though gradually, superseded by coffins of lead, which latter are found to contain bodies embalmed, or preserved in cerecloths, much oftener than those of stone. The lids of the stone coffins were generally raised to the level of, or a few inches above, the pavement; and they are often found carved with crosses, or sculptured in high relief. The more ancient are angular, or ridge-shaped; and they form, indeed, the earliest specimens in this country of the monumental relics of the Middle Ages. Leaden coffins, though occasionally used earlier, as at the interment of Stephen, who died in 1154, and was buried in one at Faversham, in Kent, were not common till the fifteenth century, when the custom of embalming the body, preserving it in a liquid pickle, or covering it with cerecloth, became prevalent. The ancient leaden coffins were fitted to the shape of the body, and much resembled in form the outer case of an Egyptian mummy: they were often chested or enclosed in an outer coffin of wood, sometimes in one of stone, and have been frequently found to contain the liquid pickle in which the body was preserved. From the perishable quality of the materials, of which wooden coffins

were composed, little respecting their form or shape during the Middle Ages can be elucidated; it is, however, evident that the coffin lid was sometimes of an angular shape, *en dos d'âne*, as it is thus represented in an ancient illustration. In these it is probable that the bodies of the middle classes of society were buried, though even they were often interred without coffins. The bodies of the common people, down to so late an era as the sixteenth century, were only enveloped in a shroud, and so buried.

Egyptian and Assyrian Art.

The monuments of Egypt and Assyria signify two distinct conditions: they express that the Egyptian belonged to times of abstraction—his means of representation were emblematic, and his language conventional; the Assyrian belonged to times more prosaic, and dealt in modes more real. The art of the Egyptian was made almost entirely ministrant to his religious system; that of the Assyrian was more a record of his military triumphs. The personages of his sacred system caused the Egyptian an intentional departure from Nature in the more square—more simplified—more stern expression of human form as the medium of the spiritual idea; the Assyrian, more spherical in his forms, was more material—more realistic in treatments which aimed at a greater degree of anatomical truth, attention to details in accessorial particular, or excellence of execution. The Egyptian yearned after the Ideal—the Assyrian after the Picturesque. The Egyptian expressed Repose—the Assyrian, Action. In their painted monuments they, like the Egyptians, sought to express races and character as much by differences of flat colours or tints as by differences of form.

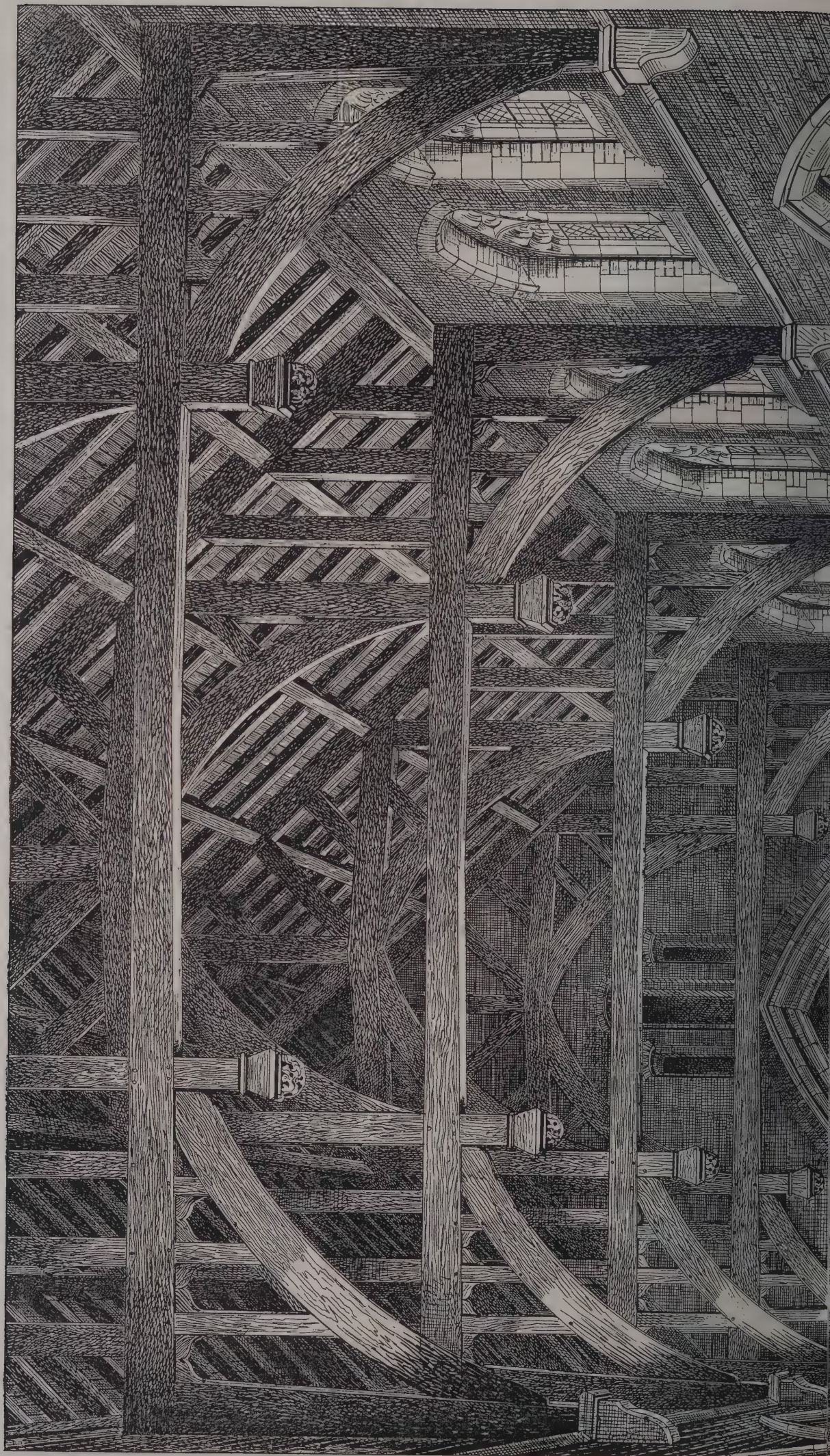
Fireproof Mortar.

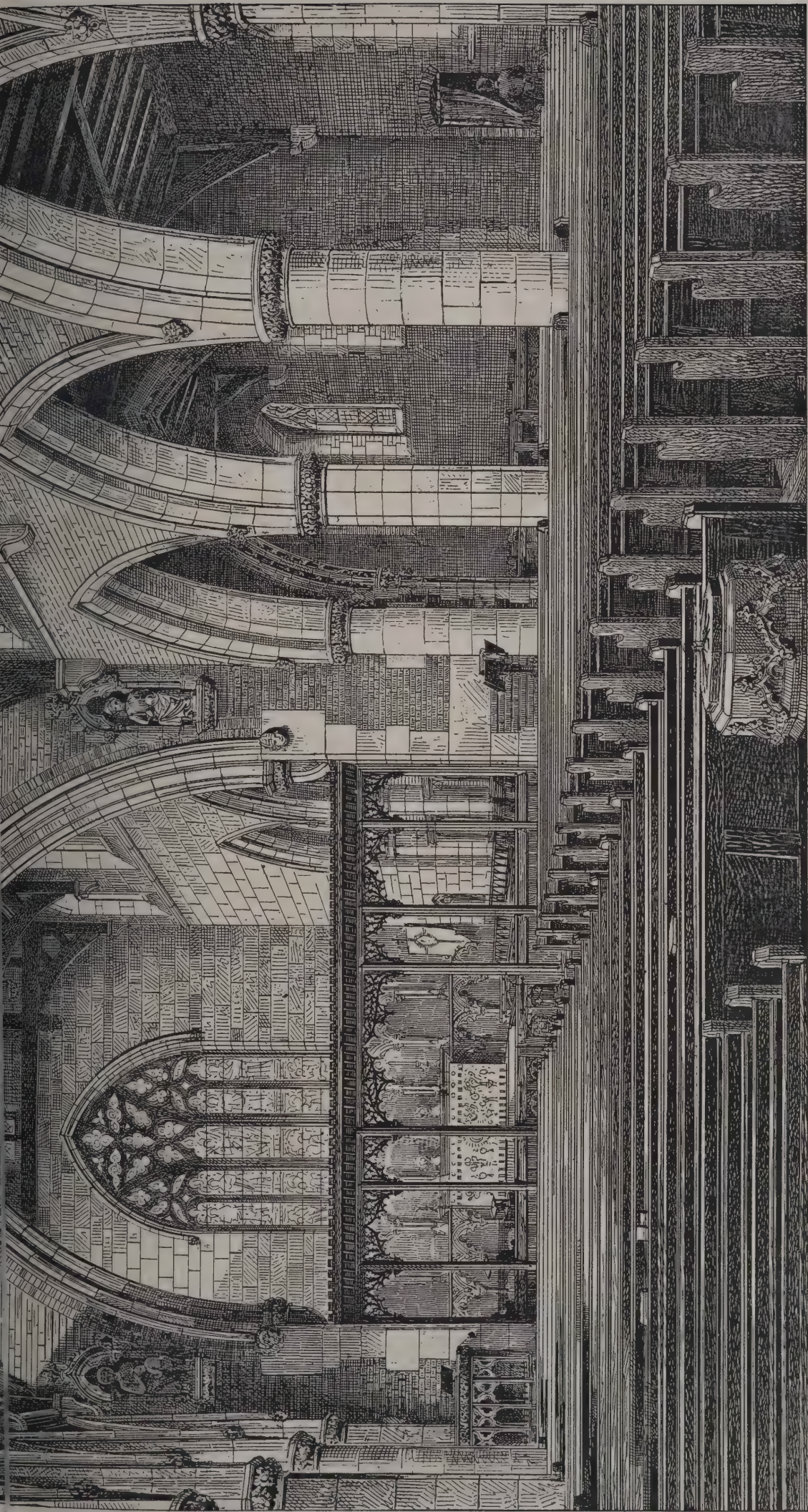
Mortar for resisting the action of fire, and proper to be employed in building slight brick piers as substitutes for, or instead of employing, iron columns, may be made of pozzolano mixed with fresh-ground lime of chalk from the lower beds; and as real pozzolano is an imported substance and likely to be expensive, its place may be very well supplied by an artificial substance of similar character, produced by burning any marly clay that is fit for brick-making to a grey clinker, and reducing such clinker to a grain of the size of coarse sand. Three-fourths of this substance to one-fourth of fresh-ground lime, mixed dry in the first instance, and, when so mixed, rendered plastic by the addition of soft water, will yield a mortar capable of resisting fire for a long time, and water, if need be, as long as any bricks that can be set in it. The same mortar would be excellent, if time can be allowed for the setting as the work goes on, for ceilings, but care must be taken in using it for such purpose to guard against the consequences of its expansion in setting.

Thomas Telford.

A great revival in the study of the properties of elastic matter as regards strength took place about the year 1820, probably in consequence of the introduction of wrought-iron into the construction of suspension bridges, which has been attended with important results. Thomas Telford, though neither the contriver of suspension bridges, nor the introducer of them into Britain, deserves notice from the superior boldness and solidity of the Menai Bridge. Telford (and the same may be said of his contemporary Rennie) was more distinguished as a man of judgment, integrity and experience than as eminently original or philosophical. In this respect both yield to Smeaton, who, with Watt, was the founder (each in his own department) of modern engineering. But the beautiful and truly workmanlike structure of the Menai Bridge inaugurated the era of the extensive introduction of that admirable material, wrought-iron, into great permanent structures exposed to heavy strains. Cast-iron had been used much earlier, as in the bridge erected at Colebrookdale in 1777 by Mr. Derby, and in the very beautiful arch at Sunderland, which dates from 1796. The span of the Menai Bridge is 580 feet, the whole quantity of iron used was 2,186 tons, the transverse section of the suspending chains or bars was 260 square inches, supporting a strain of 1,094½ tons. This was a work quite unexampled at the time of its erection (1826), and showed a sagacious confidence in the employment of a material then comparatively little trusted. Telford never made extensive experiments on the resistance of solids. Some special ones were indeed made under his direction on wrought-iron in particular, but in general he seems to have relied upon the old ones of Musschenbroek and Buffon. The two persons who first in recent times vigorously applied themselves to the practical determination of the data of resistance so long deficient were Tredgold, a private engineer, and Professor Barlow, of Woolwich. The data they obtained have since been generally used, not only in this but in other countries. Tredgold's works (on "Carpentry," "Strength of Timber," &c.) show a very great aptitude in applying the results of science to practice, and an acquaintance with both which is rarely attained. Mr. Eaton Hodgkinson has made many valuable additions to Tredgold's work.

The Architect, June 9th 1893.





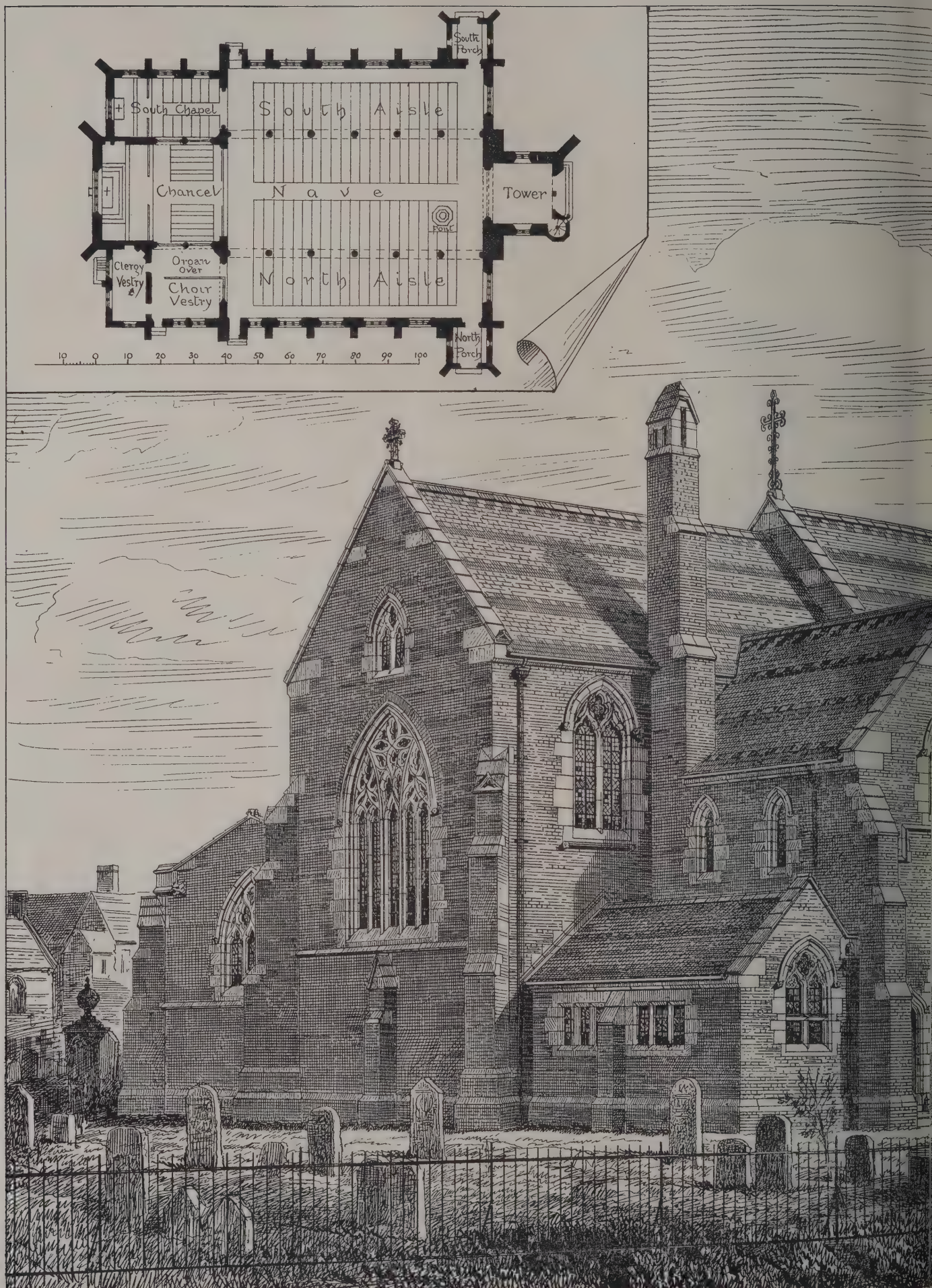
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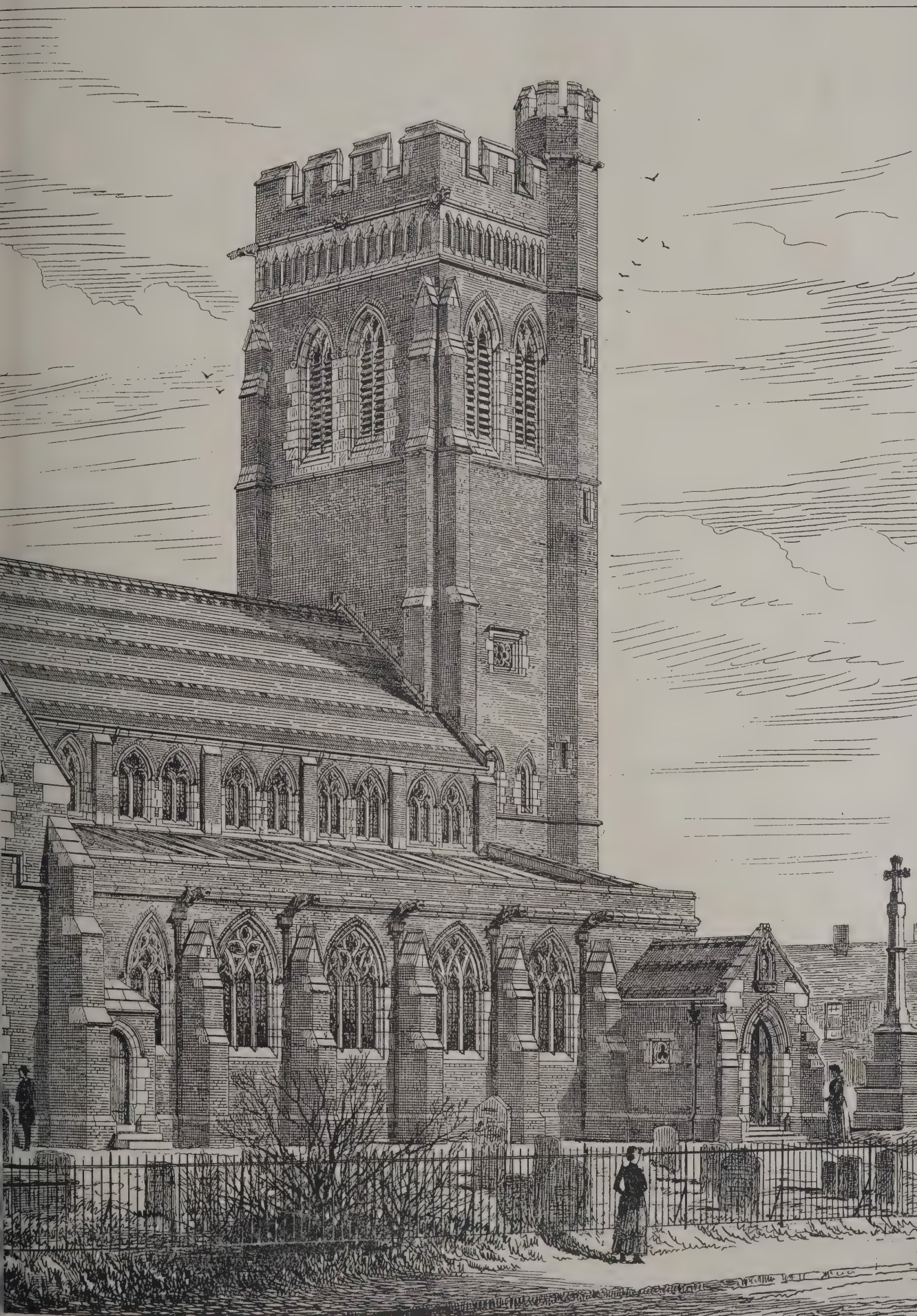
CHRIST CHURCH, FENTON.
CHARLES LYNAM, F.S.A., Architect.





NEW PREMISES, SHOE LANE, E.C.





ILLUSTRATIONS.

CHRIST CHURCH, FENTON.

THE church consists of a nave of six bays, with clerestory and aisles, and north and south porches; a chancel, with a chapel on the south side, and a clergy vestry on the north; also a north transept, containing a choir vestry and an organ chamber. The foundations for a western tower have also been put in. The floor space of the church will accommodate about 1,000 worshippers. The chancel is enclosed by open oak screens, and fitted with oak stalls, whilst benches are provided for the church generally. The style is English Decorated, and was dictated by the requirement of the committee that certain prominent features of the former church should be re-used. In the gable of the north porch a niche has been provided in which a figure of "Our Lord in Glory" has been placed. The chancel is spacious, and the altar well raised. The side chapel has a separate altar, and is fitted with chairs for the daily services. Besides the north and south porches there are two exit doorways at the east end of the aisles. The heating vault is beneath the clergy vestry, and where the hot-water pipes are laid below the floor, openings are formed in the passages above the pipes of pierced terracotta. The chancel is lined with ashlar stone; all the other facings are of bricks both inside and outside, and in each case they are varied in colours not in patterns, but promiscuously, as furnished by the peculiarities of the bricks themselves. The roofs are open-timbered, unvarnished, with an external covering of lead to the aisles and slates elsewhere. The floors are laid with deal blocks and tiles in the passages and sanctuaries. The new church extends beyond the boundaries of the former one into the churchyard, and consequently the disturbance of former interments was necessary; and a churchyard cross of considerable dimensions has been erected commemorative of this unavoidable work. The total cost of the buildings and fittings was something under 7,000/. Mr. CHARLES LYNAM, F.S.A., Stoke-upon-Trent, is the architect.

NEW PREMISES, SHOE LANE, E.C.

THIS building, comprising an area of some 3,000 feet superficial, is being built in a very substantial manner for a printing warehouse. The fronts are of Portland stone (Whit bed), the whole of the front portions of basement being in white glazed bricks (Farnley Iron Company). The builders are Messrs. KIRBY & CHASE, of Hornsey Road, and the architect, Mr. HERBERT KNIGHT, Aldermanbury, E.C.

HOUSE, BROADSTAIRS.

THIS house will shortly be erected for Mr. F. KING-COCHRAM on a piece of land situate at Broadstairs, which adjoins the Coastguards' Station and Bleak House, the house in which CHARLES DICKENS wrote and took the name for his novel. The window of his favourite room overlooks the grounds, the rustic pier (mentioned in his book), the bay, &c. The front, shown in the illustration, will overlook the sea. The lower portion of the house will be built with bright red bricks, whilst all that portion above the level of the window sills will be in depeter work, with the gables half timbered, except the bay window and the quoins, which will also be in red bricks. The roofs will be covered with Broseley tiles. Mr. WILLIAM A. BURR, of 65 Chancery Lane, is the architect.

HYDRAULIC LIFTS.

WE announced last week that Mr. Robert Carey would read a paper on the above subject at the meeting of the Society of Engineers, held on Monday, the 5th inst.

Mr. Carey said that: Having been engaged for many years in the construction and working of lifts of various kinds, he proposed to place the results of his experience before the Society in the hope that the information conveyed might be of practical use to the members. Although he proposed dealing mainly with hydraulic lifts, he thought it desirable to introduce the subject by a brief reference to lifts of other kinds and of lighter character. He need hardly point out that there was an almost endless variety of hand-power lifts, and lifts which are actuated by belting from pulleys or shafting. The latter are generally constructed with worm and wheel gearing, there being three pulleys on the worm shaft, the centre one being half the

width of the others and keyed on to the shaft, the two outside pulleys running loose. There are two belts for driving, one open and the other crossed, and as the open or the crossed belt is brought on to the centre fast pulley, the lift is driven up or down. When the two belts are both clear of the centre pulley the lift is at rest. The balance weight should be considerably heavier than the empty cage, so as to divide the work. Some engineers object to worm and wheel gearing on account of the loss of power by friction, but the worm and wheel has the great advantage that it will not allow the loaded cage to run down. There should, however, be a small brake on the worm shaft applied automatically when the two belts are on the two loose pulleys, clear of the centre pulley. The office of the brake is to cause the lift to stop exactly at the same place, when the belts are struck off by the automatic stops at the top or bottom of the travel of the lift.

There is one form of power lift which has not had the extended use that might have been expected, considering it has been successfully working for many years. This is the continuous passenger lift, which is constructed with a number of cages attached to powerful steel pitched chains, at equal distances apart. They are kept continually moving, and hence the name, the cages always ascending on one side of the well-hole and descending on the other. They move at a slow rate of speed, so that the passengers may step in and out of the cages as they pass the various floors, and with a very little practice one can enter or leave with perfect ease. There is no waiting for this lift, as there is always a cage going up or coming down ready for the passenger to step into. No attendant is required, except to look after the driving engine. The continuous lift might be driven by an electric motor, and would make a good form of electric lift, the motor requiring very little attention.

The electric lift has recently been brought into notice in consequence of the facility with which this form of power can now be obtained, but almost of necessity they must have worm and wheel gearing, otherwise the motor has to be very large so as to run slowly, and the cost of the large motor is nearly prohibitory. There are other objections. It is very difficult to get the worm and wheel so truly cut that the cage moves perfectly smoothly, so that slight waves of motion are felt. Further, it is doubtful whether the electric lift can ever be quite as safe as the hydraulic lift, and safety is an absolute *sine qua non* in all lifts, particularly those for passengers. For these reasons the author is strongly of opinion that it will be long before electric power can compete successfully with the almost perfect application of hydraulic power for passenger use. Lifts are becoming more and more a necessity every day; they are not now regarded as luxuries, as they used to be not many years ago, but they have taken their place as a labour-saving appliance of great utility, and in a great many instances they are absolutely indispensable.

Of all lifts the most important is that used for passengers, and more attention has naturally been bestowed upon each detail connected with these lifts than upon the details of other kinds. The failure of any important part of a passenger lift may be attended by a serious accident involving loss of life, therefore great care has to be taken that all parts are of ample strength for the work demanded of them. This of course is so in all machine design, but where life is directly dependent upon it, special care must be exercised, and many parts may be duplicated simply with this object in view.

He ventured to say, without fear of contradiction, that at present no mode of actuating a lift surpasses, or in fact equals, that of water under-pressure. It may be open to discussion whether high pressure or low pressure is superior. High pressure, it is assumed, is obtained by pumping water into an accumulator loaded to give the desired pressure, and low pressure by gravity from a tank fixed at some altitude. Both systems have their peculiar advantages and disadvantages. The high pressure has the advantage that the machines actuated by it are comparatively small, which is a greater advantage than might appear at first sight. The pipes also are small, and can be run without attracting attention in positions and places where the large pipes necessary for the low pressure would be most unsightly and almost inadmissible, and where, as in most parts of business London, the high-pressure water can be obtained from the Hydraulic Power Company's mains at a very reasonable charge, the high pressure is far the best. But although there are a few other towns fortunate enough to possess the same facility, such as Liverpool, Birmingham, Hull, &c., yet there are many more which depend upon the low pressure from the ordinary street mains, or must produce the pressure for themselves by pumping either into an accumulator or into a tank, and the question has to be decided which is the best. If there is only one lift to be worked, then in most cases it is preferable to pump into a tank placed as high as possible. If many machines have to be driven, then an accumulator and high-pressure pumps are to be preferred. But each case must be considered and decided separately, sometimes one and sometimes the other system being best suited for the case; no

hard-and-fast rule can be laid down as to which is the best in all cases.

The advantages of the low-pressure system are quietness, and that when a tank is used for the water-supply it can be large enough to hold sufficient water for the lift to make several trips after the pumps have stopped working. The disadvantages are the large space occupied by the machinery and pipes and their unsightliness, also the extra cost due to their size. On the other hand, the cost of the high-pressure pumps and accumulator would often be more than that of the low-pressure pumps and tanks, including the larger pipes and machines. Both systems will work satisfactorily. In some cases the low-pressure tanks and pipes are fitted with fire hydrants, and afford a certain amount of protection against fire.

Some idea of the advantage of the Power Company's high-pressure water may be obtained by the following simple calculation:—Their charge is 20% for 100,000 gallons of water used in one quarter, the pressure is at least 700 lbs. per square inch, and the energy stored in the water amounts to about 1,610,000,000 foot pounds. 20% would pay for 600,000 gallons of town water at 9d. per 1,000 gallons, a fair average price, and assuming 50 lbs. pressure per square inch would represent about 690,000,000 foot pounds, there would therefore be a gain of 920,000,000 foot pounds by using the Power Company's water, or a saving of about 57 per cent.

There are very many kinds of hydraulic lifts, but there are two broad distinctions, viz. the direct-acting and the suspended. The direct-acting has the cage or car thrust up by a ram beneath it, while the suspended has the cage pulled up by ropes or chains from above, and it is impossible to say which system is the better. For low travels no doubt the direct-acting is generally the better, but for very high lifts it is questionable whether the suspended lift is not the safer as well as the better for other reasons, paradoxical as it may sound. There is little doubt but that the suspended lift is safer than the direct-acting lift, having the weight of the ram and cage counterbalanced by ropes or chains attached to the cage, and passed over sheaves at the top of the shaft and down to the balance weights. The cage and ropes, as well as the over-head sheaves, are subjected to much greater stress and strain in this form than in the suspended lift, because of the great weight of the ram which has to be balanced as well as the cage, the weight of the cage only having to be balanced in the suspended lift.

For moderate heights of travel there is no safer or better hydraulic lift than that known as the hydraulic balanced direct-acting lift. In this lift the weight of the cage and ram are balanced by a separate machine, called the balancing cylinder. The water actuating the lift never enters the lift cylinder at all, but acts on the actuating ram of the balancing cylinder only. There are several kinds of balancing cylinders, but they all practically consist of a displacement or balance ram, the displacement of which is equal to the displacement of the lift ram. Weights are added to the displacement ram until the pressure created is such that the weight of the empty cage and lift ram will just descend, overcoming friction and raising the displacement ram with its weights. The water contained in the lift cylinder and balancing cylinder oscillates between the two cylinders; when the lift is up it is in the lift cylinder, when the lift is down it is in the balancing cylinder, means being provided for making up any loss of water through the stuffing boxes. The water, in fact, performs the part of the beam in a pair of scales; the actuating water, when admitted through the controlling valve, acts on the actuating ram, exerting a thrust on the displacement ram, increasing the pressure beneath it to the necessary extent to raise the weight of the lift ram, cage, and live load.

The object of the balancing cylinder is to obviate the use of the balance weight attached to the cage by chains or ropes, to get rid of the overhead sheaves, and to reduce the quantity of water used to the smallest practicable amount. In the case of direct-acting lifts working from the Hydraulic Power Company's mains, the one great advantage is the reduction of water used, as the pressure of 700 lbs. on the square inch would in almost all cases be more than enough to raise the weight of the ram and cage with the maximum live load without any mode of balancing whatever, but a lift without balance (as the ram must be large enough in diameter to give strength as a column) if worked much would use such large quantities of water that the cost of working would be almost prohibitive. For instance, if we take a lift of 50 feet travel to raise a load of say five persons and attendant, or about 9 cwt., making 200 trips per day, the ram for this height must not be less than $3\frac{1}{2}$ inch diameter, and would use about twenty-one gallons per trip, which would make 4,200 per day, or 327,600 gallons per quarter, and would cost, according to the Power Company's charges, somewhere about 45%. If, however, the same lift be provided with a balancing cylinder, it would only use eight gallons per trip, or 1,600 gallons per day, or 124,800 gallons per quarter, and the Power Company's charge would be 22% 16s., showing an annual saving of about 88% 16s. by the use of the balancing cylinder; it is therefore well worth the

extra first outlay. But even with the balancing cylinder, as now constructed, the same amount of water is used to raise a light load as a heavy one, the maximum amount of water is always used, although the minimum load may be raised. To construct the balancing cylinder and other parts so that a proportionate amount of water should be used according to the weight raised, is perhaps the only direction in which the direct-acting hydraulic balanced lift can be much improved. Great expense is sometimes incurred in order to balance what is called "the loss by protrusion," that is to equalise the lifting power throughout the entire travel, for unless some means are provided for this, the direct-acting lift will start with a much heavier load than it will carry to the top of its travel, for as the lift ram protrudes farther and farther out of the cylinder, the pressure of water acting on its bottom end diminishes according to the depth. In other words, it loses power exactly in proportion to the weight of water necessary to fill the space before occupied by the ram, therefore if the ram displaces 50 gallons of water, it would lose about 500 lbs. of its lifting power in ascending to the top of its stroke, and must be designed to start with this extra power, hence the loss. In the old form of direct-acting lift, with balance weights attached to the cage by chains passing over top sheaves, the weight of the chains is made to perform this office and equalise the power throughout the whole travel. But where the balancing cylinder is used, some other method must be adopted if the protrusion is balanced at all. In very high lifts it is almost a necessity on account of the great loss of power there would otherwise be, and the extra amount of water that would be used. This does not, however, apply to low-pressure balanced lifts in the same degree as to high-pressure ones, because in the low-pressure lifts the weight of water necessary to actuate the lift may be made to nearly or quite neutralise the loss by protrusion. But this cannot be done with the high-pressure lift, and therefore other devices have to be resorted to, such as enormously heavy chains made of cast-iron blocks for links attached to the moving cross-head of the balancing ram or immensely heavy levers or moving weights so constructed as to gradually increase the weight pressing on the balancing or displacement ram, thus increasing the pressure in the lift cylinder, as the end of the lift ram rises higher and higher, keeping the same pressure always on the bottom end of the ram, no matter in what part of the cylinder it may be. Some of these arrangements for balancing the protrusions are very costly and occupy a large space, the only justification for the extra complication and expense being the extra saving of actuating water, but this generally amply repays the outlay. The economising of water is a very important consideration, as it is a continual saving in the cost of working. This point will be more closely examined later on, when a system in which a proportionate amount of water used according to the load lifted is described.

Direct-acting lifts without any overhead sheaves or ropes, but balanced from below, patented and made by the author of the paper, are suitable only for low pressures. They are quite as safe as the direct-acting lifts with separate balancing cylinder, the power is constant throughout the stroke, and no space is required other than that necessary for the lift itself. The construction is simple, and comparatively cheap. The cylinder is made of the diameter or area necessary to give the lifting power calculated as the diameter of the ram in the ordinary old form of direct-acting lift. It is, therefore, smaller by the clearance round the ram than the old form, but it is bored the whole length. The ram is made of steel as small as strength will permit, and a piston is attached to its bottom end, the cage being secured to the top. The weight of the ram and cage is balanced by a weight working up and down close to the cylinder in the well, and attached to the piston in the lift cylinder by means of chains or wire ropes passing over sheaves fixed to the top of the cylinder. The pressure water, after passing the starting valve, is taken to the bottom of the cylinder in the well by a pipe, and the exhaust is taken from the starting valve into the top of the lift cylinder, there being a large exhaust pipe from the top of the cylinder to the drain. It will be seen that the water is always in the cylinder; as the piston rises the pressure above diminishes, and as it descends the pressure above increases, thus equalising the power throughout the entire travel. The protrusion of the small ram is compensated for by the weight of the chains or ropes to balance weight. This form of lift has been found to be very successful for moderate heights, and is eminently suited for very low pressures of water, or where a very heavy load is required to be raised by a low pressure of water.

Suspended lifts, on account of their greater cheapness and their not requiring a well and cylinder sunk in the earth, are becoming more common than they were a few years ago. They have also been greatly improved in detail and construction. Chains have given place to wire ropes, the multiplying sheaves have been greatly increased in diameter with beneficial results, friction being reduced and the life of the wire ropes increased. For passenger use it is almost the universal practice now to suspend the cage by four wire ropes; for warehouse and goods

lifts sometimes purchasers are content with two, but very rarely one, except for very light loads. When there are four ropes each one is of ample strength to do the work alone, and they are carefully examined at frequent intervals, say once every month, to see if there are any signs of wear, and directly such are detected the rope is removed and a new one put in its place. It is very difficult to imagine that there is much danger from the failure of the ropes, especially if there is a good safety apparatus. It has been suggested that where there is more than one rope to carry the cage, all the weight should be carried by one and the other, or others should simply run idle, merely being kept taut by springs so that no stress or shocks can be communicated to them. By this arrangement it is claimed that the working rope alone will be liable to break; the others having to bear no strains will last much longer and be in a perfectly good condition long after the working rope is worn out. Should the working rope break, the other ropes being comparatively unworn will not be likely to break when the full weight of the cage is suddenly thrown upon them. He had no experience nor knowledge whether the ropes passing over the sheaves without being loaded would last much longer than the rope which had all the weight of the cage suspended thereon, but the probability is that they would. If so, perhaps this alone would be the most effectual safety arrangement that could be applied, as it could not fail to act when the critical moment arrived. Another suggestion is that, in the event of the working rope breaking, the other rope or ropes may be made to exert all their strength to apply the safety cams. It would thus be almost impossible for the cage to drop, or, in fact, descend at all until the ropes were again made right, for, assuming the ropes were so much worn that they were unable to withstand the shock of the weight of the cage being thrown on them, they would still be amply strong enough to pull the cams into action. This they must do before they take any strain at all worth mentioning, and therefore, before any shock could affect them, they would only have to compress the springs that in the ordinary course of working kept them just taut, slightly more than before the working rope broke. That would be all the extra work required of them, for when once the cams were in contact with the wooden slides or runners they would grip and hold fast should the cage be descending, but if ascending they would only drag on the runners but not bite. In the foregoing suggestions the principle is adopted that it is better to wear out one rope first, the others being kept in reserve to meet the contingency of the first rope breaking; if only one out of two or more breaks no great harm is done.

There are many kinds of safety appliances in use for preventing the descent of the cage should the suspending ropes break, and it appears to be the fashion, so to speak, to have for passenger-lifts four steel wire ropes, all doing equal duty, the safety apparatus being so constructed that, should any one of the four ropes break, the others pull into action the safety cams or grips. In most of these arrangements, however, there is the fault that if all four ropes were to break simultaneously the safety gear would not come into action at all; and in some, if two ropes were to break at the same instant, the other two would not apply the safety cams at all. To meet this contingency, a fifth rope of less strength than the other four is provided with the sole object of forcing the cams or grippers into action should all the other ropes break. The multiplication of ropes and the excellent safety appliances now in use leave little to be desired in preventing accidents by the failure of ropes, but there is another inherent source of danger connected with suspended lifts, although happily a remote one, that is the failure of the overhead sheaves or spindles. Beyond making these of extra strength, it is not usual to take any special precaution, the only protection that could be suggested would be a strong floor or grid under the top sheaves, but this would be inadmissible in most cases on account of its unsightliness and the obstruction of light. If, however, proper care be exercised in designing these parts, and testing them before they are erected, very little danger need be anticipated from this quarter.

Whilst considering the question of safety, he drew attention to the construction of entrance doors or gates, for, although not actually part of the lift, they are so nearly allied with it that their consideration should not be parted from it. There are endless patents and proposals bearing on this one point, and in the great majority the idea seems to be that the doors or gates should open automatically when the cage approaches the level of the floor, and close automatically when it passes away. This may be done with advantage at the top and bottom floors only, because when the case is approaching either of these floors the intention is to stop there, but with the intermediate doors it is different. The cage may be going past the floor, when it is worse than useless to open and close the door as it passes. The intermediate doors should be opened by hand, and closed automatically when the cage passes away from the floor. Bolts can be so arranged that the doors can only be opened when the cage is level with the floor. Another good arrangement is to lock the starting rope when the door is opened, the lift cannot then be started until the door is closed. In this case, of course,

the door does not close automatically, but has to be closed by hand before the cage can be moved.

All passenger lifts should be examined and a certificate given by a Government expert or inspector before they are allowed to be used for passenger traffic. Many lifts carry as many passengers during the day as a small line of railway in a country district, and, although the journey is short, if the lift is defective, the danger may be great. The time occupied by the inspection would also be short, and tests might be made in the presence of the inspector, who should have power to withhold his certificate unless he considers the lift perfectly safe. This would ensure that passenger lifts, at least, should be well designed and constructed, up to a certain standard of excellence. The inspection of warehouse lifts, where persons are allowed to travel in them, would soon follow, and the makers of these lifts would so be compelled to turn out good work. Extreme cheapness should not be the first consideration for machines of this kind when absolute safety is of the utmost importance. True economy is not always the same thing as small outlay, a thoroughly good machine is generally cheapest in the long run, although it may cost more in the first instance.

(To be continued.)

LOUTH ANTIQUARIAN SOCIETY.

AN excursion was recently made by this Society to interesting localities on the Wolds. Little Cawthorpe Manor House was visited among other places.

The Manor House was a residence of the Mottram family, and bears a date 1673. It is cruciform with four gables, having brick arches in the walls for the purposes of strengthening them. In one gable is a quartered shield, and in another a stove with the initials I. M. 60. The initials are doubtless that of some member of the Mottram family, one of whom had a seal with a death's head and the motto "Memento mori." A leaden water cistern of circular form, made of plates soldered together, ornamented with scroll work, and bearing the date 1710 was an object of interest.

Haugham wood was said to be part of the primeval British forest through which our painted ancestors ran in savage freedom. Of Muckton (Machetone) Domesday Book says, "There is a church and there are seven acres of meadow. There is underwood one mile long and four furlongs broad."

The rector pointed out the objects of interest. The church is dedicated to the Holy Trinity, and was restored in Salmonby stone some years ago by the late Mr. Fowler, who preserved the Norman arch between the nave and chancel. This arch affords a good example of zigzag moulding. The font belongs to the fifteenth century, and shows marks of the staple and hinge used to secure the cover, as required by an edict of the thirteenth century to prevent sacrilege. An ancient oak door with iron boss is preserved. A tombstone on the floor has the words "Elizabeth, wife of Richard Pickles, Rector of this parish." In the churchyard there is a tracery of the beautiful reticulated window taken from the western wall of the old church, and possibly due to the thirteenth century.

At Belleau (Elgelo) are the remains of buildings called "The Abbey," but which doubtless formed the abode of some noble family. The histories say it was a seat of the Earls of Lindsey, but some old documents speak of Hellowe (Belleau) as belonging to the Wells family. The buildings were surrounded by a moat, traces of which can still be seen. On the north there is an octagonal building used as a pigeon cote, but which was probably used as a garrison house. On the west the famous Belleau springs, from which the name is said to arise, come bubbling from under the wold escarpment and flow away in great volume to "join the brimming river," the Eau. Two archways, groined and ribbed with stone, together with an octagonal brick turret, still remain. The arches, having a double curvature and intersecting mouldings, were relegated to the fifteenth century. The stone used was oolitic and probably Lincoln. In the tower the stair is still *in situ*, the roof is of panelled brickwork, and there is a loophole looking to the north. At the apex of one of the arches and looking into the courtyard, there is a gigantic grotesque face with hairy arms, and one hand grasping something resembling a flower; the other hand is broken. This is locally known as the "Samson Stone," from the long hair of the figure, and doubtless it served as a base for a window above it. In the Willoughby Chapel at Spilsby there is a hairy man, and possibly there is some connection between the two.

The ancient hall used by the servants now serves as a barn, and has the stone tracery of handsome windows now bricked up, but which had glass inserted when the bishop visited Belleau. On the front of the dwelling-house is a vertical sundial of the Georgian period. The springs flow through the garden, and a multitude of trout, large and small, were seen in the transparent water darting hither and thither or hanging suspended motionless. An octagonal baptismal font with most beautiful tracery in the panels, and altogether of very superior

workmanship, was in the garden. This font is said to have belonged to Aby Church, which Cromwell is credited with destroying.

Belleau Church, dedicated to St. John the Baptist, occupies a site on an eminence overlooking the valley. The rector pointed out the various objects of interest. The arcade in the nave is early fourteenth-century work. In the chancel there is the figure of a crusader with a lion at his feet and his legs crossed above the knee, indicating that he had twice visited Palestine. His head is supported by angels, his visor is up, he looks as if the enemy was in view, and his sword is partially drawn. This figure is said to have been brought from Greenfield, and is possibly that of Endo de Greenesby, who founded Greenfield Convent in 1153. In the chancel is an Easter sepulchre and a piscina. In the graveyard there is the base and part of the shaft of a churchyard cross; over the late clerk there is a twelfth-century body stone, which formerly lay in front of the church.

Belleau is associated with Sir Henry Vane, the most able man of the Commonwealth, not even excepting "ye arch rebel" Cromwell himself. Saunders says:—"After the termination of the Civil War this place was sequestered to that eccentric character Sir Henry Vane, who amused himself here on Sundays in assembling and preaching to his country neighbours." Would that the present hour might lend another eccentric "character" of the kind!

In 1636 or 1637 Sir Henry Vane married Frances, the daughter of Sir Christopher Wray, of Ashby-cum-Fenby, and perhaps this may account for Vane living at Belleau.

The next place visited was Haugh, where Mr. Crow read an account of Sir John Bolle, who is buried in the chancel of Haugh Church.

Near Louth, in Lincolnshire, stands Thorpe Hall, an old mansion charmingly situated amongst delightful scenery, and connected with which is an old legend but comparatively little known. The elder branch of the ancient family of Bolle, or Bolles, settled here at an early period, and it is to Sir John Bolle, who lived in the reigns of Elizabeth and James I., that the legend more particularly relates. Sir John was celebrated as well for the gallantry with which he signalled himself as an officer in the army, in the memorable expedition against Cadiz in 1596, as for his activity, bravery and good conduct in Ireland. He commanded at the taking of the castles of Donolong and Lifford, during the administration of the Earl of Essex, by whom he was appointed governor of Kinsale. Queen Elizabeth conferred upon him the honour of knighthood after his return from Cadiz, and it is in connection with this gallant knight and his exploits at this place that the legend of "The Green Lady" has its origin.

Tradition assures us that, amongst the prisoners taken at Cadiz, it fell to the lot of Sir John Bolle to take charge of a lady of extraordinary beauty and of distinguished family and great wealth. This lady the noble knight treated with the care and tenderness which was the right of her sex, by endeavouring to soften and alleviate the heavy weary hours of her captivity. This generous care naturally evoked feelings of gratitude, and these ultimately warmed into love. This resulted in her throwing at the feet of the warrior her riches and her person, and such was her ardent passion that, when released, she entreated him to permit her to accompany him to England as his page. But the gallant knight had a wife at home, and neither the charms of the beautiful Spaniard, nor the powerful influence of her gold, could prevail. Like a true knight, therefore, he returned whither duty and honour alike called him, and the beautiful and inconsolable lady retired to a nunnery, there to spend the remainder of her days in sorrow and seclusion.

On Sir John Bolle's departure from Cadiz, the devoted Spaniard sent, as presents to his wife, a profusion of jewels and other valuables, amongst which was her portrait, taken as she was, dressed in green; a beautiful tapestry bed, wrought in gold by her own hands; and several casks full of plate, money and other treasure. Some of these articles, it is said, were, at the commencement of the present century, still in possession of the family; but the portrait was unfortunately lost, or disposed of in some way, half a century before. The picture being thus in green led to her being called in the neighbourhood of Thorpe Hall "The Green Lady." Tradition further records the superstitious belief that the old hall was haunted by her, and that she used nightly to take her seat in a particular tree near the mansion. It was also said that, during the lifetime of his son, Sir Charles Bolle, a knife and fork were always laid for her at table, if she choose to make her appearance.

The compiler of this account, who was then resident in Louth, well remembers the belief in many superstitious minds, some thirty-five years ago, that "The Green Lady" was occasionally to be seen walking about the grounds at midnight!

But to continue with our story. It seems that the attachment of the beautiful Spaniard to Sir John was such that it became the subject of a ballad, which was subsequently published in Percy's "Reliques of Ancient English Poetry."

Shenstone has also an elegant poem on the same subject, entitled "Love and Honour," concluding with the lines:—

And to the cloister's pensive scene
Elvira shaped her solitary way.

Sir John died in 1606, in the forty-sixth year of his age, and was interred in the chancel of Haugh Church, where a monument was erected to him, with a Latin inscription, bespeaking his accomplishments as a scholar and a soldier. His portrait, taken in 1596, when thirty-six years of age, having on the "chain of gold" spoken of in the poem, and a curious thumb-ring, set in massive gold, with the arms of the family, bearing sixteen quarterings, elegantly engraven and emblazoned, came into the possession of the Birch family, descendants of the Bolles. Captain T. Birch, of the 1st Life Guards, lived at Thorpe Hall about 1808.—Abridged from Chambers's "Book of Days."

The thumb-ring of Sir John Bolle was exhibited at an archaeological meeting held at Louth some years ago.

A clergyman of Thoresby used to offer a quaint prayer for rain "on Aby, Swaby, our town of Thoresby and the little village of Haugh, and my four-acre close in Saltfleetby, and if thou, Lord, dost not know it, there is a little bit of furze bush in the gateway." Mr. Cresswell made reference to a Mr. Bourne who in 1811 resided in Haugh Manor House, and who formed one of Princess Charlotte's escort to England. The house was built in the early part of the reign of Henry VII., and has a range of battlements along the front. The walls are of great thickness, the external casing being brick, and the interior perhaps of rubble. It still retains the great beams crossing the roof. One member was disappointed to find that it was not haunted, but was consoled by the information that there was a subterranean passage to Greenfield Priory, the entrance archway in the cellar being bricked up; but it was said the Greenfield end had been partially explored. Haugh at one time belonged to a family of the name of Hagh, but thereafter passed to the Bolles, there being an inscription in Boston Church to the memory of Richard Bolle, Esq., of Hagh, who died in 1519. In the floor of Haugh Church there are inscriptions to Joanna de Welby and Agnes de Clour, the first and second wives of John de Hagh, without dates; Isabella, wife of Richard de Hagh, dated 1417; John de Hagh, dated 1458; Thomas de Hagh, dated 14—; and Robert de Wyncceby 1425. In the south wall of the chancel is a slab surrounded by several shields fully charged and surmounted by a boar rampant, naissant pierced by a broken spear, and having the legend, "nec temere nec timide" (neither rashly nor timidly), which was the motto of the Thorpe Hall branch of the Bolle family. It is in memory of Charles Bolle, of Haugh, who died on February 8, 1590, and his four wives, Katherina Dimock de Skrivelsby, Brigitta Fane de Badsill in the county of Kent, Maria Powtrelle de West Hallam in the county of Derby, and Anna Dimock de Friskney. It further goes on to say that he was the father by Brigitta of John Bolle of Thorpe Hall, Knight, and Katherina the wife of Edward Carre, and by Maria of Elizabetha the spouse of Thomas Gilby.

On the north side of the chancel is the monument of Sir John Bolle. The knight is kneeling, and clad in armour; behind him are his three sons kneeling with clasped hands, clad in short cloaks with high collars and little shoulder capes, and each wearing a sword. Facing the knight is his lady kneeling with clasped hands, and behind her four daughters also kneeling. The lady has a closely-fitting cap, which permits her fine curls to be seen in front and behind. It has a tail hanging down to the waist. Round her neck there is a large ruff, and under that a collar; the sleeve of her dress, somewhat full at the shoulders, is marked with scroll pattern, and has a button at the wrist. The daughters are all clad alike, having close-fitting caps, slightly peaked in front, with ornaments round the external border. Each has a neck ruff and short shoulder cape and girdle. The figures are well executed and are nearly in full relief. The inscription names his wife and children, says he was distinguished for various erudition and military glory, that he was made a knight for his bravery in Spain, that he founded the colony at Loch Foyle, in Ireland, and that he took the castles of Donolong and Lifford, that he merited well of his country, and died on November 3, 1606. The church walls are of chalk, and are rapidly crumbling; there is a leper's squint or anchorite's hole, two corbels to carry the rood beam, and a twelfth-century arch. In the garden there is the panel of a tomb in Sicilian marble; it bears a shield, but the markings are obliterated. North of the church there is a row of about twenty venerable yew trees; it is said the number used to be seventy. There can be no doubt that Haugh was the seat of a monastery.

At an inquisition taken at Lincoln 22nd Edward III. to inquire into the value of the Manor and Church of Haugh, it was proved by the oath of Walter de Hildyok de Foston, Wm. Sampson de Bennington and others, that the monks of Haugh held one capital messuage, with a dove-cote worth per annum 30s. 4d., one water-mill worth 3cs. 4d. per annum, and 20 acres.

of meadow worth 30s. per annum. "Et sunt ibi spine crescentes in Lonedon pro focali, et valent per annum viginti solidos," i.e. there are thorns growing there in the Lonedon, for fuel, worth 20s. per annum. The monks of Hagh had a yearly rent from possessions in Grantham of 2s. 4d., and in Lincoln the same amount. One hundred and twenty-three and one-third acres lie "warrett" are valued at nothing because they lie in common. The rents of the inhabitants (nativorum) are 6s. 10d. The Church of Haugh was taxed in former times at 26l. 3s. 4d., is not at this day worth 20l., and the aforesaid jurors, being asked if the prior of Hagh or his predecessors possessed any other land or tenements besides the said manor, church, and possessions, answered that they had none. There was one windmill broken a long time since, and not able to be repaired. At the Conquest Haugh was given to the Bishop of Durham.

An interesting relic of the Bolle family was exhibited; it bore a ticket with the following inscription:—

"This hinge is from the door of Alton Church Porch (Hampshire) in which Colonel John Bolles fell (1643) whilst defending it and his followers from an attack made upon them by the Parliamentary forces. The door shews the marks of the bullets fired at the time."

NORTHERN ARCHITECTURAL ASSOCIATION.

ON Saturday the members of this Architectural Association, whose headquarters are in Newcastle, had their first summer excursion to the Hartlepoons. The Association, which was instituted in 1858, now has a membership of 100. Among the party were Mr. J. H. Morton, president, Mr. Joseph Oswald, vice-president, Mr. J. T. Cackett, hon. treasurer, and Mr. Arthur B. Plummer, hon. secretary. Leaving Newcastle the party arrived at Hartlepool at 2.23 in the afternoon. The first visit was to the fine old church of St. Hilda's, where they were kindly conducted by Mr. Carse, under whose direction the work of restoring the grand old tower is proceeding. A walk was then taken by way of the ferry through the docks at West Hartlepool, and thence to the Municipal Buildings in Upper Church Street. The tour wound up with visits to the churches of St. Paul, St. Aidan, and All Saints', Stranton, Mr. Morton, president of the Association, being the architect of St. Aidan's, and the renovator of Stranton's ancient edifice. Although the weather was somewhat showery, a most enjoyable afternoon was spent. The company afterwards dined at the Royal Hotel, West Hartlepool, and took the nine o'clock train home. It is intended to hold more meetings in neighbouring towns during the present year than has been the case heretofore, it being felt that the interest in the Association should be of a more general character. The members visit Durham on July 1, and Sunderland on July 29, whilst the annual excursion is to York, on the 12th prox.

NORTH STAFFORDSHIRE FIELD CLUB.

THE second excursion of the season in connection with the North Staffordshire Naturalists' Field Club and Archaeological Society has just taken place, a report of which is given in the *Staffordshire Advertiser*. The weather was fine and warm, and as the excursion was through some of the loveliest scenery in North Staffordshire, it was scarcely surprising that a larger number than usual turned up. The party travelled from Stoke to Uttoxeter, where they were joined by the leader, Mr. T. S. Wilkins, and thence on to Rocester and to Barrow Hill, the residence of Captain Dawson. A visit was first paid to the site of a Roman camp on the estate, the well which supplied the camp being pointed out on the way through the grounds. The camp itself is admirably placed, commanding a splendid view of the surrounding country, and is an excellent example of its kind. It is also interesting from the fact that numerous Roman coins and pieces of broken Roman pottery have been found close to, and are still sometimes recovered.

Mr. Charles Lynam has given the following notes on Barrow Hill and Wootton Lodge:—Barrow Hill is situated about three-quarters of a mile north of Rocester; the River Churnet flows to its west, Denstone being on the opposite side of the valley. Close to the house now called Barrow Hill are the remains of a camp of Roman origin. The first point which strikes the visitor to this camp is its remarkable contrast to other well-known camps in this county, that at Alton, now called Bunbury Wood, being the nearest, but unknown to the many visitors to Alton Towers. Bunbury Wood is a fair example of the camps not Roman; irregular in shape, following for a large part of its boundary the varying edge of the summit of a deep and steep declivity, surrounded by one or more fosses with their accompanying ramparts, and inclosing a considerable area, from which command is had towards the neighbouring district. Of this class of camp there are many within this county, but this is not the case with those of Roman type, as at Barrow Hill, which is simply rectangular, fairly level on its surface, and had its

straight cross roads from side to side—evinced its use as a soldier's camp, contrasting with those of British or Saxon origin which afforded a refuge for the people of a whole district and their cattle in the time of danger or attack. Roman camps were usually situated on or between or near to their main or bye roads, and a roadway is traceable along the eastern side of this camp at Barrow Hill. This camp and that at Chesterton—the latter being much the larger—bear a strong resemblance to one another in their situation and construction. Rocester is undoubtedly a name of Roman origin, and the same may also be said of Uttoxeter. These two places, not far apart, may be regarded as a centre of Roman remains not even yet fully described or explored. Wootton Lodge is a mansion which for its romantic situation, picturesque effect, and architectural excellence may be said to be unrivalled in this county. It is wholly built of wrought stone, its proportions are magnificent, and as an example of the English Renaissance it is most admirable. The county histories barely mention it, and relate but very little indeed of its owners or builders. So here is an open field for the student of the architectural revival in England and of county history.

POST OFFICE, WASHINGTON.

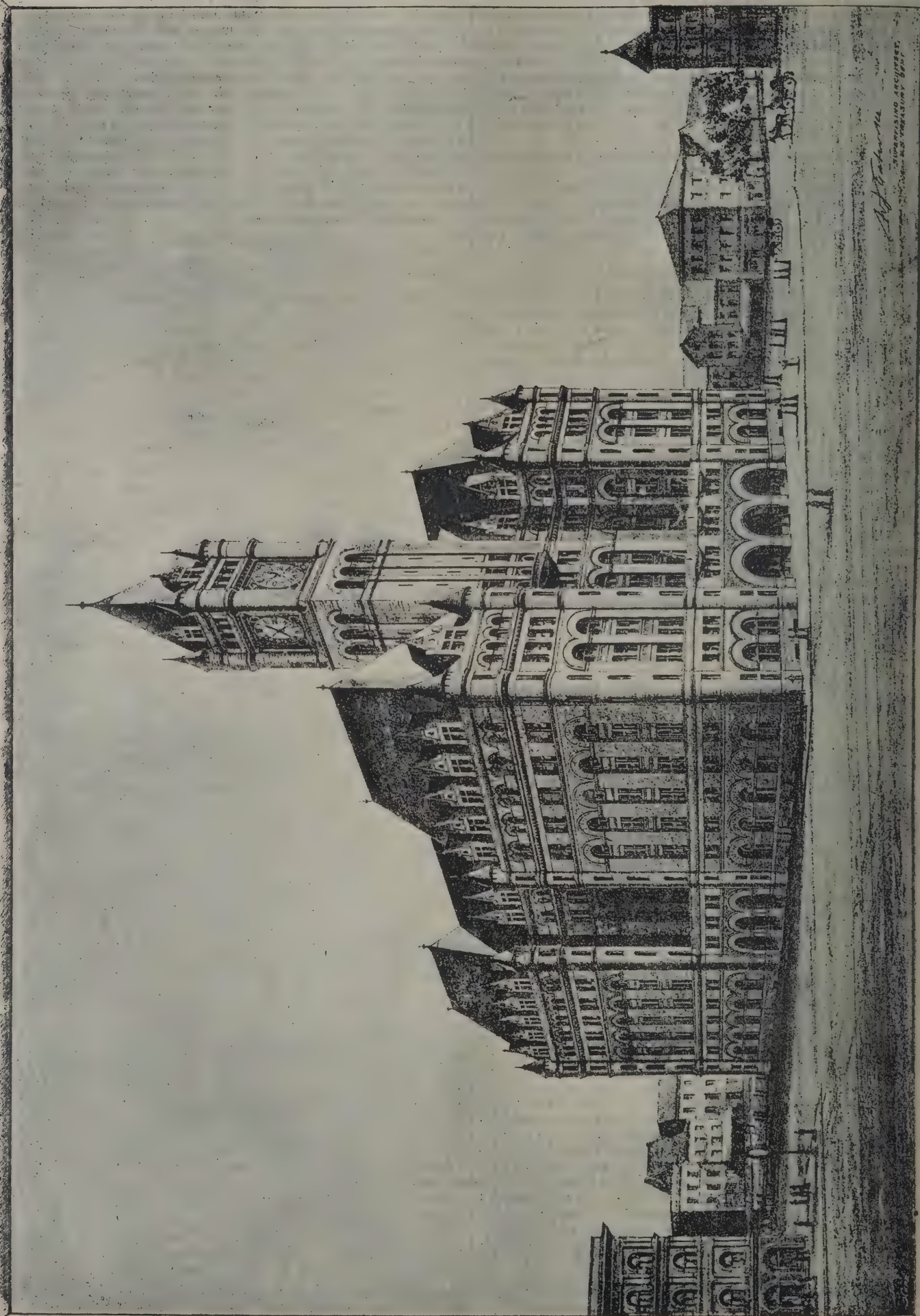
THE building of which we give an engraving is to be erected for the accommodation of the Washington City Post Office, Mr. W. J. Edbrooke, supervising architect, Treasury Department, which will occupy the first floor and all that part of the basement not required for heating-apparatus or elevator and electric-light plant. It is also likely that a large part or perhaps the whole of the second storey will be required for offices connected with the City Post Office, and in the topmost storey sitting-room, dormitory and other accommodations will be provided for the use of railway postal clerks.

The Act of Congress authorising the erection of the building provided that it should be eight storeys in height, but no assignment has yet been made of the large number of office-rooms which will be available in the upper storeys. The building will occupy the entire block (Square 323) bounded by Pennsylvania Avenue and D Street on the north, by 11th Street on the east, by 12th Street on the west, and by C Street on the south. The main front on Pennsylvania Avenue will be 200 feet in length, and the depth of the building to C Street will be about 300 feet. The elevators and staircases for access to the upper storeys will be near the entrances on 11th and 12th Street fronts. The main post-office entrance is on the Pennsylvania Avenue front, and the entrance on C Street will be used entirely by the City Post Office for the receipt and despatch of mail. The height of the tower from the sidewalk to the finial is about 300 feet; the clock-faces, 20 feet in diameter, are about 250 feet above the pavement. The width of the tower is 40 feet and it will be visible from the Capitol along the entire length of Pennsylvania Avenue, and from the greater portion of the various sections of the city. The material used for the exterior will probably be granite. Over the entrance arches of the main front, a projecting balcony, over each, above the second storey, will form supporting pedestals for groups of statuary emblematic of the postal service, the coat-of-arms of the United States, &c. The spandrels of the arches at all the entrances will be enriched with carved ornaments, but there will be but little other carved-work on the exterior of the building. The general plan of the building is that of a series of offices around an interior court. The entire central portion above the second storey will be an open light-well about 100 by 200 feet in dimensions, roofed over with ornamental iron trusses, and covered with glass skylight, around which will be a clear storey of moderate height furnished with movable sash. At the level of each storey the corridors, extending around the entire court and affording access to the various offices, will be floored with glass. These corridors are supported by a colonnade and relieved by ornamental wrought-iron work. The main body of the post-office working-room is immediately under this light-well, and will be protected by a curved glass ceiling, supported by elliptical ornamental trusses which spring from columns independent of those that support the galleries. The spring of these trusses will be at a level somewhat below the first-storey ceiling, which admits of a series of openings above the post-office screen, which will give direct light and ventilation to the public lobby of the first storey. The corridor partitions of all the first floor offices will be of glass, and as glass is used, as before stated, for the ceiling, it is believed that this lobby will be well lighted.

The following are the main features of the arrangement of the post office floor:—On the east of the front entrance will be the public and private offices of the postmaster and assistant postmaster, with necessary toilet-rooms, vaults, &c. Between these offices and the 11th Street or east entrance will be three elevators and a commodious staircase. Beyond the entrance is placed the cashier's office and other subordinate departments. On the west of the principal entrance, extending on 12th Street to the staircase and elevators on that side of

the building, is located the money-order office, with vaults, toilet-rooms, &c. Beyond the 12th Street entrance is placed the registry division with its public lobby. South of the registry division are vaults, toilet-rooms, &c., and the southwest corner of the building is occupied by the apartment for accommodation of mail for both Houses of Congress. The

main lobby between the offices heretofore enumerated and the main post-office working-room is 15 feet in width. The working-room of the office has an area of over 34,000 square feet. Each floor above the first storey will have about 20,000 square feet of actual office space, exclusive of corridors, vaults, toilet-rooms, &c.



EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual excursion of the Edinburgh Architectural Association took place to Cupar and district on Saturday. The members of the Association travelled to Cupar by train, and upon arriving walked to the parish church, where they were received by the Rev. John Scoular. Of the church built in connection with the Priory of St. Andrews in 1415 only a fragment remains. In 1620 the tower was heightened and capped with a lofty spire, which, being off the square, has from one point of view a somewhat curious effect. Inside the church there is a finely-preserved fifteenth-century effigy of Sir John Fernie in armour. Several interesting ancient monuments in the burying-ground were examined. One of these marks the resting-place of the heads of two and the hands of another who suffered martyrdom at Edinburgh about the end of the eighteenth century. Proceeding next to Preston Lodge, the party were received by Mr. John Jamieson, who allowed them full access to his mansion and pleasure grounds. Preston Lodge is a charming piece of seventeenth century work, with a curious blending of classic and Gothic details. The staircase, which in the history of the domestic architecture of Scotland is a matter of considerable importance, is the grand feature of the house. Although only 15 feet by 11 feet 6 inches, it has a quaint and dignified appearance unsurpassed by anything in Scotland at that age. The front rooms contain charming retreats not unlike what are regarded elsewhere as oratories, and over an interesting fireplace there is a pretty panel picture on canvas. As in the case of many of the houses in old Edinburgh, the picture at one time had been hidden beneath a coat of paint. Upon leaving Preston Lodge the party entered brakes and drove to Dairsie Church, three miles distant, where they were received by the Rev. Robert Wright and Mr. Frank Christie. The church was built by Archbishop Spottiswoode in 1621, and is a fine specimen of the quaint ecclesiastical architecture of that period. The founder had a burying vault prepared for himself directly underneath the altar, but as in the case of the Montrose vault in St. Giles, it was utilised for heating apparatus. The Archbishop was buried underneath a flat stone at the entrance to the church. The exterior of the church remains entire, and is surmounted by a remarkable octagonal turret, but the interior has been stripped of all its old features. Dairsie Bridge, said also to have been built by Spottiswoode, but which is mentioned in documents of a much earlier period, was viewed before the party proceeded to the ruins of Dairsie Castle. Ceres Castle was next visited. In an outhouse rapidly going to ruins there are two coffins containing the remains of John, twentieth Earl of Crawford and his wife, who died in the middle of last century. The Earl's body is embalmed, and sealed in a zinc case. The outer coffin is of oak, covered with green velvet and mounted with brass, and the lid is unfastened. The remains of the Countess are sealed in a lead case. A square box of velvet-covered oak, containing the Earl's heart, lies between the two coffins. The party were informed that until a few years ago the remains of the Earl and Countess lay exposed to view, anyone who desired being at liberty to lift the coffin-lids. The gravedigger assured them that before the body of the Countess was finally encased in zinc, someone "put the banes a' back in their richt places." A visit was next paid to Craighall Castle, about four miles from Dairsie. Mr. Thomas Ross (of Messrs. M'Gibbon & Ross), whose researches in connection with the castellated buildings of Scotland eminently qualified him as leader for the day, gave some interesting notes regarding these ruins. The castle, now the property of Mr. Hope of Luffness, was probably built about the end of the sixteenth century in the style then current in Scotland. At the end of the seventeenth century a centre of considerable richness was added to the front in the style of the Renaissance. A gatehouse, still entire, was built early in the seventeenth century. Struthers, about three miles from Craighall, was next visited. The ruins are of considerable extent, and the place is interesting with its associations with "Sir David Lindsay of the Mount, Lord Lyon King of Arms." Scotstarvit Tower was opened to the party by permission of Mr. David Wemyss, of Wemysshall, through Mr. David Osborne, writer, Cupar. The tower is a perfect example of a Scottish keep of late erection, having been built about the beginning of the seventeenth century. It is in good preservation, but uninhabitable. Here Sir John Scott wrote his well-known treatise, "The Staggering State of Scottish Statesmen." From the top of the tower a splendid view was obtained. Cupar was reached again at a quarter to six o'clock, when the company sat down to dinner in the Royal Hotel, under the presidency of Mr. W. W. Robertson, of H.M. Board of Works. Dr. Rowand Anderson officiated as croupier, and amongst others present were:—Professor Struthers, Mr. J. Hippolyte Blanc, A.R.S.A.; Mr. John M'Laren, Dundee; Mr. D. Barclay and Mr. White, Glasgow Architectural Association; Mr. James Bruce, W.S.; Mr. Jamieson, solicitor, Cupar; Mr. Thomson, banker; Mr. James B. Dunn, Mr. John Watson, Mr. Thomas Ross, Mr.

Andrew Muirhead, Mr. Kirkwood (of Messrs. Clark & Co.); Mr. W. T. Russell, surveyor; Mr. T. Fairbairn, hon. sec.; Mr. Wallace and Mr. Giles. A number of toasts were proposed, and the chairman referred to the loss sustained by the society through the death of Mr. M'Lachlan, their leader at their excursion a month ago. The party afterwards returned to Edinburgh, which was reached about half-past nine.

NEW BUILDINGS.

London.—A new Board School in Greenwich Marshes was opened on Monday, May 29, by Mr. J. R. Diggle, M.A., chairman of the School Board for London. The school is erected in Blackwall Wall Lane, built to accommodate 805 children, but with "halls" large enough for a future extension for 1,200 children at a small additional cost. It is built from the design of Mr. J. T. Bailey by Messrs. Treasure & Son, builders.

London.—The head offices of the Capital and Counties Bank, Limited, situated at the corner of Threadneedle Street and Bishopsgate Street Within, E.C., have been reopened in their entirety after undergoing extensive alterations, additions and entire refitting. The original premises occupied the old site of the church of St. Martin Outwich, demolished some years ago, but they have been extended to include the two adjoining properties, Nos. 37 and 38 Threadneedle Street, the whole now forming one building. The basement, ground floor and portion of the first floor are occupied by the bank; the remainder of the premises is arranged as offices for separate tenancy, good accommodation for caretakers being also provided. The original building had been considerably restricted by surrounding rights of light, and, while these have been modified by negotiation, their influence has still been felt to a great extent in the present operations. The entire work has been carried out by Messrs. Patman & Fotheringham, under the direction of the architects, Messrs. Kidner & Berry.

Edinburgh.—At the meeting of the Edinburgh Dean of Guild Court Professor Patrick Geddes was granted authority to erect two blocks of buildings, one to the east of Ramsay Lodge, and the other between Ramsay Lodge and the houses in Ramsay Gardens, and also to make alterations on Ramsay Lodge. This pile of new buildings, designed by Messrs. Sydney Mitchell & Wilson, architects, will occupy one of the most prominent sites in Edinburgh, looking northwards as it does over Princes Street, and westwards over the slopes of the Castle Hill. The westmost portion of the block will contain houses in flats. The eastern portion of the block—which includes Ramsay Lodge—is to be used as a students' home or University settlement. It will contain large dining and recreation halls, and numerous rooms for occupation by students. The buildings are designed outwardly in a varied and picturesque style, intended to recall the past glories of old Edinburgh. At the extreme north-west corner is a circular tower, measuring 85 feet from the ground to the top of the vane which crowns it. This tower is constructed from base to summit of a pale red sandstone. It is divided by moulded string-courses into four unequal stages. The windows in it are few until the top is reached, where there is a range of them separated by stone pilasters, thus forming a lantern. The effect of this tower is to give great solidity to the angle of the building. Abutting on this tower to the eastward is a gable, which, beginning in stone at the ground, projects forward at the second storey, and is carried up with ranges of windows between wooden pillars in a manner which recalls the famous house which formerly stood at the corner of the West Bow. Next this comes a plain wall pierced irregularly with windows and covered with rough cast. Next, again, comes the familiar octagon bay of Ramsay Lodge, now raised in height a storey, and crowned with an open balcony and high-pitched roof. This is succeeded by another gable carried up in stone through four storeys, and then continued in rough cast. In this portion of the building is the recreation hall, which is marked externally by four bold two-light mullioned windows, which run in height through two storeys. In the upper portion of this gable is a quaintly corbelled-out oriel. It is intended finally to make some changes on the roofs of the houses in Ramsay Gardens so as to bring them into harmony with the new buildings. It is not possible to note the numerous little balconies, corners and brackets which occur here and there throughout the buildings and help to give them an old-world air.

Arundel.—The oak roof of the nave of the fine old church at Arundel has been carefully examined and reported on by several well-known architects, and owing to the ravages of worm the main timbers have been condemned as unsafe. The work of entire renovation has been placed in the hands of Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., of Westminster. The roof, which was restored by Sir Gilbert Scott some seventeen years ago, will be carefully copied in detail and renewed in English oak, only such timbers as are found to be untouched by worm being reused. The contract has been undertaken for the sum of 1,058*l.* 9*s.* 7*d.* by Mr. Burrell, builder, of Arundel.



Registration of Plumbers.

Sir,—You will, I feel sure, pardon me trespassing upon your space to state, at this opportune time, in my opinion, a few reasons why plumbers should approve of and support the Bill for Registration of Plumbers now before the House of Commons. Plumbers ought to pass resolutions approving of the Bill, and should obtain the support of trades councils and similar bodies to the measure, and through such bodies solicit the support of members of Parliament to the Bill.

Plumbers (this does not mean any who appropriate the title of plumber) are, and always have been, proud of their trade, and their efforts have always been to execute work of a sterling and reliable character, and of credit to the trade. But to some extent these desires during recent years have been overshadowed and placed under a ban by sanitary authorities and such like bodies through the jerry-work permitted, and in many cases carried out by incompetent tradesmen, under the supervision of the bodies who afterwards condemned the genuine tradesman for what he was not guilty of. It is probable, had a law been in existence twenty years ago similar to the one proposed, the sanitary authorities referred to would not have placed implicit faith in anyone who took unto himself the title of plumber. The sanitary authorities would have been able to protect themselves and those they were acting for by being able to demand the sign of qualification, *i.e.* the Certificate of the Worshipful Company of Plumbers, or some such body appointed by law to examine and determine who are qualified workmen.

Ample evidence of the interest and desire of plumbers to maintain their position for excellent workmanship is shown by the self-denial exercised by plumbers in teaching, in practical classes, those who are apprenticed or have been apprenticed to the plumbing trade. In all cases the results have been very gratifying where apprentices and journeyman plumbers only have been permitted to attend the classes.

In some cases these classes have been carried on entirely by the working plumbers, who have been seriously hampered for funds. In my opinion, wherever a number of practical and experienced workmen in any trade are willing to undertake the training of the rising generation, or the improvement of those who have served their apprenticeship, the technical educational authorities, after satisfying themselves of the genuineness of the effort, should assist in furtherance of the scheme, instead of expending large sums in buildings, creating salaried officers, and undertaking to teach any and every one any trade desired, the result being barren and generally disappointing. If it is necessary that anyone intending to be a lawyer or doctor should be trained in classes specially appointed, and the students not hampered by those who have no intention of following such professions, it is much more necessary that there should not be any drawbacks or hindrances to the teaching and studies of anyone in classes in connection with the building trades, seeing the very limited time that is at their disposal.

I trust that the sanitary authorities—no matter what name they are known by—and members of Parliament will co-operate with and assist plumbers in securing a legalised system of registration, whereby the public may be enabled to secure the services of plumbers, and the pretender relegated to limbo—a punishment richly deserved—for the suffering and misery caused in numerous cases, and the unjust stigma that is attached to the plumbing trade through his antics.

It is a matter of surprise and regret to plumbers (employers of practical plumbers I mean, and workmen), to find that opposition to the Bill is raised by ironmongers and master builders. I cannot understand their opposition to the Bill, because in all cases of evidence it was admitted that such a safeguard is necessary to protect the public. At the same time the ironmongers and builders are using every means in their power to prevent the establishment of this remedy. Their only reason, so far, is that it would create a monopoly in the plumbing trade. Let us test the case by analogy. Any vendor of patent medicines must, if he has not obtained a diploma as a chemist, employ one who has secured such mark of ability. Is not the vendor of patent medicines in a similar position to that the master builder or ironmonger would be in if the Bill became law? It does not need a very keen search to find a host of such vendors, who are not qualified chemists, but employ men who are, therefore clearly proving that in this case the qualified chemist has not obtained a monopoly, although possessing the necessary qualification to protect the public. A similar analogy exists in the case of marine engineers; although they possess the sign that they are qualified to construct, build and repair an engine, the firms that have been noted for the manufacture of engines for generations continue to make them, and their business has not decreased.

It is only fair that in all cases where a man proves his ability that he should be entitled to hold the mark of his ability and not his employer; to give an employer, who may be purely a capitalist, a sign whereby the public would be deceived by expecting the capitalist possessed special knowledge would be dishonest, equally as dishonest as certifying that a plumber was a capable and competent joiner, mason or bricklayer. I know that a large number of plumbers work, and in many cases prefer to work, for master builders and ironmongers. And I may add that the only reason why the present system of registration has not been more generally adopted is, because of the number of employers and men who have been registered at the beginning of the scheme who had not the slightest claim to be registered beyond the fact that they either employed plumbers or were known by the name of plumbers prior to 1886.

Plumbers objected to such men being registered, but it was essential that such should be registered at the establishment of the movement.

Let us see how far a monopoly would be created. I must use another analogy. Anyone can treat any person who is sick and cut and carve any limbs, and the fact that it is necessary for a doctor or surgeon to pass an examination before he can practise does not prevent anyone dealing with diseases, &c. (the law prevents them appropriating the title of doctor or surgeon or chemist), and in case of fatal results through inefficient treatment they are liable to punishment by law.

This bill if passed, and I hope it will, does not prevent anyone interfering with the sanitary arrangements of a house, &c.; it is only intended to prevent them attaching to themselves the title of plumber, and to punish them if the work was found defective.

The charge that ironmongers have in many cases been engaged to rectify the work of qualified plumbers requires the usual quantity of salt, and till proof is forthcoming must be attributed to excited imagination, or the hope that the statements will be accepted as true.

Plumbers were fairly free from the attentions of comic papers, &c., till the jerry builders and others usurped the position of the master plumber, who, being a practical man, was jealous of his credit, his reputation and business depending entirely upon the quality of workmanship, and failures then were principally due to the weather and strength of material used.

I appeal to all interested in the advancement of sanitary science, in efficient workmanship, to assist in carrying the bill for the registration of plumbers, and prevent the robbery and jobbery that has been perpetrated and carried on in the name of the genuine plumber. I am yours, &c.,

GEO. B. CHERRY, General Secretary,
United Operative Plumbers' Association of Great Britain and Ireland.

GENERAL.

Professor Kennedy, of London, has been appointed engineer to the Corporation of Edinburgh in connection with the installation of electric light which the Council propose to introduce into the city.

The Private View of the Summer Exhibition of Water-Colours at the Dudley Gallery takes place to-morrow (Saturday).

A Pavement of Roman mosaic has recently been laid in the entrance-hall and principal corridors at the Manchester Art Gallery. The design is of a strictly classical character, in harmony with the architecture of the building. The work has been executed by Messrs. J. & H. Patteson, Marble Works, 36 Oxford Street, Manchester.

The Feoffees of the Common Lands of Rotherham have made a grant of 750*l.* towards the erection of a children's ward connected with the Rotherham Hospital. The extension will be known as the Feoffees' Children's Ward.

Mr. Henry Boys has offered to give 100 guineas for building a tower for the new church of St. Paul's, Walsall, providing that nineteen other persons will contribute a like sum. Independently of the tower, the present works will cost about 10,000*l.*

Mr. Mavor, architect, is to report to the Aberdeen School Board on proposed alterations to be made at Broomhill Place School.

At the Annual Meeting of the Montrose Antiquarian Society the following office-bearers were elected:—President, the Right Hon. the Earl of Southesk, K.T.; vice-president, Mr. Edward Millar, of Rossie Castle; secretary, Mr. R. Barclay, of Inchbrayock; treasurer, Mr. A. Dickson, solicitor.

In a Limited Competition for a proposed new church at Westham, Weymouth, the plans submitted under motto "Pro Aris," by Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., were selected by the arbitrator, Mr. William White, F.S.A., and have since been duly adopted by the committee.

The Statue of the late Professor Fawcett, erected by Sir Henry Doulton in Vauxhall Park, South Lambeth, has been unveiled.

The Architect.

THE WEEK.

THE judgment of Mr. Justice CHITTY in respect of the application to sell the HOPE collection of pictures by Dutch and Flemish masters will not probably gratify the dealers, but it is important for many reasons. In the first place, such a sale would be like the erasement of a coat-of-arms. The HOPES may not figure as nobles, and they are allied to the English aristocracy. But their Batavian origin is a matter of record, which cannot be disputed. THOMAS HOPE was not ashamed that his family were Dutch merchants. BERESFORD HOPE would probably have refrained from "sinking the ship" if he could be assured that one of his race wrote a little book about the necessity of an ornate ritual. The pictures in question were evidence that heredity prevailed among the HOPES as among other families, and that they continued to have a passion for pictures by Dutchmen which represented Dutch scenes. But a new representative has other views, and the pictures are as scorned as if they resembled the old accounts of the house which related to dried fish. So application was made for authority to get rid of the masterpieces. It was made out that, notwithstanding all that was done by various architectural HOPES in building, there was no shelter for the pictures, and they had to be sent to the South Kensington Museum. A dealer took pity on their homeless state, and offered no less than 80,000*l.* for the privilege of protecting them. Why should not his offer be accepted? The Settled Land Act of 1882 is an obstacle. Mr. Justice CHITTY could not see how the pleasant domain of Deep Dene at Dorking was to be benefited by the sale of the pictures, and he wisely declined to approve of the arrangements. In one sense it is an advantage for pictures to be dispersed, but the HOPES were zealous for architecture, and on that account we wish to see their family records preserved, and the pictures were among the most notable of them.

MANY of our readers will remember the outcry which was raised when WILLIAM BURGESS proposed to introduce marble slabs as part of his scheme for the decoration of St. Paul's Cathedral. It was supposed to be an act of *lèse-majesté* against the genius of architecture which all men of good taste were expected to consider as an unpardonable crime. Time brings its revenges. Anyone who will now visit St. Paul's can observe that BURGESS'S idea is being realised on a partial scale and under different conditions. His proposal has, however, been salutary in other ways. Is not the use of marble in all sorts of buildings due to it? Veneering was supposed to be dangerous in all shapes, and thick slabs of precious marble were classed with the "solid mahogany" and "solid walnut" of the cheap furniture makers. Common sense however prevailed, and it was perceived that it was absurd to treat lovely marbles as if they were building stones. When used as BURGESS proposed, it was feasible to embellish the interior of buildings in the worthiest manner. Marble used, according to pseudo-true principles, meant ruin. When we find that many people in Sheffield want to have a marble lining for their staircase we must admit that BURGESS'S influence is still operative, and in course of time we may hope to see many more of his ideas realised.

THE Royal Cambrian Academy is undoubtedly one of the most successful of the provincial painters' societies, and it is gratifying to learn that out of the exhibition at Conway which is now open several pictures have been purchased. Mr. CLARENCE WHAITE continues to serve as president, and his influence and example have aided in many ways to insure the efficiency of the Academy. At the beginning of the present year the Cambrian Academy suffered a great loss by the death of Mr. LAURENCE BAULES, the honorary secretary, who held that office from the first. The Academicians have just elected Mr. PAIN DAVIES as his successor. Mr. SWINFORD WOOD is the new treasurer; Mr. CUTHBERT GRUNDY and Mr. E. A. HORBURY will serve, with the president and treasurer, as trustees of the Cambrian Academy.

It is accepted generally that the strength of a chain is determined by the weakest link, but the discovery of that member is no easy task. A flaw in a link caused much injury on Monday to a statue in Liverpool. In the Royal Institution of that city, among the works of art taken over by the Corporation was a statue of WILLIAM ROSCOE, whose histories of LORENZO DE MEDICI and LEO X. were among the first indications that the interest of the Renaissance was about to be appreciated. The volumes also made it appear that the pursuit of scholarship could be combined with mercantile business. ROSCOE did much for the elevation of Liverpool, and well deserved a statue. The commission for it was given to CHANTREY. A committee of the Corporation decided to place the statue in St. George's Hall. There was no place for it in the great hall, but a good position was assigned it in the north hall or vestibule, where it would have a window for a background. The statue was safely removed from Colquitt Street, the low pedestal was fixed, and on Monday the hoisting of the figure was commenced. The necessary space was almost traversed when a link in one of the chains succumbed to the strain. There was apparently no provision in the shape of a check, and the mass fell. A part of it sank through the sandstone pavement to the depth of 12 inches. The flags must have had some slight elasticity, or otherwise the figure would have been broken in several pieces. The neck being the weakest part gave way, but with the exception of the nose the head has sustained slight damage. The nose must be renewed. A part of one of the shoulders and a foot, with a few splinters from the drapery, have been removed. The marble, as can be seen from the fractures, is close-grained, and undoubtedly very tough. Besides, ROSCOE was represented seated with his hands on a book, and hence there was more solidity of mass than would be possible with a standing figure. The accident is to be regretted, but there will be little difficulty in repairing the damage. It would be fortunate if antique figures were found with no imperfections. The whole of St. George's Hall is dimly lighted, and in the north vestibule the repairs would not be observed if they were not pointed out by the compilers of future guide-books. The statue is not a great work—it will not bear comparison with the sculptor's *James Watt*—and the accident will impart to it a new interest. Liverpool is, however, the last place where one would expect a defect in a hoisting operation.

ONE of our correspondents informs us that an opportunity for studying a problem in acoustics is now afforded at Blackpool. The pavilion on the South Pier is in the hands of the builders. There are several lines of scaffold poles, and the whole of the upper part of the hall is covered with a scaffolding of planking. In other words there is obstruction to sight on all sides. It is remarkable, however, that the acoustic properties of the pavilion have been vastly improved. Whenever a concert is held there every note tells. There is a large band, and if the members are to be heard at their best it is amidst the forest of timbers; this fact is as evident in solos as in concerted pieces. Vocalisation also seems to be improved. It would appear as if currents of sound correspond with currents of air in ventilation and become more efficient by means of some agency to guide and discipline them. There is little likelihood that theatres or concert-halls with rows of pillars will ever find favour with the public, but after some experience of them amateurs might prefer them. Travellers are aware that in foreign churches, like the cathedral of Antwerp, which are cut up into several divisions, the musical performances have a charm that could be called novel.

THE Manchester School Board have decided that the following architects be invited to send in competition designs for School Board offices to be erected in Chapel Street—Mr. HENRY LORD, Messrs. ROYLE & BENNETT, Mr. HENRY E. STELFOX, Messrs. W. WADDINGTON & SONS and Messrs. WOODHOUSE & WILLOUGHBY—and that the conditions drawn up for the competition be approved and adopted, viz. that the successful firm should be paid 5 per cent. on the cost of the building, and the unsuccessful competing firms 10*l.* each.

NOTES, PRINCIPALLY ON ENGLISH "GEOMETRICAL DECORATED" WINDOWS.

II.

BY A CORRESPONDENT.

THOUGH the majority of Gothic windows certainly have lights of equal width, there are many exceptions to this rule. In the lovely nine-light east window of Carlisle Cathedral, in the seven-light one to the east end of Guisborough Abbey Church, and in that of five lights to the south transept of Northborough Church, Northants (the latter previously alluded to for another reason), the central lights are wider than the others, and with telling effect, as the two central mullions are thicker, with an extra order. In the case of the six-light east window of Raunds Church, Northants, it is somewhat different, there being an even number, and the second and fifth lights are the wider. As a general rule, therefore, there is no reason to depart from the more usual practice of the Middle Ages.

Let us now proceed, upwards, to the commencement of the tracery, having considered various points below that line. It is unnecessary to say much about the treatment of the transome, which belongs to a style later than that now being touched upon. But in the elegant Early Decorated four-light west window of Howden Church, Yorkshire, a traceried transome was inserted in the Perpendicular period with excellent result. As the height from sill to the springing-line is nearly 23 feet, the transome seems to strengthen and bind the composition together, without detracting in any way from the majestic proportions. In fact, it may be said the transome serves like a milestone, and as a measure enabling the spectator to realise the great height, in the same manner as the interposition of screens in a church undoubtedly increases its apparent length. The writer, in a very large church of which he was the architect, endeavoured to carry out the principle of a transome in a long window at the west end of the nave, the general style of the building being based on that of the thirteenth century. A square enriched panel, not pierced, takes the place of a transome, and serves to break the great length of the window, the *outer* mouldings of which, externally, are continuous from sill to springing-line of arch. In the gables to churches of considerable height there is certainly abundant precedent for two tiers of windows, with a string-course between them, even where no triforium exists. But the writer has felt that in modern parish churches this treatment suggests to the outsider two storeys internally, or, in other words, a gallery, and so has hesitated to adopt it.

In France and Germany it is quite common for the tracery to start considerably below the springing-line of the window-arch, or, to put it in another way, the latter is highly stilted. Of course this gives more room for the tracery-head and space for a large central circle, but at the sacrifice of grace. The two-light windows to the cathedrals of Noyon and Bourges, France, are examples of what is deprecated. In England, however, this excessive stiling of the window-arch is happily of more rare occurrence. In the great example at Howden Church, previously mentioned, the arch is slightly stilted with good effect, and in a window at Billingborough Church, Lincolnshire, much more so. But owing to the absence of a central circle and the elegant arrangement of the tracery in this latter specimen, as well as from the length of the window, the effect is good. At Northfleet Church, Kent, is a two-light example, and the arch is much stilted in order to get in a huge circle enclosing a quatrefoil. This gives it a singularly un-English appearance without any compensating feature. For in this case the lower part of the circle in the tracery is some inches below the springing-line of the window arch.

Having made these comments on the employment of tracery below the springing-line, it will be well to touch upon the very opposite practice of carrying up one or more lights above the same. Of late years this has been much more commonly done by architects, with the idea, probably, of novelty. For there can be no comparison as regards beauty between the complete tracery-head from springing-line up to apex of window-arch and the incomplete one. The best use of such is to place them in those positions where the admission of the largest

amount of light is of importance, and where the space available for a window is limited. That with three lights at Milton Abbey Church, Dorsetshire, is an instance of the type alluded to. Another effort at novelty in the design of modern windows of Flowing Decorated character is the carrying up of two of the mullions through the tracery-head, home to the arch above, and treating these as "butssets," to coin a word. Or, in other instances, some of the mullions are planned as piers, containing figures in canopied niches. In such as these the tracery-heads get cut up into three or more divisions, and the character of the windows of the Middle Ages is quite lost. The design, in fact, resolves itself rather into three windows more or less partly connected. For it has been said that one of the essentials of a really fine traceried window is the difficulty in dissecting it and making a smaller one out of its parts. There is a certain amount of truth in this remark, but if its principle was admitted as absolutely true, it is to be feared many much-admired windows would be condemned. In fact, it is obviously not practicable to carry out the principle *in toto*. In a three-light window there often comes an awkwardness and appearance of weakness when the mullions are carried up vertically half-way or more between the springing-line and the apex of the arch. This occurs in the space left at the sides, where the mullions commence to form a part of the tracery and converge towards the centre. This illustrates in another way, beyond what has been previously mentioned, the undesirability of running up vertical lines into tracery unless it is done on a regular system, such as that during the great Perpendicular period. There is another weak form not unfrequently found in the heads of lights under the tracery of a window that is not so apparent or objectionable if the tracery is of good substance. This is what Lord GRIMTHORPE, when Mr. BECKETT DENISON, in his "Lectures on Church Building," published many years since, called the "broken-backed" cusp, *i.e.* a trefoil head to a light without the protecting arch over it; or in other words, not trifoliated. He very properly condemned this feature, and little as the writer in general agrees with the architectural views of this noble lord, he can approve in this instance. Though the Decorated two-light window in the chancel of Chartham Church, Kent, is charmingly original in design and has much elegance, it has somewhat the same fault just commented upon, the construction for stonework being essentially weak, and therefore not good. A four-light window in the north aisle of Whitby Abbey Church, of the Early Decorated period, has a traceried head of most remarkable, though beautiful, character, a little resembling the last-named example in some of its features, but treated constructionally in a better manner. But as a general rule the simpler forms are the most telling, as those which are out of the way require much skill to become harmonious, and more frequently than not fail to please the eye. Exeter Cathedral possesses, of course, a wonderful collection of four-light and five-light Early Decorated windows of very diverse design, but all with the roll-moulding taking the place of the more customary fillet as the guiding line. It is stated that there are twenty of the former and forty-one of the latter. As these windows are so well-known it is superfluous to comment upon them. But there are other examples of the Middle Ages which, though showing originality in design, are yet eccentric in composition or positively ugly, without any grace to redeem their oddity. Such a one is the four-light Decorated east window to Evington Church, Leicestershire, where the tracery-head is cut up by cusped square forms, and by the mullions prolonged into the window-arch in such a manner that all the lines seem in conflict, the one clashing with the other. Scarcely less objectionable is a Geometrical Decorated three-light window at the church of Stanton St. John, Oxfordshire, which looks like Reticulated tracery transformed from flowing into straight diagonal lines, resulting in lozenge-shaped openings, well cusped, but much at variance with the outline of the window-arch, the general effect being decidedly ugly. The acme of debased Flowing Decorated tracery is probably reached in a four-light window at Melrose Abbey, in which there is not a single redeeming point, the forms being very poor, the mullions and tracery also extremely thin. A Decorated window in the south chancel aisle of Cartmel Church, Lancashire, has

some noteworthy forms in the tracery, a very small foil not much wider than a cusp-point being used between much larger ones. This affords a pleasing variety.

The treatment of the space between the springing-line and the apex of the window-arch, the most important part, has now been arrived at after a gradual climbing up. What a vast subject for comment does this present! It is very desirable to study the best principles on which the composition of the tracery should be based. Though EDMUND SHARPE published his excellent work on "Decorated Windows" upwards of forty years since, some of the words he then wrote may be profitably quoted at the present day. Speaking of Late Decorated examples, he remarked, page 92:—"The study of the architect seems principally to have been, as in the late Curvilinear period, to fill the window-head with a variety of elegantly-formed proportions, rather than to produce unity of design or a striking and beautiful whole." Although our authority was thus speaking about the work of the Mediæval men his warnings can equally well be applied to some of the productions of modern architects. In some windows of the present time, founded on those of the Flowing Decorated period, this "unity of design" appears to have been lost sight of. A great tracery-head is filled with much-varied forms, elegant in themselves, not struck in with compasses, and having all the perforations of much the same superficial area. This is monotonous, and although it may possess some amount of quiet beauty, has no *grandeur*. It is, moreover, rather hard on the glass-painter, who is puzzled to know how to fill in these small spaces, and therefore forced to remain content with the lights only for his subjects. Now, if there is a good-sized arch in the tracery-head that can be foliated and sub-foliated to a moderate extent in order to bring it into harmonious proportions with the immediate surroundings, the difficulty vanishes. The magnificent Geometrical Decorated window at the west end of Howden Church, Yorkshire, is a good instance of what is meant. Instead, however, of the large central circle is an equally large opening—a spherical square set diamond-wise, so to speak, for the lower half of it is produced by the inversion of the window-arch. There is a great quatre-foliation with sub-trefoil foliation, all in excellent proportion to the much smaller openings in the lower part of the tracery. It will not be out of place at this juncture to allude to the beautiful composition outside the window itself in this example. The crocketed and finialed pediment with its pinnacles, the ornamental paneling and sculptured figure in niche, in the space between the label to the window of the pediment, also the elegant panelling beyond the jambs—all these decorative adjuncts help to emphasise the window, while the tracery of the latter is kept together intact and not cut up as in some of the modern specimens just commented upon.

(To be continued.)

BIRMINGHAM AND MIDLAND INSTITUTE.

ON Saturday last, the *Birmingham Post* says, about thirty members of the Archæological Section took train at New Street Station for Salford Priors, where they proposed to begin the first field meeting of the present year. Upon arriving at Salford the party proceeded in the direction of Cleeve Mill, passing some picturesque thatched cottages and the fine old church of Salford. At the church the Rev. B. Davis (vicar) received the party, and pointed out the chief objects of interest. The church contains specimens of all styles of architecture, from the round-headed Norman to the graceful Perpendicular. There is an ancient parish chest fashioned out of the solid trunk of an elm tree. Here is the burial-place of the Bushell family, to whom the manor belonged in the seventeenth century, and there is a monument to "Thomas Bushell, son of Anthony Bushell, Lieutenant-Colonell for His Majesty Charles the First. He died April 17, 1704, in the 50th year of his age." In the churchyard there is a stone commemorating a venerable worthy who died at the patriarchal age of 309, but the village chiseller probably intended it for 30 and 9. This same artisan, or one of his compeers, is also answerable for a curious carving of Adam and Eve. A winding path beneath the shade of lofty elms brought the party to the old manor-house of Cleeve, where the visitors were received by Mrs. Holtom and family. The delightful old mansion was explored in every part. The extraordinary avenue of yews, 10 or 12 feet high, cut into shape and called the Twelve Apostles and the Four Evangelists; the great manor barn, the carved and mullioned windows, the panelled rooms, the antique family portraits (the

earliest dating from the time of Elizabeth or James I.), the manor court-room, and the chamber where the officer of the Prior of Worcester and his successors was wont to appoint the ale-tasters, rat-catchers, and other functionaries of the manor, as well as to collect the rents and fines due to the lord, all received attention. Even the haunted chamber was visited and the secret of the family hiding-place revealed to the visitors. Here a murder had been committed long ago, and here probably Thomas Bushell, servant and disciple of Lord Bacon, hid himself for more than a year from the Parliamentarians. Access to the hiding hole is obtained by taking up the floor of a little chamber on the upper storey, and the fugitive could bolt himself in in such a manner that the door of his retreat was as firmly fixed as the rest of the flooring of the chamber. Thomas Bushell was much given to mining speculations, and became the farmer of the king's minerals in Wales. He cut through mountains, carried air through them by pipes and bellows, worked for years in draining water, and established a mint for the use of the king during the Civil Wars. He entertained Charles and his Queen in Oxfordshire, where he cut a rock into curious shapes, caused automaton hermits to ascend from the ground with poetical addresses, and caused a sonnet to be sung by some invisible agency from the leg of a table. He died in 1674, more than 120,000*l.* in debt. In the year 872 King Ethelred gave Cleeve to the Priory of Worcester. A bailiff and a collector lived at Cleeve, and the chief tenants furnished the monastery with a boar, money, &c., while the vicar presented the prior with a peahen as a New Year's gift. The Bushells are descended from Sir Alan Bushell, who died in 1425; their names appear in Cleeve register in 1604. Robert Bushell married the daughter of Sir John Fettiplace, Bart., and their son Charles succeeded to the estates and name of his maternal grandfather, and one of the last of the Fettiplaces was buried at Cleeve in 1799, and his escutcheon hangs over the hall door of the manor-house.

After the house had been viewed Mrs. Holtom regaled the visitors with strawberries, and the party left for North Littleton, where they were met by the Rev. F. S. Taylor (vicar), who explained the chief objects of interest in the church and great barn built by the monks of Evesham Abbey five centuries ago, permission to view the barn having been kindly granted by Mr. William Lidsey. From North Littleton the way led by field paths to South Littleton, across ridge and furrow, one of the best examples of Saxon cultivation left in this county. Here the "yard lands" are distinctly marked, and the ridges are yet high above the furrows. The Vicar and Mrs. Taylor received the archæologists, and hospitably entertained them to tea on the vicarage lawn, a most delightful spot, shaded by cedars and Wellingtonias, and fragrant with the perfume of many roses. After a walk of nearly four miles rest and refreshment were most acceptable. After tea a move was made in the direction of the church, where the Rev. F. S. Taylor gave a graphic description of the history of the sacred building. The door, font and some of the walls are of early Norman work, but the foundation of the church is considerably older, perhaps dating from Saxon, or even Romano-British days. One of the chancel windows is carved out of a single stone; there are fragments of ancient glass, a fine decorated porch, interesting carvings and encaustic tiles—the latter of the usual Worcestershire type, similar to those made in the fourteenth century at Malvern and Droitwich, but some of them differing in design. One ornamented with the five wounds of our Lord was especially interesting, and scarcely less so two shields with the arms of the De Clares, Earl of Gloucester, and the arms of Gloucester Monastery. An old mansion opposite the church was also visited, and from the roof some of the party obtained a fine view of the surrounding country, and examined the curious mechanism connected with the weathercock. Carriages then arrived, and the party were taken to the Crown Hotel at Evesham, where supper was provided. After supper Abbots Lichfield tower and the abbey ruins were inspected, and then the party assembled at the station and returned to town by the 8.50 train, having spent a most delightful half-day in the country under most favourable circumstances.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT the meeting of this Association a paper was read by Mr. John Rogerson on "Woods." Dealing chiefly with the pine series, an account was given of the different varieties, their qualities and defects, with a comparison between log and deal timber in reference to their use in building. The various ports of shipment were also referred to as an indication of quality and as a guide to selection. Touching briefly on a few of the less important timbers, kauri pine was noticed as having come largely into use recently, and as being very suitable for some purposes, although perhaps not adapted for joiner-work generally. The discussion was opened by Mr. Charles Gourlay, and at the close a hearty vote of thanks was awarded the lecturer.

SKETCHES AT ALKMAAR, N. HOLLAND.

WE give in continuation a few odds and ends of old work at Leyden and Haarlem, from sketches by Mr. F. T. W. Goldsmith, made in 1886—two from the Town Hall, Leyden, and two from Haarlem, some houses near the Amsterdam Gate and a fêche on the roof of Jans Kerk.

The other sketch is an old church near Alkmaar—name of the village forgotten. The church, as will be seen, has suffered rather badly at the hand of the invader, until at present the only portion used is the part crowned by the inevitable turret.

Leyden. Holland.



The Stadhuis -

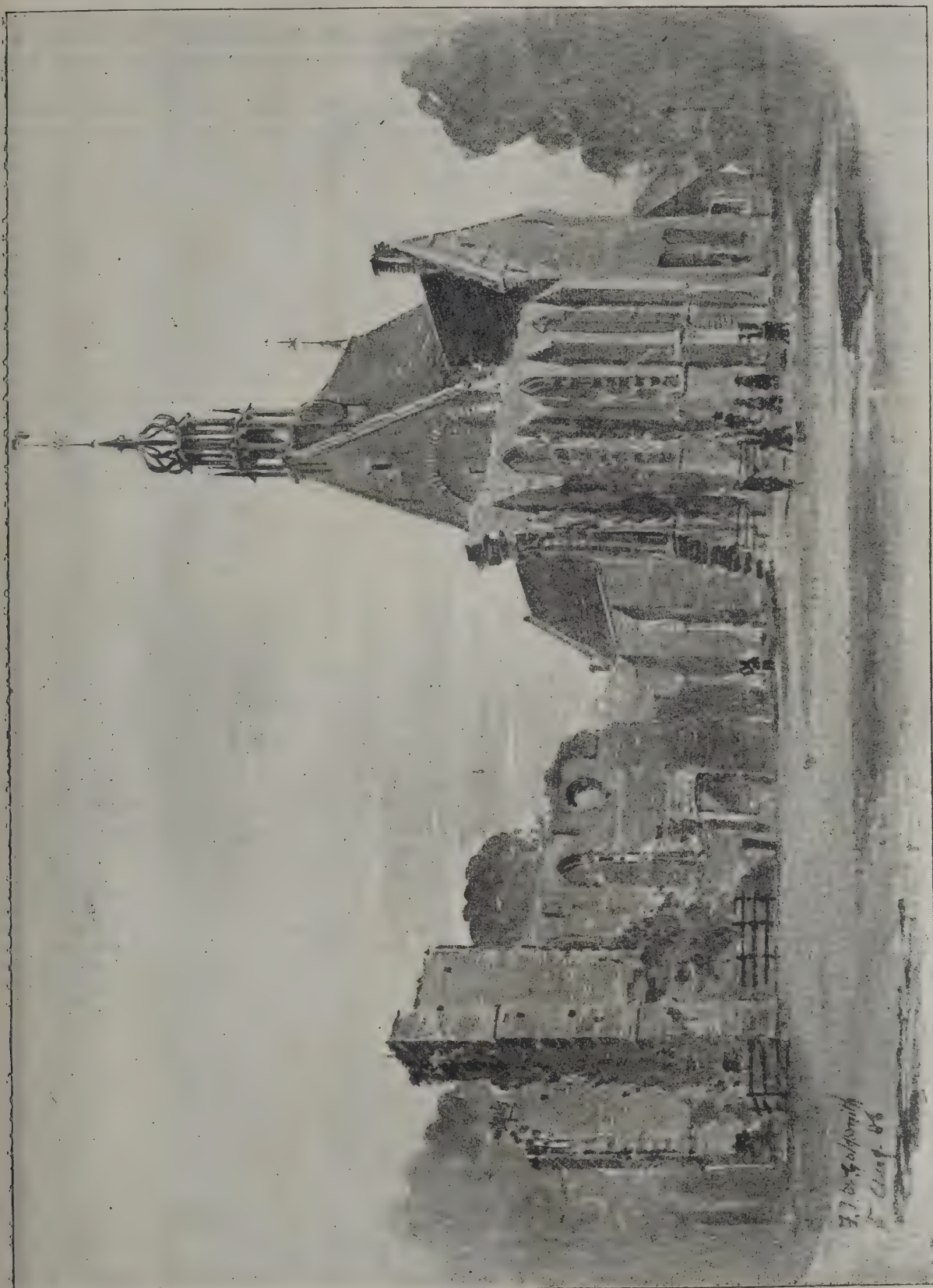
Haarlem



Haarlem

Houses in the street in Amsterdamse Poort.

Huis Jans Kerk.



OLD CHURCH NEAR ALKMAAR.

SITE OF AN OLD HOUSE IN EDINBURGH.

THE Lord Provost's Committee of the Edinburgh Town Council lately had under consideration a motion by Dean of Guild Miller, in connection with the commemoration of the site of the house of Sir Simon Preston of Craigmillar "forenent the Cross," in which Queen Mary is said to have slept after her surrender to the Confederate Lords at Carberry Hill, June 15, 1567. The committee had before them a memorandum on the subject prepared by ex-Bailie Miller, showing on an examination of numerous historical records that the house in question stood partly on the site of the present entrance to the Royal

Exchange, and partly to the west of it. After talking over the matter the committee resolved to recommend that there should be placed on the west side of the entrance to the Royal Exchange an inscription in these terms:—"On this site stood the mansion of Sir Simon Preston of Craigmillar, provost of the city of Edinburgh, 1566-67, wherein Mary, Queen of Scotland, spent her last night in Edinburgh (June 15, 1567), after her surrender to the Confederate Lords at Carberry Hill, from which mansion she was conveyed to Holyrood on the following evening, and on that evening sent off to Lochleven Castle as a State prisoner by the Confederate Lords."

THE INSTITUTION OF CIVIL ENGINEERS.

THE following is a detailed list of the awards made for original communications submitted during the past session:—

For Papers Read and Discussed at the Ordinary Meetings.

1. A Telford Medal and a Telford Premium to Peter William Willans,* M.Inst.C.E. (deceased), for his paper on "Steam-Engine Trials."
2. A George Stephenson Medal and a Telford Premium to Edward Hopkinson,† M.A., D.Sc., M.Inst.C.E., for his paper on "Electrical Railways: the City and South London Railway."
3. Telford Medals and Telford Premiums to Mathew Buchan Jamieson, Assoc.M.Inst.C.E., and John Howell, for their joint paper intitled "Mining and Ore-Treatment at Broken Hill, New South Wales."
4. A Watt Medal and a Telford Premium to John Rigby, M.A., for his paper on "The Manufacture of Small Arms."
5. A Telford Premium to George Edward Wilson Cruttwell, M.Inst.C.E., for his paper on the foundations of the two River Piers of the Tower Bridge."
6. A Telford Premium to Walter Pitt, M.Inst.C.E., for his paper on "Plant for Harbour and Sea Works."

For Papers Printed in the Proceedings without being Discussed.

1. A Telford Medal and a Telford Premium to George Shattuck Morison, M.Inst.C.E., for his account of "The River Piers of the Memphis Bridge."
2. A Telford Medal and a Telford Premium to Robert Gordon, M.Inst.C.E., for his paper entitled "Hydraulic Work on the Irawady Delta."
3. A Telford Medal and a Telford Premium to Alan Brebner,‡ B.Sc., Assoc.M.Inst.C.E., for his paper on "Relative Powers of Lighthouse Lenses."
4. A Watt Medal and a Telford Premium to Herbert Byrom Ransom,‡ Assoc.M.Inst.C.E., for his paper on "A Method of Testing Engine Governors."
5. A Telford Premium to George Morrison Barr, M.Inst.C.E., for his account of the "Improvement of the Entrance of Otago Harbour, New Zealand."
6. A Telford Premium to Alfred Weeks Szlumper,† M.Inst.C.E., for his paper on "The Signalling of the Waterloo Terminus of the London and South-Western Railway."
7. A Telford Premium to Joseph Harrison, Wh.Sc., Assoc.M.Inst.C.E., for his paper on "Radial Valve-Gears—Analysis of the Motion of the Valve."
8. A Telford Premium to Edmund Gregory Holtham, M.Inst.C.E., for his description of the "Chimpas Aqueduct and Mineral Railway, North-West Mexico."
9. A Telford Premium to Charles Sheibner Du Riche Preller,§ M.A., Ph.D., Assoc.M.Inst.C.E., for his account of the "Zurich Water-Supply, Power and Electric Works."

For Papers read at the Supplemental Meetings of Students.

1. A Miller Prize to Charles Davidson Barker, Stud. Inst.C.E., for his account of the "Methods adopted in Constructing the Glasgow Central Railway—Bridgeton and Tron-gate Contracts."
2. A Miller Prize to David Carnegie,|| Stud.Inst.C.E., for his paper on "The Manufacture and Efficiency of Armour-plates."
3. A Miller Prize to John Wilson Steven, Stud.Inst.C.E., for his paper on "The Introduction of Rubble Blocks into Concrete Structures."
4. A Miller Prize to Francis Gibson Baily, B.A., Stud. Inst.C.E., for his paper entitled "Some Points in the Regulation of Direct-current Motors."
5. A Miller Prize to Arthur Shaw Butterworth, Stud.Inst. C.E., for his paper on "The Disposal of Town Refuse by Burning and the Application of the Heat thereby Generated."

For Papers Read at Local Associations.

1. A Miller Prize to William Robertson Copland, jun., Stud.Inst.C.E. (of Glasgow), for his account of "The Tarapaca Waterworks."
2. A Miller Prize to Philip Morris Pritchard, Stud.Inst. C.E. (of Newcastle-on-Tyne), for his paper on "The Relative Water and Fuel Consumption of English and American Locomotives."

* Has previously received a Watt Medal and a Telford Premium.

† Has previously received a Telford Medal and a Telford Premium.

‡ Has previously received a Miller Scholarship.

§ Has previously received Telford Premiums.

|| Has previously received a Miller Prize.

TESSERÆ.

Water-Colour Art.

THE practice in use by the best artists of the day is as widely different from that which was in use on the invention of our present water-colours as the pictures of the two periods differ in quality of every kind—in colour, richness, depth, variety, effect, &c. The great point in which these two styles differ is that the principle of the earlier mode consisted in using a mixed colour, called neutral tint, and this being made up into a cake of colour, served indiscriminately for the shadows of every kind of subject and season, whether the picture was to represent a land or sea piece, stone or brick buildings, evening or morning, sunshine or storm, summer or a wintry snow-piece. The neutral tint shadows were first laid in, and very frequently (perhaps we should say invariably) served also for distances, clouds and foregrounds, and every kind of object. Cattle, sheep, and the bronzed faces of their attendant shepherds, were most impartially shaded with the same neutral tint, after which a variety of thin washes of colour was thrown over these leaden-coloured shadows, on which they produced so little effect that the designation they received in the older catalogues of the Royal Exhibitions, viz. "water-tinted drawings," or "a water-washed drawing," was the best that could be given to them. These "water-washed drawings" presented an ineffective appearance, although many of them were executed with such an exceeding accuracy of pencilling that, in fact, they became untrue to nature when applied to the distances. In general, the artists of those days trusted to their execution with the black-lead pencil or reed pen for the finish; both very ineffective instruments, especially the former, for producing a natural appearance in painting. The black-lead pencil is very feeble, and the reed pen much too coarse (except in very skilful hands); and both too frequently are used to represent an outline where no outline should be visible, as on the light sides of every kind of object, &c. These remarks on the neutral tint style of painting, sometimes a little varied by using Indian ink or sepia, now fortunately obsolete, or nearly so, are merely given as beacons; for it is too palpable that every season, every kind of object, and every degree of distance must have their peculiar shadows, as in nature they have their own proper colours, to require any arguments against this wrong system, more especially as it is hardly any longer in existence, excepting with a very small number of old practitioners; yet these in the handsomest manner acknowledge the superior effect of the modern style. This style may date its true origin with the invention of the modern water-colours, viz. in 1781. It is to the highly-gifted artist, Thomas Girtin, that we are indebted chiefly for pioneering the way in their proper use, and by his excellent works throwing out of estimation the "water-washed drawings" of his time. These, however, still continued in use for some years after the world had learned, as well from the works of Girtin, Turner and others, that the newly-invented colours were capable of rivalling the hitherto-unrivalled art of painting in oil. Since their first invention they have been considerably improved; their different degrees of permanency, &c., are better known, and chemistry has aided the colour-maker; so that we have not much left to wish for, unless some means could be devised to render fixed a few of the beautiful but fleeting colours.

Early Frescoes in Italy.

By a natural but most unfortunate casualty, the best works of the early painters, being generally in more conspicuous and desirable places than those done in their youth, they were the more liable to perish; the rage for novelty destroying, in each successive generation, the works of the preceding one, in order to substitute its own. It is thus that sometimes two or three frescoes are found painted one over the other in Italy. It was thus that the frescoes of Perugino, of Signorelli, and others, in the Sistine Chapel, and in Stanze of the Vatican, were thrown down to make room for those of Raphael and Michel Angelo. When minds like these are in question, the consolation is obvious—we have got better in exchange; but when we read of similar devastations in favour of the Vasaris, Perino del Vagas, &c., of the decadence, the case is different, and one could weep for very despatch. What a scene of beauty, what a flower-garden of art—how bright and how varied—must Italy have presented at the commencement of the sixteenth century at the death of Raphael! The sacrileges we lament took place, for the most part, after that period. Hundreds of frescoes, not merely of Giotto and those other elders of Christian art, but of Gentile da Fabriano, Pietro della Francesca, Perugino, and their compeers, were still existing, charming the eye, elevating the mind, and warming the heart. Now, few comparatively and fading are the relics of those great and good men! While Dante's voice rings as clear as ever, communing with us as friend with friend, theirs is dying gradually away, fainter and fainter, like the farewell of a spirit. Flaking off the walls, uncared-for and neglected, save in a few rare instances, scarce one of their frescoes will survive the century; and the labours of the

next may not improbably be directed to the recovery and restoration of such as may still slumber beneath the whitewash and the daubs with which the Bronzinos and Zuccheros "et id genus omne" have unconsciously sealed them up for posterity—their best title to our gratitude. But why not begin at once? at all events, in the instances numberless, where merely whitewash interposes between us and them. And what are those "Dii minores," that their works should be respected, when those of the Titans of old time lie concealed behind them? Europe would hail such discoveries as the disinterment of another Pompeii; and a stream of pure refreshment would flow forth for mankind from the walls thus struck by the rod of authority, as of yore from the rock in Horeb.

Modern English Landscape Art.

As with the art of domestic incident, landscape painting is also in strict sympathy with corresponding phases in literature and taste. As the former was contemporary with the modern novel, so the latter has appeared simultaneously with the love of travelling and the love of natural description. These passions (we may justly so call them) are due, no doubt, in part to simple increased opportunity; to recent wealth and peace, and multiplied facilities for journeying. Perhaps the more familiar converseance with nature in her loveliness or her terror, the simple sight of Western Scotland, or Naples, or Monte Rosa, has inspired the wish to transfer to our walls what, in verse or in actual vision, has so charmed our senses: perhaps the poetry of physical science has enlightened and enlarged our sympathies: perhaps the very contrast with the civilisation which enables men to travel readily, deepens their appreciation of the scenes in which civilisation has no part, and even the powers of man seem but a little thing before the majesty of nature. However this may be, the love of landscape has been a glorious gain to modern English art, and gives it its most essentially original character. We no longer see trees and mountains through the imperfect eyes of Claude or Poussin; we do not measure the sunbeams by the standard of Cuyp, or the twilight after the proportions of Rembrandt. Yet this great advance was not made at once. A few artists, of whom Crome and Bonington were perhaps the most gifted, worked in a mixed style, blending the teachings of nature with the traditions of the schools. Others felt the inadequacy of earlier attempts, but have been able to free themselves entirely from a different influence. Something of the art of the stage is united with the genuine art of Stanfield; more with that of Danby and Roberts. Yet the careful pictures of ancient temple and castle, of cathedral and palace, which we owe to the last, are almost without precedent—certainly without rival—in all former centuries. The scenery of Danby, whether that of "perilous seas in fairy lands forlorn," or of the hardly less marvellous equatorial ocean, is a creation beyond the fancy of any earlier painters, as the splendid drawing of Stanfield in rock and sea and lake scenery was beyond their achievement.

The Modulus of Elasticity.

The forces tending to alter the figure or dimensions of substances usually called solid may be thus classified: 1. Extending forces, or such as produce elongation in a body when applied in a direct manner. 2. Compressive forces. 3. Force producing detrusion, or the slipping of one portion of the substance over another. 4. Force producing flexure. 5. Torsion or twisting force. The resistance of bodies to extension was examined by Hooke and Gravesande, and is held to be directly as the area of section of the body, and to increase directly as the amount of elongation produced, at least within certain limits. The measure of this resistance Young termed (not very happily) "modulus of elasticity," expressing the force required to produce unit of elongation (or to double the length) of a prism of the substance under experiment. This quantity may be measured either by the length of a depending prism of the substance which would produce the requisite strain, or more simply by the strain expressed in pounds or tons, which, supposing the elongations to increase without limit as the extending forces, would double the length of the prism under experiment. Thus, in round numbers, a bar of wrought iron an inch square will be extended 1-10,000th part by a pressure of one ton—hence the modulus of elasticity is about 10,000 tons. The elasticity of wrought iron remains perfect to about half the breaking weight, after which the elongations appear to double for each addition of about 1-10th or 1-12th of the breaking weight. Thus, in an experiment by Mr. Edwin Clark a bar of wrought iron, one inch square and ten feet long, extended 8-10,000th of its length for every ton of weight up to 12 tons, from which point the extensions nearly doubled successively for every two tons of load, and the bar was finally torn asunder by 23 tons. The compression of bodies proceeds (like the extension) at first uniformly with the load. Some bodies resist compression more than extension (as cast iron); some the reverse (as wrought iron). Substances give way under compression after different fashions. Hard bodies divide into prisms parallel to the compressing force; slender elastic bodies bend laterally;

soft bodies bulge horizontally; bodies of a medium hardness divide into wedges, and the surfaces slide along the plane of the spontaneous fissure. Detrusion marks more particularly the mode of giving way by the sliding of surfaces in the interior of solids. Though seldom due to force directly applied, it is an important element in most cases of the rupture of semiductile solids.

Mouldings as Evidence of Date.

Although earlier styles were occasionally imitated in completing or altering buildings at a later period, the mouldings of the respective eras were always most faithfully preserved. The assimilating process never extended to the mouldings. To however great an extent the earlier portion of the edifice may have been subsequently copied, these important members were always worked in strict conformity with the ordinary system prevalent at the time of their construction.

Architecture, Sculpture and Painting.

Architecture administering to the first necessities of man is of the earliest origin among the arts. In its development, through a succession of periods, it always shows itself governed by certain general principles, arising out of physical laws and mechanical rules. These have met with so much of the concurrent sanction of ages as now to have become of a fixed nature—principles of conduct to the professor, and deemed so arbitrary that any departure from them is considered a violation of propriety. The code derived from ancient Greek practice is, in fact, considered by the best authorities perfect. Sculpture and painting, on the contrary, though equally governed by principles and laws depending entirely on the representation of natural objects, are susceptible of greater variety—the leading characteristic of the inexhaustible source whence their inspirations are derived—nature. On the manifestations of the truth which they make, and the modes in which this truth is exemplified, much of their success depends. They deny to their votaries the implicit submission to types, which, it is contended, must be yielded by the architect. If these are permitted to control the painter or the sculptor to a similar extent, it must be at the expense of his originality; and if he indulge in any set habits of thought, the conventionalities with which he commences must terminate in the mannerism inseparable from such restricted thinking. Of the three arts, painting has most claim to vitality of purpose. Herein she has the advantage over sculpture of enlisting a wider range and a greater number of imitative truths. Sculpture, with the power of producing positive relief, is wanting in the charm of colour as a means of external realisation. Painting, by the aid of light and shade, simulates this relief so peculiar to sculpture, but superadding colour gives the semblance of superficial truths—the external and characteristic traits of hue or tint which distinguish the special object. The eye, that "mirror of the soul" which the sculptor is constrained to render in an abstract sense, and by means little calculated to compensate for the deficient appliances at his command, the painter expresses by agents that will comply with every regard to variety in structural particular—colour, light and shade, and condition—and can thus portray the inward emotions of the soul with a power and intelligence that make the appeal no less extensive than sure. The appreciation of painting and sculpture, based as they are on the imitation of natural objects, is certain, although it may not always be sound; yet the objects themselves, which it is the purpose of these arts to represent, form so many data whence the relative degrees of the truth of the representation can be estimated. The architect, on the contrary, labours under fewer advantages. He must depend on his public to have either a special organisation or a specially instructed intelligence, to have either his plans or his elevations justly estimated, for the principles he applies being abstract, it is more by the material agency he employs that his art is judged. In proportion as he administers to material wants, he is successful. Our daily experience satisfies us of the defective appreciation of this art. One fact is undeniable—that the great beauty of architecture consists in its fitness. How much is comprehended in that single word. Where any fusion of the principles of architecture, painting and sculpture takes place, the inevitable consequence is a certain loss of the separate integrity of the conditions special to each. For example, sculpture becomes too picturesque when it indulges in imitation beyond the range of its means, or when the imitations can only be partial for the want of the use of colour to make them complete, just as painting becomes too sculptural when the formality peculiar to the plastic art—one of the conditions essential to the expression of repose—gives an impression of permanence of action; and both sculpture and painting may become too architectonic if, when not employed for purposes of mural decoration, they are suggestive of forms and spaces that arise out of architectural intention. Our acquiescence, then, in the manifestations of either of the three arts is just in proportion to the degree in which the principles peculiar to each have been complied with by the artist.

NOTES AND COMMENTS.

THERE is a prejudice against St. Helens on account of its alleged unhealthiness, but many of the inhabitants assert that there are other places which are in a worse condition, and that chemical industries are remarkable for their indirect sanitary advantages. The Local Government Board cannot be indifferent to prejudices, and on Tuesday counsel representing the Board took a very decided action in reference to a Bill that is being promoted by the St. Helens Corporation. It is proposed to extend the boundaries by taking in 690 acres of suburbs, in order to have a wider gathering ground for taxes. The Local Government Board, without any intimation to the authorities, informed the Parliamentary Committee that the scheme for dealing with the sewage of the enlarged district was unsatisfactory, inasmuch as there were no provisions for acquiring land and chemical treatment. The medical officer of the place said there was no need for a special process, as the sewage was thoroughly disinfected by the liquids that came from the chemical manufactories and which passed into the stream. It was also asserted that land adapted for setting-up precipitation works was not obtainable within eight miles of St. Helens. The committee, however, adopted the views of the Local Government Board, and the extension of the borough is not to be carried out until the Board has approved of the arrangements for sewage disposal.

A FATAL catastrophe has been reported from Washington, U.S.A., in the collapse of the building known as FORD'S Opera House. The building has been used of late to house one of the Government Departments. It had the unenviable reputation of being the scene of President LINCOLN'S assassination. It would seem that the front of the structure fell outwards when about three hundred clerks were on the premises, the different floors giving way and falling in a pile on the lowest storey. Since the disaster took place it is reported that many, if not all, employed were aware that the building was in a dangerous condition. It is supposed the excavations carried on by an electric lighting company, for the purpose of introducing the light, hastened a catastrophe that very little would bring about. In excavating for a conduit, the workmen reached the foundations of the columns supporting the old theatre gallery. They found additional columns supporting the upper floors, which were more recent, but all rested on the old supports, which were undermined.

THE Corporation of Richmond have just appealed against a decision of Mr. Justice KEKEWICH. The appeal came before Lords Justices LINDLEY, LOPES and A. L. SMITH, who dismissed the appeal. A person named HATCH, having premises in George Street, Richmond, has recently begun alterations with a view of improving his shop. The Corporation, being desirous to widen the street, served HATCH with a notice, under section 155 of the Public Health Act, to set back the front of his shop ten feet. The section in question empowers the local authority, when any house or building has been taken down, to prescribe the line of frontage to which it may be rebuilt, paying compensation for the land that may be taken for public use under such notice. The Corporation applied for an injunction to restrain HATCH from building beyond the line they had prescribed, to Mr. Justice KEKEWICH, who refused the injunction on the ground that the notice had been served too late. The Corporation appealed, but their lordships dismissed the appeal, because, in their view, HATCH'S premises had not been "taken down" within the meaning of the statute.

A VIGOROUS controversy has been conducted in the columns of the *Sydney Morning Herald* between two members of the Royal Institute of British Architects, namely, Mr. CYRIL BLACKET and Mr. HORBURY HUNT, president of the N.S.W. Institute of Architects. The matter in dispute is in regard of shortcomings in the profession, and to judge from the letters before us Mr. BLACKET has the best of the argument, as it is useless to meet practical complaints by routine platitudes. Mr. BLACKET claims to have been a member of the Royal Institute of British Architects some ten years before Mr. HUNT, and says Mr. HUNT describes as

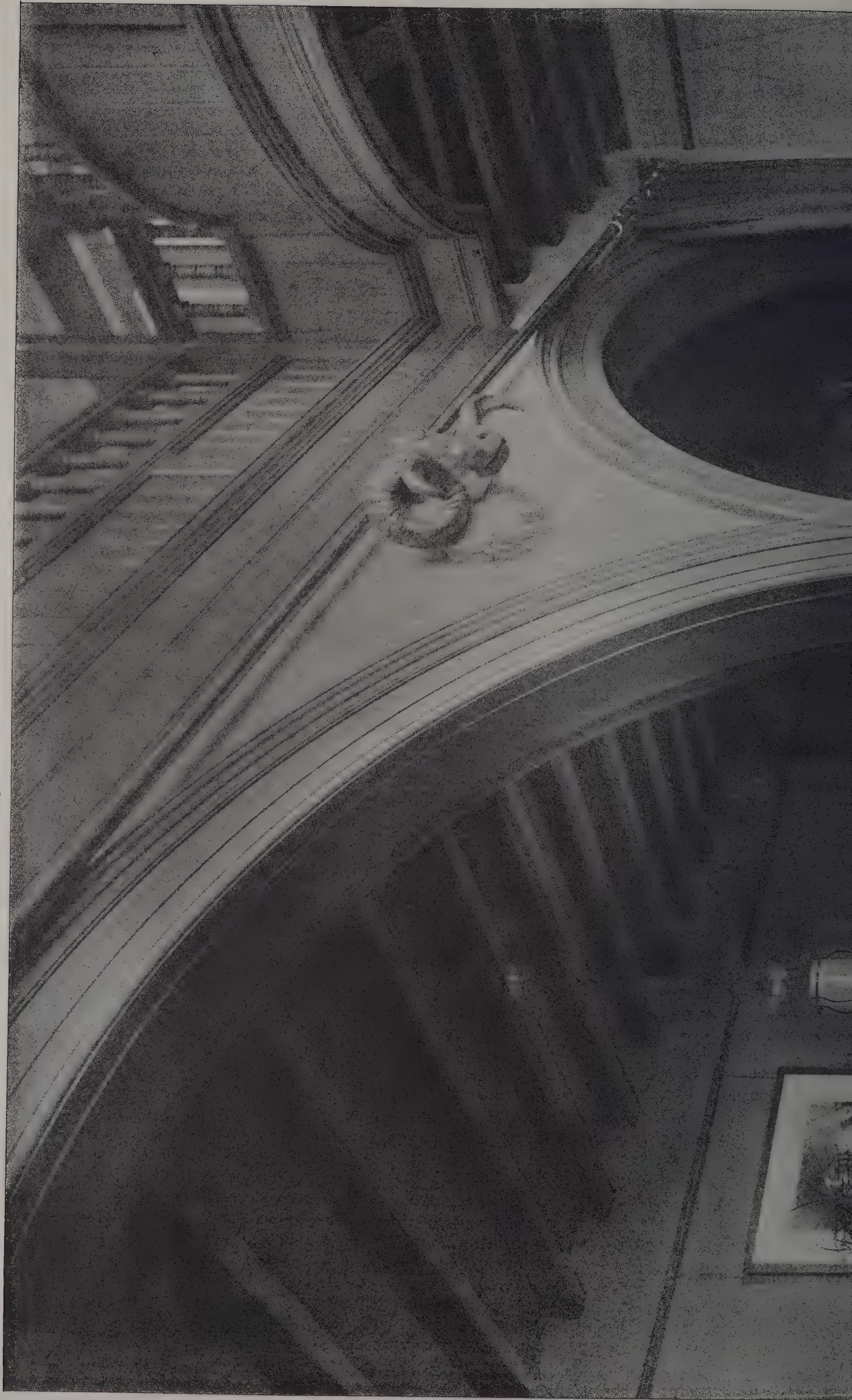
a pleasant reminiscence his having given "me" his "hand to steady my infant steps while walking with him," a circumstance which Mr. BLACKET does not seem to remember. Mr. BLACKET says:—"Mr. HUNT styles himself a man of letters, and with reason, as, in addition to P.N.S.W.I.A., this English affiliation will enable him to put five more, F.R.I.B.A., and apparently he 'hankers' after a few more, as he has chosen promiscuously R.B.P.P.W.—truly a good array, sixteen letters; but it is well to bear in mind that the public have been surfeited with such honours. I have at this moment a letter before me from a builder with the potent letters F.R.I.B.A. after his name, apparently because his connection with the Builders and Contractors' Association afforded his vanity no such opportunity for display."

A LETTER also appears in connection with this controversy in the same paper from Mr. W. NICHOLLS, as follows:—Having seen correspondence in your columns between two architects as to the reasons why a number of buildings are erected without their aid, I think the public should be a little further enlightened. Now, it is well known to every builder in Sydney, and I will venture to say every architect, that a system of tipping has been going on for years between some builders and some architects, and no steps have been taken to put a stop to it. There are, I will admit, a number of architects in Sydney who are upright men, and it is a pleasure to work under them; there are others who will and do ruin the builder, unless he is prepared to hand over black mail. Mr. HUNT speaks of what they are going to do as they get stronger; but every honest builder would like to see a start made and a stop put to this kind of trading. It is no wonder that architects are not better employed, because builders are getting tired of this kind of thing, and in very many instances have managed to influence persons building to do without an architect altogether. The remedy for this kind of thing is, in my opinion, to take away a great deal of the absurd power that the architects claim to have over the builder, and which no proper architect ever requires or uses. It is only of use to the incompetent and blackmailers.

THERE is a time in the life of every Frenchman who studies literature when it is believed that the representative poet of the nineteenth century was ALFRED DE MUSSET. Some adhere to that opinion during their lives, others are less faithful; but if they vary in their allegiance, they are always ready to admit the power of DE MUSSET'S spell. Neither HUGO nor LAMARTINE gained the hold on the French mind which is still possessed by his books. It is remarkable, however, that with all the admiration of him which exists in France, there is no statue of him to be seen in Paris. Men who were born since he died, thirty-three years ago, have been awarded public memorials in bronze or marble, while his name is only to be read on printed pages. An effort was lately made to atone for the neglect, and several of the most prominent of living writers in France formed themselves into a committee and invited subscriptions from their countrymen. The money did not come in. The project must have collapsed if M. OSIRIS, the Greek merchant, had not once more appeared as the champion of French celebrities against neglect and ingratitude. With the same sort of generosity he showed when he purchased M. FRÉMIET'S statue of JOAN OF ARC in order that it might be set up in Nancy, on the borders of Alsace, he has now undertaken to bear all the cost of the memorial to DE MUSSET. This act is most creditable to M. OSIRIS, but when the work of MM. MERCIÉ and FALGUIÈRE is executed it will be enduring evidence of the odd manner of bestowing fame which is found in France.

WE hear that the Ninth Annual Exhibition of inlaying, woodcarving, carpentry, repoussé metal-work, iron, embossed and cut leather, pottery, baskets, rugs, embroidery, lace, hand-spun linen, smocking, bookbinding, wool, home-spuns, &c., will be opened at the Royal Albert Hall on the 22nd inst. Among other matters it has been arranged that a potter will throw vases and pots on the wheel and afterwards decorate them in sgraffiato and barbotine. There will also be demonstrations of Swedish weaving, spinning, inlaying, woodcarving, leather embossing, basket making, &c. The exhibition will close on the 26th inst.

The Architect, June 16th 1893.





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THE COTTAGE, WALTON HEATH, SURREY.
B. VAUGHAN JOHNSON, M.A., Architect



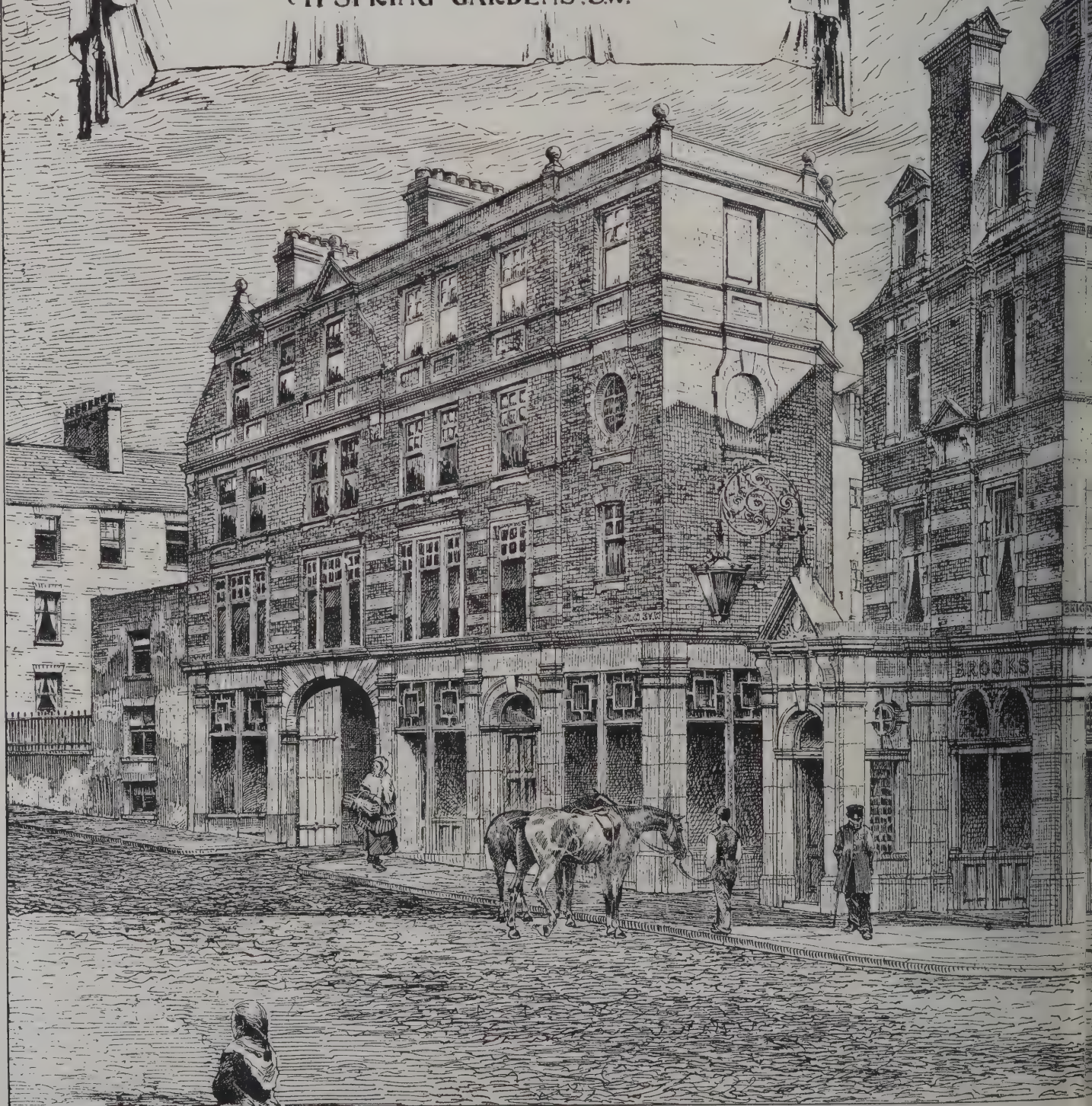


PHOTO-LITHO SPRAGUE & CO 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

"MARQUIS OF GRANBY" P.H.
SHOPS AND RESIDENTIAL SUITES
AND
STABLING

JOINT
ARCHT^s

MESSRS. MARTIN & PURCHASE.
11. QUEEN VICTORIA STREET. E.C.
MESSRS. BOEHMER & GIBBS
11 SPRING GARDENS. S.W.





ILLUSTRATIONS.

THE HALL OF THE COTTAGE, WALTON HEATH.

AN exterior view and plan of this building—Mr. B. VAUGHAN JOHNSON, M.A., architect—has already been published in *The Architect*.

WURTZBURG.

MARQUIS OF GRANBY PUBLIC-HOUSE, SHOPS AND RESIDENTIAL SUITES AND STABLING.

THE block of buildings, as illustrated, covers an area of about 7,000 superficial feet, and the accompanying plan will best show the general arrangements. The stable plan has been very carefully considered, and by means of two entrances (in Down Street and Brick Street) from different levels three floors have been utilised, without necessitating any steep gradients for the horses. Haylofts, harness-rooms and accommodation for the men have been arranged over the stables, which are well ventilated and lighted throughout. The Marquis of Granby public-house covers the exact site of the old house, and the bar fittings and other joiner's work are executed in walnut, panelled and enriched, of a handsome character. The shops in Down Street are constructed to let with basements, and the upper floors contain bachelors' suites. The elevations are carried out in red brick, with stone dressings and granite pilasters to ground floor. Messrs. MARTIN & PURCHASE, of 11 Queen Victoria Street, E.C., were the architects for the stabling, shops, chambers, &c.; and Messrs. BOEHMER & GIBBS, of 11 Spring Gardens, S.W., superintended the erection of the Marquis of Granby public-house. Mr. FRANK KIRK was the contractor for the whole of the works.

WASHINGTON.

IN the *New York World* is an article from the pen of Mr. M. G. Van Rensselaer, from which the following is abstracted:—

It is trite to say that Washington is a beautiful city at this time of the year. But it is not trite to emphasise the part that the season plays in producing its beauty. People who have not seen Washington at other seasons, or who have not inquired curiously into the source of the impression it makes in spring hardly realise how peculiar its beauty is. It is unlike the beauty of any other town I remember either in this country or in Europe.

Travelling through Europe we come now upon a city whose charm is wholly architectural; again upon one, like Edinburgh, whose charm is almost wholly that of site and outlook, and again upon one like Florence, where we can hardly decide whether loveliness of site or architectural dignity plays the greater part in determining its attractiveness. But Washington does not fall into either of these categories.

It possesses, of course, some very fine constructions, and among them two which are as beautiful as any in the world—the dome of the Capitol and the Washington Monument. And it has the advantage of lying beside a wide river with hilly and picturesquely wooded banks. But its fine buildings are scattered and are mixed up with so many which are far from fine, and some of its principal streets are so poor, shabby and heterogeneous that, taken as a whole, the city is by no means architecturally impressive. And, apart from the vicinity of the river its site is devoid of natural advantages. It has neither the hilly streets which give picturesqueness to Edinburgh nor that outlook upon near lofty mountains which makes the beauty of Salzburg; nor does the river run through it and form the chief feature of the actual urban panorama, as is the case in the splendidly beautiful city of Prague.

The beauty of Washington is the beauty of art, not of nature, and yet it is not the beauty of architectural art. It is a beauty which has sprung from the hand of the landscape architect—L'Enfant, the engineer who planned it, and Mr. Olmsted and the other artists in his branch, who have planted and decorated it, have been the creators of its charm to a degree which cannot at all be realised by those who have never seen it.

The White House, for instance, is a dignified, well-proportioned, well-featured building; but deprived of its grounds, standing in a naked square or closely pressed upon by other structures, one would hardly remember it as among the most delightful residences he had ever seen. The Capitol is impressive by its size, and even apart from its beautiful dome, has considerable excellence. But without the wide marble terraces, which Mr. Olmsted planned, and without the grounds which he laid out, it would be shorn of three-fourths of its effectiveness

from any near point of view. And if the scores of squares and circles and other open spots and strips of land, which the intelligent planning of the streets has kept free from buildings, were less charmingly planted, and if every street almost from end to end of the city were not set with a double row of flourishing trees, no one would go home from Washington even in spring with a strong impression of its beauty. Abstract the work of the landscape gardener, and of the engineer who prepared for him, and we should have but a commonplace town, distinguished chiefly by two very admirable constructions—the dome and the monument.

There is a lesson in these facts for all planners of new towns in the West and for all guardians of old towns in the East. The most prosaically planned and crowded of our towns might be vastly improved if the landscape gardener's services were generously called into play. And the planning of Washington is so sensible as well as rich in possibilities of beautiful planting, that it might well be imitated on any flat side. One cannot expect modern planners to reproduce that convenient casualness of street line which renders Mediaeval towns delightful to the eye, but a mere gridiron pattern is not the only alternative. The basis of the street planning in Washington is a gridiron of straight streets intersecting each other at right angles, but the simple and useful device of cutting wide avenues diagonally through this groundwork has meant all the difference between monotonous ugliness and varied beauty.

Nevertheless, I do not wish to underestimate the value to Washington of its better buildings, and especially of the two which I have already twice named. Even a pretty good dome is apt to be a priceless possession to a city, as the aspect of Boston proves; and a really fine dome is a better possession than any other single thing can be, and the Capitol dome is very fine indeed—one of the three or four most beautiful large domes in the world. I know that it is not aesthetically virtuous in construction. I know that it is woven of iron, not built of solid stone or brick, as are the famous domes of the elder world. This fact detracts from its purely architectural interest, but it does not detract from its ocular charm. When Mr. Walter designed its lines he designed a shape of beauty which needs no justification, no explanation—a shape which is satisfying and impressive when seen near at hand, commandingly, enchantingly lovely when seen in the far distance; and, fortunately, one does not see it in the far distance—perpetually, persistently, and over foregrounds of the most wonderful variety. The longer one stays in Washington the more constantly one is on the watch for it, and the more enthusiastically one appreciates it, however and wherever it meets the eye.

But even more remarkable than the dome is the monument, which also and to an even greater degree dominates the city and impresses itself upon the eye and mind of the visitor. There are other domes in the world; there is no other monument of this sort. We compare the chief feature of the Capitol with a few other great monuments; we cannot compare this vast single self-sufficient shaft with anything else, or even contrast it with anything else. It is a unique thing, and I am fast getting to believe that it is the most beautiful thing in the world. Of course one is often tempted to such a decision in face of any remarkable work of art; but I believe that in this case absence and the sight of other marvels will not greatly weaken my present impression.

It is, or was, somewhat the fashion among would-be æsthetic people to sneer at the Washington Monument, to say that it is not a work of art at all, but merely a proof of mechanical ingenuity; to declare that it is remarkable only because it is big, and that to admire mere bigness is a sign of æsthetic barbarism. But people who talk like this have never looked at the monument or they have had no eyes wherewith to see it. Truly it is big; it is 555 feet in height and, I think, not any other structure in the world is so tall, except the Eiffel tower, which no one would affirm to be a remarkable work of art. And truly its size plays a very large part in determining its magnificent beauty. But no one who really comprehends architecture will be disturbed by this statement. Size is always a very potent factor in architectural beauty of the grander kinds—is æsthetically important here as it is not in other branches of art. A pyramid, a cathedral, a palace, a castle, implies grandeur of effect, and this we cannot have in architecture without grandeur of scale. It is the same with architecture as with trees, for instance. A little oak tree may, in one sense, be as beautiful as the biggest. But the bigger an oak tree is, if its proportions are fine, the more dignity and impressiveness it has, the more forcibly it speaks to the imagination, the more remarkable and potent is its beauty.

Moreover, the simpler a work of architecture is the more distinctly size contributes to its effect. An elaborate cathedral greatly reduced in scale might still be very beautiful, but not so a simple pyramid. An obelisk is as simple as a pyramid, and therefore the bigger it is, provided grace of outline is preserved, the more impressive it will be. When the Washington Monument was built to a height of 555 feet it was made five times more beautiful than had it been built, with the same lines to a

height of 155 feet. Indeed, the increase in beauty was proportionately much greater than this: it was incalculable in degree. There can be no real comparison between the impressiveness of those Egyptian obelisks which we are accustomed to think large and the impressiveness of this vast snowy giant on the banks of the Potomac. Of course an Egyptian obelisk consists of a single stone, and this one of a great multitude of small stones; but this fact does not impair its beauty, as would be the case were it as small as they. It is so vast that no one could be foolish enough to imagine it a monolith; therefore it does not deceive the imagination, as do, for instance, the pseudo-Greek columns of the Madeleine in Paris, which ought to have been monolithic, and are not.

The monument was forty years in building, and the design was greatly simplified when, after a long period of inaction, work was begun upon it for the second time in 1876. It is now a perfectly simple shaft, rising directly from a flat platform. The original idea was to have the shaft rise to a height of 600 feet from the centre of a great circular hall 100 feet in height and 250 feet in diameter, and surrounded by lofty colonnades.

No guide-book tells me who conceived the original scheme, or who was responsible for its alteration, and what guide-books do not tell no one else in Washington seems to know. But the second person concerned in the matter has surely given us a finer thing than his predecessor imagined. The proportions of the obelisk are now so perfect that one cannot help believing that 50 feet of additional height would have injured them without increasing majesty of effect, and the simplicity of the baseless shaft is infinitely preferable to one's mental picture of the original conception. An obelisk needs no base—its character, its distinctiveness, its reason for being resides in its bold, naked independence. This the Egyptians knew, although their knowledge has not been shared by most of the moderns who have re-erected Egyptian obelisks on occidental sites. And the bigger an obelisk is the less it needs a base—the more distinctly a base would detract from that expression of soaring self-sufficiency which makes its individuality, its singular impressiveness. The Washington Monument would be as greatly injured by an elaborate supporting structure as by a statue on its apex. The present platform should be encircled by balustrades and terraces at a distance from the shaft, but the shaft itself should remain for ever just as it is.

To stand beneath it and gaze upward along its limitless snowy sides means an impression of a peculiar sort which no other work of men's hands can give; and to see it from a distance means a vision of beauty, force and majesty, which makes us affirm that simplicity is indeed a more potent kind of beauty than the richest elaboration. Smaller, it would be merely handsomer; now it is magnificent. With less beautifully graceful proportions it would be merely big; now it is powerful beyond words. And its size and shape are incalculably enhanced by its colour. Such a shaft built of dark stone would be very imposing, but it might not be very beautiful. White is the only colour which could mean perfect beauty in a monument of this size; and white of just this quality—white which is not cold and hard and glittering, but soft and tender like the colour of new-fallen, uncrusted snow. Whether one sees it against a bright blue sky or against clouds almost the same as itself in tone, or against heavy curtains of leaden grey, its colour is always exactly right, making a splendid contrast to its background or a delightful harmony with it.

When one consents to look away from the monument and the dome and the ever present verdure of Washington to its domestic and governmental architecture, one's feelings are less simple. Now one admires, now one energetically protests, and occasionally one bitterly grieves.

As a whole the domestic architecture of the newer parts of the town is not unlike that of upper New York, on the west side. It is much less fantastic, unreasonable and heterogeneous than the domestic architecture of Chicago; yet very queer specimens of aberrant art frequently present themselves. As I had not visited the city before for a space of some ten years, I could judge pretty well how violently enterprising American architecture had become during this period. About ten years ago Mr. Richardson had recently completed four or five large residences, and they were pointed out to every stranger as marvels of originality—even of eccentricity. Both those who admired them and those who did not thought them extremely bold, extremely unconventional. To-day these houses are seldom pointed out, and when they are it is simply to say that the great Richardson built them. And to-day they look quiet, reserved, almost conventional, in comparison with many of the things which the past ten years have produced.

The "Morning Post" says:—A remarkable discovery has been made at Carrog, near Llangollen. While a number of workmen were carting stones from the bed of the river Dee they discovered the remains of an ancient church, which was washed down by a heavy flood three hundred years ago.

STAINED-GLASS.*

"TRUTH," someone has said, "never can be confirmed enough," and nowhere does this statement apply with greater force than in matters of art.

When a truth has once found acceptance the wonder is that there should be any temptation to depart from it, yet history shows that whenever art has flourished or declined its rise or fall has been the result of its adherence to, or departure from, the laws which govern it.

All the arts cluster around that of architecture as the source from which they derived their being. "Men built houses before carving them, and carved before painting them," says Viollet-le-Duc. Sculpture and painting are, therefore, but helpmeets of architecture, sustaining independent and harmonious relations each to each when justly balanced. We have so long lost sight of this truth and are so accustomed to regard sculpture and painting as independent arts, each sufficient unto itself, that it requires an effort to realise that in the beginning both arts were evolved as accessories to architecture, and that there was no sculpture nor painting except as decorative adjuncts.

The evolution of the stained-glass window may be traced step by step to this fountain-head of all the arts, for the stained window is only an offshoot of the earlier art of painting, which had at first only a decorative function. Painting at the very outset was of the nature of symbolic representation, and was one of the earliest arts in which the creative faculty of primitive man was brought into play. It was this symbolic art which the early Christians appropriated to their use, for various reasons. First, because of its suggestiveness and power of appealing to the imagination of the illiterate, who were to be instructed in the faith; second, because, while having a peculiar significance to the initiated, it guarded the mysteries of the brotherhood from hostile scrutiny; also because there was at that time a dislike of direct representation of Deity. These were the practical ends which religious symbolism was designed to serve. But, as the Church grew in wealth and power, it began to feel that one of the ways of glorifying God was in beautifying His temple; so beauty and utility conspired and caused to exist some of the sublimest creations the human mind could conceive. By degrees this symbolism grew into a more literal portrayal of Church history and tradition, so that the walls of Roman and Byzantine interiors were decorated with frescoes representing scriptural scenes, the apostles, saints and martyrs. These interiors, owing to the small window openings, were lighted for the sacred service by artificial means, tapestries often being hung over the windows. But when stained-glass made its appearance in the twelfth century, probably from some Oriental source, churchmen were quick to transfer their decorations from the opaque and poorly-lighted walls to the translucent surfaces of the windows.

In effecting this change, however, they did not lose sight of the fact that their window ornament, as well as their wall-decoration, was to be kept subordinate to and in harmony with the architectural surrounding. All antique work is distinguished by this strict adherence to decorative principles, which does not permit either sculptured or painted ornament to transcend certain limits.

Stained-glass design, particularly of the earlier Romanesque period, had generally the effect of tapestry. The figure and all natural forms, when used as *motifs*, were severely conventionalised and in one plane; consequently without perspective or chiaroscuro. We may be able to determine exactly what constitutes the essentials of good stained-glass, and what its proper treatment should be, by noting the properties of the antique art when at its best, and if we can rightly understand the cause of the decline of the stained window in the sixteenth century, we may save from a similar fate that of the nineteenth century.

The advent of the Gothic style, with its reduced wall-spaces and larger window-openings, was the opportunity of the glass-worker of the twelfth century. To fill these vast openings with some material which should at once exclude the weather and admit the light was his task, and as the antique glass could be made only in pieces of limited size, it became necessary to build up a mosaic of numerous pieces, joined by strips of lead, in order to make panes of area equal to the windows.

Throughout the Mediæval period this mosaic method was strictly adhered to. The artists recognised the limitations laid upon them by the nature of their material, their designs being mostly confined to the arrangement of pieces of coloured glass in geometrical and other fanciful patterns. They made no effort to conceal the unavoidable lead lines, but rather forced these to perform certain functions in the artistic as well as mechanical economy of their windows. But they refrained from attempting to make pictures out of them, and during this

* A paper read before the Minnesota Chapter American Institute of Architects by Mr. W. A. Hazel, and published in the *Inland Architect*, Chicago.

period of more than 300 years there is no instance of an attempt at realistic portraiture. The antique workman was content to get the most out of his material in the way of gorgeous colouring. Design was of secondary importance and restricted in range.

The peculiar virtues of Mediæval windows were due to the quality of the glass they had at hand. In its manufacture their knowledge as well as facilities were extremely meagre, and their small knowledge of chemistry gave them a very limited palette. But this handicap was itself the cause of much of the beauty of their raw material. Being obliged to make it in small pieces, they were necessarily forced to retain the mosaic process; this was well for the art. Then, too, their glass was heavy, of unequal thickness, full of bubbles, coarse-grained and of uneven texture. All these mechanical defects made the antique glass the ideal material for mosaic windows; they made it scintillating and luminous, full of deep, mysterious colourings, making thinness and monotony impossible. Such was the best estate of the glorious old Mediæval window, "casting a dim religious light," of which the poet sings.

Now, what was the cause of the decline? With the fifteenth century came the Renaissance, and with it the new form of art—oil-painting. Just at this juncture certain mechanical improvements were made in the fabrication of glass. Vitrifiable or enamel colours for glass-painting were also discovered, and a yellow stain made from silver. These conspired to overthrow the old art of mosaic. In the first place the improved method of glass manufacture produced a more mechanically perfect material. It gave larger panes, uniform in thickness, smoother in texture, and more homogeneous—i.e. more compact, without the air-bubbles which gave the gem-like effect. These changes alone meant loss of vitality in the material itself. It became thin, weak and monotonous. Then the invention of enamel colours led the artist to attempt the imitation of the effects of oil-painting. This was particularly harmful. The craftsman threw away his fine old glass, and took the new smooth material upon which he could paint, loading it with the opaque enamel and still further deadening the glass which had already lost its vitality.

Of course it proved impossible to make a realistic picture in glass. The hard lead lines bounding the different planes of the perspective destroyed all pictorial illusion, so, like the dog in the fable who saw his reflection in the water, the old artist dropped a choice morsel to seize a shadow, and—lost all. For three hundred years he had followed Truth. When he forsook her his art disappeared.

From the beginning of the sixteenth century to the middle of the nineteenth is a long leap, but during the interim the art left no record worth noting. There was the so-called revival in the eighteenth century, during which some restorations and repairs of old windows were made, and some new ones in imitation of the old. But it was not a revival in any true sense. A real revival is a reversion to principles and not a mere resurrection of old forms without the spirit which formerly animated them. No such revival occurred until the last quarter of the present century, when American artists inaugurated a new era in the history of stained-glass, and placed the art upon a plane it had never before occupied. Returning to the antique mosaic method, American artists have made glass equal in every respect to that of the olden time, with the added virtue of almost limitless range of colour, thereby furnishing an illustration of old principles taking root in new soil, springing into vigorous life and bearing fruit before unknown. We not only abandoned the use of paint, which deadened the lustre of the glass, but we reaffirmed the old truth—that stained-glass is an accessory art, an architectural adjunct, designed to enrich that of which it is but an integral part, the architectural unit.

Mr. Van Brunt, speaking of the effect upon architecture of our geographical isolation, says:—"We occupy a new country, having no inheritance of ruins, and no embarrassment of tradition; in matters of architecture we are absolutely free from historical prejudice," or—he might have added—historical example. This condition however was suddenly changed in 1876. In that year the Centennial Exhibition brought great numbers of European artists to America, and their work supplied the lack of example, not only with regard to architecture, but all the decorative arts as well. Our manufactures were given a needed stimulus, and then began that wave of æstheticism which swept over the country, and has not yet subsided.

In the centennial year two great men and two great opportunities met and shook hands. Henry Hodgson Richardson and John La Farge were the men. The building of Trinity Church and its decoration were the opportunities.

But for Mr. Richardson Trinity Church would have had no existence, and had Trinity Church not been built Mr. La Farge, one of the foremost living colourists, would not have been called upon to decorate it at a time when the air was full of these new influences, and he might have remained to the end of his days a painter of easel pictures only.

But Mr. Richardson having built the church and Mr. La

Farge having undertaken its decoration, it became evident that the "priceless glass" in vogue in Europe would prove inadequate for such an interior. So, spurred on by necessity, Mr. La Farge began making investigations and experiments in coloured glass, with results which revolutionised the process of glassmaking. Previous to this time we had gone so rapidly to the bad in the production of machine-made stuffs that we had about reached the point where the workman "pressed the button and the machine did the rest."

Now came the transformation. Manual dexterity, backed by intelligence, was substituted for senseless machinery. Improvement in the artistic quality of glass was at once manifest. The worthless stuff which had supplanted the antique material in its turn gave place to a new fabric having the same qualities possessed by the glass of the Mediæval craftsman. Material which had been previously discarded as imperfect and worthless by reason of accidents and miscalculations was found to have just the variety of tone and colour most desirable, so that the worst failure often included the greatest success. In the new we had rediscovered the old, and in opalescent glass contributed a purely American product to art.

Now the question which concerns us as artists, whether architects or glassworkers, is this. After having seen this rejuvenated art occupy the high place which La Farge gave it—ior he alone has held steadfastly to the fundamental decorative principle—shall we tempt the fate which blighted the art in the sixteenth century? We stand to-day as to the modern art in the same relation as did the fifteenth-century artist to the antique. The next step may be forward or backward; which shall it be?

There is no such thing as remaining stationary; that is contrary to the universal law; there must either be progress or retrogression, growth or decay.

Art can never realise absolute perfection, but it is on the road to it so long as it holds to rock-bed principles. The art of the ancient Greeks is proof that the highest excellence is attainable and maintainable only by the observance of this law. Without desiring to take a pessimistic view of the situation, I do not hesitate to say that, for stained-glass in particular and the decorative arts in general, I see "breakers ahead." The tendency to overstep the prescribed bounds of accessory arts is noticeable in some of our most prominent work, and the cause is not far to seek.

We produce our art, as we do everything else, on a large scale. Our art establishments are huge institutions. It is necessary to their maintenance that the public should buy. If it will not buy art we must sell what it wants, and if it doesn't see what it wants, all it has to do is to ask for it. And we have scriptural warrant that "those who ask shall receive."

We are inventive and admire a "clever" thing more than we do an artistic thing. Consequently our bump of inventiveness is abnormally developed. The man who produces the newest thing, or the biggest thing, or the most ingenious thing, is the artist *par excellence*—for the multitude. The multitude has the money, and must be gratified, if the artist has to violate every principle upon which his art is based. We have the national fault of letting our cleverness carry us beyond legitimate bounds, partly in mere exuberance of cleverness, partly for mere display, or a desire to win vulgar applause by being thought more clever than our fellows. It requires considerable moral stamina to stop short when the artistic conscience says "thus far and no further."

The greatest sinners in this respect are those who ought to and do know better, but cannot withstand the craving for popular favour. To be an artist and hold with one's conscience one must be pecuniarily independent and indifferent to popularity, or he is liable to go begging, both for dollars and fame. As an illustration of this tendency one instance will suffice:—One of the most ambitious, recent stained-glass windows, and one which is often cited as a "splendid work of art," was made by a well-known firm of reputed artists. In this window is reproduced Doré's picture, *Christ leaving the Praetorium*, in which, in my opinion, every law which should govern true decorative work is transgressed, not through ignorance, but knowingly and wilfully, for the sake of dollars and the applause of the multitude.

I am aware that the criticism I shall make involves a point debated among artists respecting the limit to which naturalistic treatment in glass may be successfully carried. It seems to me that the question should be, not what may or may not be successfully done, but what ought or ought not to be done, whether successfully or not. In stained-glass windows pictures should be rigidly excluded, because upon principle they are wrong. The aim of a picture is to create an illusion by a simulation of nature. In decorative work any treatment which admits a doubt as to the actuality of the thing decorated is wrong. A picture is an entity. Its values are intact within its own extent, and it is unrelated to anything beyond. But designs which are suitable for wall-decorations or windows should make the surfaces of both self-evident. A painting which transmutes a solid wall into thin air is wrong in prin-

ciple; its proper function is to beautify the wall, but not to make it a less substantial fact. The plane of the window is a continuation of the wall plane; therefore to make a picture out of a window is wrong, because it resolves the window into other planes than that of the wall in which it lies, and for the stronger reason that it sets itself up as an independent entity when it should be but an integral part of an architectural unit. Consequently the transference of a large canvas painting to a window, as in the *Christ leaving the Prætorium*, banishes the window plane and leaves in its place a vista of palaces and multitudes and all the illusion of sky and air which perspective and chiaroscuro can accomplish. This is as obviously wrong as the *New Jerusalem* in Trinity Church and the Ames memorial at North Eaton are right. The last conform to decorative principles; the first contravenes them.

From this it may be seen that the signs are not lacking which tell that the newly-recovered art is yielding to hurtful tendencies; is starting or about to start down-hill again. It is the architects to whom we must look to check it by their influence. The public must be educated to the point of ability to know good from bad, or there is no future for architecture or its dependent arts. People should be taught that there is an absolute right and wrong in the realm of æsthetics; they must learn that art is not governed by caprice or arbitrary formulæ, but by well-known laws, easily ascertained if one will but take the trouble.

In the hurry and impatience of this electric age we cannot hope, perhaps, ever to command the leisure of the ancient Greeks for the cultivation of the arts; neither will we come under such a dominating influence as were the Florentines of the fifteenth century, when "every new structure became a school of the eye and the taste." But it is not impossible for us to reach that condition when, by education, the judgment of the people will have become so good that artists will not hesitate to appeal to it. The assurance that merit can safely appeal to such a tribunal will stimulate each to his best endeavour. The artist and the public will react each upon the other; the artist educating the public by constantly keeping before it the highest ideals of his inspiration; he, in his turn, kept to the true path by the exactions of an educated and fastidious public, quick to recognise the powers exerted in its behalf, and to commend and reward if also to criticise; each capable of appealing or being appealed to, confident of intelligent and sympathetic appreciation.

HYDRAULIC LIFTS.

(Concluded from page 377.)

IN one form of suspended low-pressure lift, shown by diagram, the cylinder is stood vertically, and the water is introduced above and below the piston, by which means nearly an equal power is exerted throughout the entire stroke; as the pressure due to the height of water above the piston, and the sucking action of the column of water beneath the piston combined, would be the same in any part of the stroke if it were not for the small area of the piston rod, and this slight loss of power, as the piston descends, is generally more than compensated for by the weight of the ropes suspending the cage, passing over the top sheave from the cage to the opposite side; if it were necessary by apportioning the size of the rod and the weight of the ropes, an exactly equal power could be obtained throughout the whole travel of the lift. This is a very good arrangement, and was introduced into use in this country some years since by the American Elevator Company, but, strange to say, this exact form was patented in this country by Harriott and Strode in 1802; the specification is not now in print, but it can be seen at the Patent Office Library. It is most carefully and accurately drawn, and describes this method of using a vertical cylinder. The author merely mentions this as showing how curiously before its time this invention was.

An ingenious arrangement also was illustrated for balancing the weight of the ram and cage of a direct-acting lift, and at the same time equalising the power throughout the travel of the lift and thus reduce the quantity of pressure water used. The displacement ram is weighted to nearly counterbalance the weight of the lift ram and cage as in the Ellington balance, but the actuating ram acts on the displacement ram through chains or ropes which coil on to cam-shaped barrels or fuses, so that the downward pull on the displacement ram increases as it descends, thus increasing the pressure as the lift ram ascends, obviating any loss of power by protrusion. The balance was patented by Mr. Archer, and is manufactured by Messrs. Richardson & Co., Limited, and is an example showing the endeavour lift manufacturers are making to reduce the quantity of water used by their lifts to a minimum.

Mr. Carey directed attention to a new system of hydraulic lifts and cranes, by which the quantity of water used is automatically approximated to the load raised. He is quite aware that multiple power machines have been made for a great number of years, that is, multiplying cylinders or jiggers, and

also direct-acting lifts with more than one ram, a light load being raised by admitting water to one ram, a heavier load by admitting it to two, and so on. In some instances a ram and piston is used when the pressure water is admitted to both sides of the piston, the annular space round the ram is in equilibrium, and the area of the ram only is effective when the pressure-water is admitted to the back of the piston, and when the water from the annular space round the ram is open to exhaust the whole area of the piston is used and the maximum load may be lifted. In other arrangements there are two rams, the smaller one working inside the larger, the bottom of the large ram being open. When a light load is to be raised the large ram is held back by powerful claws or clips attached to the cylinder; when heavy loads are to be raised the large ram is released and the two move as one. In this arrangement the combined areas of the two rams are not used, but the area of the large ram has to be sufficient of itself to raise the maximum load. All these methods, however, are more or less clumsy, and must take time to alter from one power to another. Therefore, on account of the time and trouble involved, the alteration is only made when a great number of light or heavy loads have to be raised in succession. The arrangement that looks most promising at first sight is that in which the power is increased by simply pulling the hand rope further on, the water being admitted to two rams, or the exhaust made from before the piston as before described. But there are difficulties in this; for instance, if a heavy load has been raised and the lift stopped, the rope only having been moved to the point at which it will stop when the heavy load is in the cage, when the load or part of the load is taken out the lift starts on again until the rope is moved still further. This, of course, is a serious fault; it may perhaps be provided against, but the fact of leaving the attendant the option whether he will go on to the first or second power is not satisfactory, as, in order to save trouble, he will generally elect to go on to the second or largest power, although the machine was intended to save water and not trouble. Again, with this arrangement there cannot well be more than two powers, whereas, to be a really economical machine, there should at least be three powers or grades, if not four or even more, and the discretion as to which grade should be used should not be left to the person working the lift or crane, but should be automatically selected.

Successful attempts have been made to prevent the valve from opening to the second power or grade until a certain pressure has been obtained in the cylinder, indicating that the maximum lifting power of the first grade was nearly reached. The movement of the controlling rope or lever should be always the same, and the speed should be under control as well as the stopping and starting in either direction. All these conditions, the author claims, are met and successfully carried out in his system, which he will now explain.

A lift which has now been working for some months, showing a great saving over the usual form in the water used, is fitted with two jiggers. One is practically the ordinary description, but the other is a four-power machine. They are both constructed alike, so far as the multiplying power goes—that is to say, they both multiply four to one, and are therefore both the same stroke. The ropes suspending the cage can be readily shifted from one machine to the other. One machine was first run for some time and then the other, and the water used by the machines compared, and the actual saving shown in such a way that it is impossible to question the saving effected:—

ORDINARY JIGGER.

Days at work.	Trips made.	Passengers carried.	Gals. of Water used.	Gals. per day.
275	54,493	103,308	393,400	1430'5
Gals. per trip.	Gals. per Pass.	Gals. used in 300 days.	Cost from Power Co.	
7'22	3'8	429,150		£83 12 0

NEW JIGGERS.

Days at work.	Trips made.	Passengers carried.	Gals. of Water used.	Gals. per day.
134	27,291	54,849	80,700	602'2
Gals. per trip.	Gals. per Pass.	Gals. used in 300 days.	Cost from Power Co.	
2'95	1'47	180,660		£46 0 0

SAVING EFFECTED BY NEW JIGGER.

Gals. per day.	Gals. per trip.	Gals. per Pass.	Gals. used in 300 days.	Cost from Power Company.
£28'3	4'27	2'33	248,490	£37 12 0

The multiple power jigger has one ram $3\frac{1}{2}$ diameter, pressed downwards by the water to raise the cage; this is assisted by weights added to cross-heads which are sufficient without assistance from the pressure water to raise the cage with attendant and one passenger. There are three small rams fixed at the bottom which oppose the power of the large ram. The centre one of the three is 2-inch diameter, and works through a stuffing-box into the interior of the large ram; the other two outside rams are $1\frac{1}{2}$ diameter each, and work into the two sides or tension rods, which are made of tubes to form cylinders for them; the two rams always act together as one. The action is as follows:—For the first or lighter power the power-setting valve is so placed that the exhaust is made from all the cylinders or rams; the load is raised by the weight on cross-head alone. For the second power the pressure water is

admitted into all the cylinders, the large ram is then opposed by the three small rams, but as the area of the large ram exceeds that of the three small ones increased lifting power is obtained. For the third power, the centre ram is opened to exhaust, the large ram then only has the two outside rams to oppose it. The fourth power has all the three bottom rams open to exhaust, when the full power of the large ram, assisted by the weights, can be used to raise the maximum load. To lower the empty cage, pressure water is admitted to the centre ram, all the others being open to exhaust; the weight of the cross-head, &c., is raised by this means; if a heavy load is in the cage no pressure water need be admitted, the weight in the cage raising the extra balance weight.

The principle of working the valves is very simple, and the details are not complicated, there being two valves—the starting valve and the distributing or power-setting valve. When it is wished to start the lift up, the controlling or starting rope is pulled down to the limit of its movement, the starting valve being thus opened in the usual way. At the same time, the pressure water is admitted to the back of a small piston, which actuates the distributing valve which commences to travel forward. If there is a light load in the cage, and the lift commences to move, the movement actuates a pawl, which is immediately dropped, and the further movement of the valve is arrested, the lift making the ascent on the first or smallest power. If the first power or grade is not sufficient to raise the load, the distributing valve continues to move from power to power until the right power is found, when the lift commencing to move the pawl drops and arrests the further movement of the valve. There are various ways in which the pawl can be actuated. The one now in use is a small ordinary governor driven by a small wire rope attached to the moving head of the jigger. When the lift commences to move at the required speed, the balls fly out and lower the pawl; when the lift is stopped the pawl is raised again by the weight of the balls, the distributing valve always returning to its first or normal position directly the lift is stopped. The stopping of the lift, either on its ascent or descent, depends upon the starting valve in the usual manner, and has nothing whatever to do with the position of the distributing or power-setting valve; and therefore the ordinary automatic stops on the starting rope, tapped by the movement of the cage, act as usual at the top and bottom of the travel to prevent overrunning. Instead of the governor a small wheel was caused to revolve when the lift started, the pawl resting on the top of the wheel by a vertical pendulum stop, which was moved to one side or the other when the wheel revolved, and thus dropped the pawl to arrest the further movement of the power-setting valve. This was found very efficient in practice; but the neatest and most reliable way of actuating the pawl is by a small loose-fitting piston, causing the pawl to drop when the water commences to flow, and raising it again when it ceases flowing. It would be tedious to describe in detail the various means of arresting the further movement of the power-setting valve, when the lift commences to move; but by doing this the great advantage is obtained that, however much the actual friction of the machine may vary, when the grade or power is reached that will do the work, then, and not until then, is the valve stopped from going on to the further powers. Therefore, when the jigger is repacked, and there is probably much more friction than there will be a few days afterwards when the packing has become free and easy, the working of the machine is not interfered with, although for a short time rather more water may be used to overcome the extra friction. It will at once be seen that this is a much more economical arrangement than any that could be devised dependent upon the varying pressures created by the load in the cylinder, as in that case a larger margin or lap must be allowed to each power. That is to say, a large power must be started before arriving at the full power of the grade next below. If made to act too closely, constant readjustment would be required to suit the varying friction of the machine. With the arrangement described, each grade will work up to within a few pounds of its maximum power before the next grade is started, hence the great economy of water obtained.

There is another feature of importance to which the author directed attention, and that is the extra safety obtained by the multiplication of the cylinders. In most cases they are smaller, and therefore less likely to burst than the cylinders of ordinary lifts. On the other hand, the bursting of any one would not leave the cage to descend uncontrolled. The second, and perhaps more important point is, that after the lift has once started no further power can be obtained. There is rarely, therefore, much spare power beyond that necessary to raise the load in the cage; consequently, should a person be caught between the floor of the cage and any part of the enclosure, instead of serious injury to life or limb, the probability is that the lift would simply stop. He had continually tested this by catching hold of some protruding part of the enclosure, and bringing the lift to a standstill; and as, perhaps, one of the most frequent sources of danger is the jamming of a limb or the body between the cage and the enclosure or floor, anything

that tends to mitigate this is of value, and may fairly be said to be a point of the utmost importance.

The arrangement, it is clear, can be adopted for direct-acting lifts with Ellington or other balancing cylinders. A sketch showed a balancing cylinder with three actuating rams, the combined area being equal to the single ram usually provided, and another showed a suitable starting valve and power-setting valve. On the starting valve being moved back to make the ascent, it admits the pressure water through a pipe to the power-setting valve, and at the same time opens the exhaust from the back of the small piston which actuates this valve. The pressure water at once acts on the centre actuating ram, and if this has power enough to raise the lift, the movement of the power-setting valve is stopped by a pawl, but should this ram be insufficient, the piston with the valve moves back slowly, first covering the port leading to the centre ram and then uncovering the port leading to the two outside rams, which act together. If the lift then moves, the further movement is arrested by the pawl; but should these two rams not be sufficient, then the valve moves on still further, opening the two ports leading to all three rams, giving the maximum power. When the lift is stopped, the starting valve is brought into the central position shown, and the pressure water is free to act through the small port and pipe on the back of the piston, thus driving the power-setting valve home to its normal or first position. In lowering, the valve remains in this position, the exhaust water from the two outside rams escaping through the retaining valve shown, or a separate pipe with a retaining valve may be employed, so that the water need only pass through the starting valve in lowering. In cases where the balancing cylinder already exists, two or more small rams can be added, attached to the moving cross-head, and acting in the reverse direction to the existing actuating ram. If the pressure water is admitted into all three rams, the two small rams will oppose the large ram; but as their combined area should only be about two-thirds of the area of the large ram, the water is forced out of the cylinders and finds its way into the large cylinder, therefore only about one-third of the water is used. If the pressure water is admitted to only one of the opposing rams, two-thirds of the water will be used, and if it is admitted only to the large ram, the full power is obtained, and the quantity of water used is the same as before the alteration. It is probable that instead of two rams four would have to be used, two always acting together on opposite sides of the cross-head, so as to give a central strain. If the balancing cylinder is overweighted, so as to raise the empty cage and the attendant without the use of pressure water at all, the lift may be made to lower loads over a certain weight, and store up the energy to bring up the empty cage with the attendant only in it, ready to lower another load. Or the stored up energy may be used to assist in raising the next load, therefore using a commensurate less amount of water. In some of the large stores in London the passenger-lifts are in constant requisition, the cage being nearly always full of passengers both up and down. In cases of this sort it would be easy to so design the machine that very little pressure water would be used. To accomplish this end it would only be necessary to have either opposing rams or pistons, and the power-setting valve arranged to distribute the water to the right cylinders to drive up or down as might be requisite to deal with the load happening to be in the cage at the time. It is obvious that a ram might be employed instead of over-weighting the balancing cylinder, but this would involve returning the water into the mains, and this is objected to where the water is obtained from the Hydraulic Power Company's mains. The arrangement applies to suspended lifts with jiggers, as well as to direct-acting lifts with balancing cylinders.

The arrangements of stopping the further movement of the power-setting valve previously described are perfectly good for a lift, but quite unsuitable for a crane, the conditions of working being altogether different. When a lift is started no further load is expected to be taken into the cage unless it is first stopped, but when a crane commences to raise a load resting on the ground, it does not immediately have to raise the whole weight, but the weight increases as it is raised clear of the ground. Besides this, the loose chain has to be taken up before commencing to raise the load at all, therefore the same arrangement of stopping the further movement of the power-setting valve immediately the machine begins to move is impracticable for cranes. It is, therefore, proposed to interpose in front of the power-setting valve a graduated or stepped stop, moved up or down according to the load on the lifting-chain. When there is no load or only a light load on the chain, the first grade is interposed to prevent further movement of the valve, but as the load increases the stop is moved until it allows the valve to advance to the second or third power, and so on. The stop may be actuated by the tail end, or what is usually the fixed end of the chain, after having passed over the multiplying sheaves on the jigger or multiplying cylinder, or by arranging one of the leading sheaves, over which it passes on a spring or weighted lever, so that it is depressed more and more

as the weight increases on the chain. The same action takes place when the goods are lowered, but in the reverse way. With very little extra cost the crane may be made to lower goods over a certain weight, and return the empty chain ready to lower again without using any water at all, except the little sometimes necessary to raise the load clear of the floor before swinging it clear of the loophole. As in a great many cases as much weight has to be lowered by the crane as had previously been raised, this arrangement alone should save nearly half the pressure water used by a crane on the present system, which uses as much water to raise the empty chain as it would for the full load. The same remark applies with equal force to warehouse lifts, and the same advantage is claimed, that in lowering goods over a certain weight sufficient energy is stored up to return the empty cage without the use of pressure water at all. The energy is stored by raising a weight and not by returning the water to the accumulator or other source.

The next point of interest is the cost of production or manufacture. It is true there are several more parts in a multiple-power jigger than in an ordinary single power one, and there are two valves instead of one. On the other hand, there is the advantage that the parts can all be smaller, and much may be saved by using smaller tools, and in the facility with which the smaller parts can be handled in the factory. Assuming a three power machine, made with three solid rams, the total area of the three rams would only be equal to the area of the one ram in the ordinary machine. The total weight of the rams is, therefore, the same in both cases, but it is granted there is a little more cost in turning the three rams over the one large one. But the small cylinders can be made of wrought-iron or steel tubes, and the three will not weigh more than, if as much as, the one large one, if made of the same material. The three small ones, however, will be quite as cheap, if not cheaper, than the one large one; they are certainly much easier to manipulate; the stuffing-boxes can be small castings screwed separately on to each cylinder or tube; the parts are all, therefore, much reduced in size. But the great advantage would be that these machines could be made and stocked, so that the sizes of the rams need not be different for every load the jigger is constructed to carry. The same machine would be used whether the lift raised a maximum load of, say, 5 or 15 cwt., or any intermediate load. It would not, therefore, be necessary to make a special machine for each job, as is the present practice. The length of stroke would merely be a question of cutting off the rams and tubes to the requisite lengths. All parts could be made to gauge and interchangeable, and it is anticipated that, by making a few special machine tools, and by reducing the manufacture to the multiplication of exactly similar parts, the cost would be little if any more than the present machine, which can rarely be made in duplicate. There would be a very great advantage in being able to take the machine out of stock, and start fixing it almost directly on receipt of an order, instead of having to wait while the machine was being prepared.

There are several inventions which have for their object the saving of water, or to some extent the using the pressure water commensurately with the load lifted, and some of these arrangements are more or less automatic in their action. Mr. John Hastie, in his specification, No. 3,561—1876, appears to be the first to propose anything in this way. He adopts the principle of opening a valve kept closed by a spring when the pressure in the lift cylinder reaches a certain point. Mr. Robert Middleton, of Leeds, comes next, he also adopting the principle of actuating the valves by the varying pressure created in the lift cylinder by the various loads or weights to be raised. Then comes Mr. Thorpe, of the American Elevator Company, who likewise relies upon the varying pressures in the cylinder. There are also others who have worked in this direction, but they either rely on the varying pressure or on moving the valve further by the hand rope when larger power is required. Most of these arrangements would be effected by the varying friction of the pistons moving the valves, or the friction of the machine itself, and therefore cannot be made to work up to close upon the extreme limit of the power of the several grades, but a large margin of power has to be allowed, and for this reason the arrangements cannot be as economical as they otherwise would be.

THE ROYAL SCOTTISH WATER-COLOUR SOCIETY'S EXHIBITION.

FOUNDED in 1878, the Royal Scottish Society of Painters in Water-Colours takes this year a new forward step. For the first time in its history it comes, the *Scotsman* says, to Edinburgh from Glasgow, where its exhibitions have hitherto been held, and contact with the life of the capital, it is hoped, may do the Society good in making its aims more widely known, and in leading the art-loving people in the east of Scotland to take an interest in it. Its exhibition this year is an open one—that is to say, it is not confined to members only, but has been made free to all water-colour artists whose works

reached the necessary standard of merit, and it opens its doors in Edinburgh with the prestige attaching to so gracious a mark of royal favour as it has recently experienced in the knighting of its president, Sir Francis Powell, who has so long and worthily presided over its deliberations. Should the present experiment prove successful, the exhibitions in future will in all probability be held alternately in Edinburgh and Glasgow. Therefore, although the days are fine and the light is long, and people are tempted at this season to be more out of doors than in, it may be hoped that the Water-Colour Society will find a warm welcome in Edinburgh, and that sufficient encouragement will be given to it to warrant the Council in arranging for a return visit. The exhibition is being held in the Mound Galleries, which, with their cool draperies and artistic decorations, are hardly recognisable. Two of the rooms, the first and fourth, are done in old gold of a soft tint, the other two in a particularly pleasing red, which forms an admirable background to the pictures. The upper spaces of the walls are covered with paper in two shades of brown, with a dividing blue band; the floor is laid with a peacock blue carpet, and at the archways are hung light lawn curtains—each alternating set having a delicate green tint. This part of the work has, we believe, been superintended chiefly by Mr. A. K. Brown, A.R.S.A., who, with his assistants, have shown how extremely pleasing decorative effects can be secured with the most simple materials, if rightly used. Statuary has been introduced into the quietly-lighted recesses under the archways, and palms placed at appropriate points give a further summer-like character to the rooms. It was worth while for the Society to come to Edinburgh to show some of the old stagers how these galleries, which lend themselves so readily to be decorated, can be simply and yet effectively treated. Doubtless it will spur on the S.A. Society in October to still further efforts in the same direction, and may even give a hint to the Royal Scottish Academy for its exhibition next February. Even the finest jewels are often improved in appearance by an artistic setting. The exhibition of drawings is admirable. It far excels in merit any of the exhibitions of water-colours this season in London. There are eighty-four members of the Society, and of these sixty-one exhibit. Four hundred and fifty-eight drawings have been hung. These include the work of the best of our water-colour artists in Scotland, and, by invitation, a number of well-known Englishmen exhibit, though nothing very grand has come across the border. The south country men, such as H. Clarence Whaite, the president of the Cambrian Society; Mr. Ernest A. Waterlow, Mr. Walter Langley, Mr. J. H. Henshell and Mr. Colin B. Phillip send representative work, though their drawings are not of outstanding merit. The fact is that though England was the original home of water-colour art, not a few of the Scottish artists have long since outshone their English competitors in the same medium.

On the eve of the opening of the exhibition the members entertained to dinner in the Balmoral Hotel their president, Sir Francis Powell, in recognition of the knighthood which Her Majesty has been pleased to confer upon him. Mr. M'Taggart, R.S.A., the vice-president, occupied the chair.

The Chairman, after the health of the Queen had been duly honoured, proposed "Sir Francis Powell." They had often felt individually and as a Society very much indebted to him. They had all appreciated his unceasing energy for the good of the Water-Colour Society. If Sir Francis Powell was not an actual originator of the Society, he was amongst the very first to favour it, and certainly he was the strongest in assisting them to put it into shape and to carry it forward. He remembered the first exhibition of the Society sixteen years ago, and the success of that exhibition and the success of the Society since had been largely owing to Sir Francis Powell. It had not been all smooth sailing for the Society during that time. Now and then they had had their successes; but they had also had considerable disappointments, and through them all their President, enthusiastic and strong and helpful and full of resource, had sustained and supported and encouraged their efforts. The position they now occupied was largely owing to the exertions of Sir Francis Powell. He had sent many beautiful contributions to the exhibition; they knew his enthusiasm for that branch of art, and his amiable and attractive personality and admirable qualities had kept the Society together, and had enabled them to keep their faces to the front all these years. They had all done their best, no doubt, for the Water-Colour Society, and on that account they appreciated all the more the exertions of their President. Now that the Society had been honoured by the Queen conferring on its President the rank of knighthood, it well became them to drink their President's health, and to wish him long life to enjoy the honour which had been conferred upon him, and more energy to forward anew the interests of the charming art which they all practised.

Sir Francis Powell felt, he said, deeply moved by the many tokens of regard he had received and by their kind words of congratulation. One of the greatest personal pleasures he felt in connection with the honour that had been done to their Society was the many evidences of friendship and of kindness

he had received on this occasion. He had received many letters of kindness from the highest of the land, and he might tell them even little village children had sent him their tiny notes expressing their delight at the honour which had been done to him, and these notes had been the first that he had replied to. It was to him a great delight that this honour had come to their Society at the time when they had such a charming exhibition as was open now in the Edinburgh galleries. It was another pleasure to feel that their members had come forward to render the present really a remarkable exhibition. Mr. McTaggart had recalled to his mind the first exhibition they held in West Nile Street. The room was small, and, comparatively speaking, they had few pictures. Let them consider what they were now. He thought it did the Society honour that in spite of great obstacles they had been able to produce an exhibition like that of the present year. It showed what advance they had made, and how perseverance and determination would in the end bring success. If they would only be enthusiastic themselves and full of determination, the Society would advance still further, and become the head and front of water-colour art in the whole country. It was in their power to do it. It was the enthusiasm of every one that produced a good exhibition. Let them feel themselves a united body. Do not let their power be frittered away or divided by party feeling or anything of that kind. Let them be animated by the unanimous feeling to advance their art, and they would do yeoman service for the Society to which they belonged. He knew quite well they would do that, and such being the case, he had no doubts for the future of the Society. It would prosper in spite of all obstacles; it would grow if that feeling he had referred to bound them together.

Mr. John Smart, R.S.A., in proposing "Success to the Water-Colour Exhibition," said the Society never had a better. It was one which, as members, they might feel proud of, and which he trusted the public would esteem and heartily support. It was the first time they had been able to hold an exhibition in Edinburgh. He saw no reason why these exhibitions should not henceforth be held alternately in Edinburgh and Glasgow. It rested with the Edinburgh public to say whether that should be so or not. He was sorry to say that in Edinburgh of late years there had not been so much enthusiasm in regard to art and art exhibitions as he could remember in former years. He hoped a stronger and a deeper interest in art would be revived, and that on this occasion it would be manifested towards the Water-Colour Society. He heartily agreed with all that had been said of their president. Sir Francis Powell was an Englishman of a type they should be glad to see more of in Scotland, but the fact was that he had been so long in Scotland that he had almost become a Scotsman.

Mr. James Paterson, in proposing "The health of the Vice-President, Mr. McTaggart," said they were all proud of Mr. McTaggart. They had drank the health of their worthy President, and had heralded him as an Englishman in Scotland. Mr. McTaggart, they could all say, was a Scotsman who they were glad had not gone to England. This tendency to excessive centralisation of artists which had tempted so many good men from Scotland to take up their abode in the South, required a firm stand to be made against it; and Mr. McTaggart, he thought, deserved credit for resisting the temptation which undoubtedly a man of his unique talent had experienced, to go away to what perhaps would have been a wider field, and for remaining true to the country in which he was born and the art of which he so highly adorned.

EXCAVATIONS AT ARGOS.

IN the following letter to the Hon. Seth Low, president of the Archaeological Institute of America, dating from Heraion of Argos, Mr. Charles Waldstein gives a report of the excavations at Argos, which have been conducted during the present spring by the representatives of the American school at Athens:—

There is so much to say about our excavations this year that I hardly know where to begin. But I feel that before all I wish to give due recognition to the efficient help which several members of the school gave to our work of excavation. Mr. H. S. Washington, who, as you are aware, has for several years past carried on successful excavations at Plotheia, Plataea and Phlius, at my request came from Leipsic and remained at the Heraion from the beginning to the end of our work, taking charge during my absence, and assisting me throughout in the most efficient manner. Messrs. Lythgoe and Richard Norton, both of Harvard College, were also active during the whole of the campaign at the Heraion, each taking charge of large gangs of men, while Mr. Meader, of the Michigan University, did similar work at the Heraion, interrupted only by the week during which he had charge of the excavations at Sparta.

Owing to the kindness of the prime minister, M. Tricoupis, we were provided with three large tents from the Government stores, and were thus encamped on the hill immediately over-

looking our excavations. The plan of camping out has in every way proved a great addition to comfort, and has enabled us to keep more constant watch over the large body of men whom we employed. Our staff rose to 230 men with thirty-nine carts, and, though much still remains to be done, I believe this season's campaign has pushed the whole task much nearer to completion.

Our good fortune in every direction was beyond my expectations and even my hopes. We first completed the excavations of the earliest Homeric temple, clearing the whole platform, the cyclopean supporting wall of which had always been visible. Immediately below the surface we generally came upon masses of *poros* stone split into small fragments by the heat of the conflagration (which, as you know, took place in 423 B.C., owing to the negligence of a priestess). Below this we came upon a continuous burnt layer of charred wood and other materials, with fragments of pottery and melted bronze fused into one mass, and below this again we frequently came upon whole nests or pockets of pottery in comparatively good state of preservation, of seals, of objects in bronze and other materials which, I believe, will prove of the greatest interest and importance, inasmuch as we may be able to show that these objects antedate the construction of the temple, which again is undoubtedly of the Homeric period. Now, the relation which these finds hold to those of Mycenae, Tiryns and Hissarlik will, I trust, finally close the controversy concerning the date assigned by Schliemann and his followers and by Mr. Flinders Petrie to the Mycenaean works, by giving definite evidence in favour of their early ascription.

We have also cleared away the whole hillside between the first and the second temple, below the cyclopean supporting wall, down to the native rock, and besides the interesting stoa, the steps of which we discovered last year, and the whole of which, with portions of columns *in situ*, is now cleared, we have found interesting buildings connected with baths and water-supply at the west end of the stoa, while to the east three buildings of a later Hellenic period have been laid bare in comparatively excellent preservation and of great interest. Above these and immediately below the cyclopean wall there are remains of rude walls, beyond a doubt belonging to the early houses which I believe to have been the dwellings for the priestesses of Hera in the earliest times.

We have excavated the ground all about the south side of the foundation walls of the second temple (which was built about 420 B.C.), and have begun at the foot of the hill on the south below the stairs we found last year to clear away the earth to the native rock. But at the south-west slope we came upon a new building of exquisite masonry with a considerable portion of the walls standing, on the destination of which I do not now venture to express myself. Immediately in front of these walls at a depth of about 4 feet we found large portions of all the parts of the entablature of the building itself, massed together, and, to our great joy, we discovered the manifest traces of colour upon cornices, triglyphs, metopes and other portions of the Doric order, which will now furnish undoubted evidence with regard to the disputed point of Greek polychrome architecture. We also dug extensively at the south-east corner below the second temple.

Of the different single works of art discovered during these excavations I can hardly give you an adequate idea. I can only say that we filled sixty-three baskets with smaller objects, while there are a large number of marble works and fragments, and that these objects range in date from the earliest pre-Homeric works through all stages of Greek art down to the Roman period. Besides the large mass of important vases there are a great number of terra-cotta figures, among them a complete series of heads of Hera from the earliest date through the best fifth-century art. There are a number of engraved stones and seals, some probably manifesting an hitherto unknown form of early indigenous art, while others are an importation of Phœnician and Egyptian ware. There are also objects in ivory, amber, bronze, lead and other materials, all of the greatest interest.

Finally, we have found three marble heads and portions of the sculptures from the pediments, as well as the metopes which must be ascribed to Polyclitan art. We have found four inscriptions, and tiles mentioning the names of the architects of two of the buildings.

You can well understand how impossible it is for me to give you any detailed account of so rich a find at this moment. We have been hard at work excavating from six in the morning till six in the evening, and then had barely time to arrange our finds and write the necessary notes before going to sleep. Most of the objects hardly have the dirt removed from them. But they are carefully arranged according to the place in which they have been found, and are now being brought to Athens, where they will be locked up in a separate room until early next winter, when I can go to Athens and begin the task of cleaning, arranging and describing so great a treasure. But I hope before then to give a fuller account of our excavations in the next number of our "Journal of Archaeology."

At Sparta, too, we have been very successful. I resumed the excavations of the circular buildings mentioned by Pausanias, which I discovered last year, and left Mr. Meader in charge of the work, who has successfully carried it to a close. The whole building is now cleared, much more of it remaining than I dared hope last year. I venture to believe that it will prove the most interesting building of this date in Greece.

Besides later Roman inscriptions, Mr. Meader found a *boustrophedon* inscription in the building, which well corresponds to the early date which Pausanias ascribes to it. At a village called Choutzopodi (near the ancient Oinoe) we also excavated, Mr. Patton finishing the work. So much for to-day.

I am writing under difficulties and have hardly been able to collect myself after the continuous excitement of our work; for there has hardly been a day, nay, an hour, in which some interesting object has not been brought to light. But I do not wish to keep you, or the friends of the School of Archaeology and the Institute interested in this work, longer than I can help from sharing to some degree the delight of our good fortune.

BRADFORD ANTIQUARIAN SOCIETY.

THE members lately made a visit to Otley, Weston Hall and Leathley. Upon their arrival at Otley they went at once to the church. Here they were met by Mr. C. J. Newstead, who kindly acted as cicerone, and gave a sketch of the history of the church. There was a sacred edifice here in Saxon times, but none of it was remaining. In the chancel and in the north porch there were specimens of Norman work. The Perpendicular east window had taken the place of three Norman windows with round heads. The church was in the form of a Latin cross, and the aisles had been added some time after the rest of the buildings had been erected. The flat ceiling, and the gallery had been removed in 1854. Mr. Fison, who had been a great benefactor to the church, had given a rood-screen, and opened out a window in the tower. Mr. Newstead then went over the numerous monuments, commencing with the altar-tomb of Lord and Lady Fairfax, grandparents of the great Parliamentary general, and mentioning those of Vavasours, Fawkes and others. A beautiful decorated one was to Walter Fawkes, the patron of Turner. The party then drove to Weston, passing to the left the site of the Archbishop of York's Palace, which defended the bridge against the Scotch. The drive to Weston was most charming, the road leading down a fine avenue of elms to the front of the hall, the older portion of which is in the time of Henry VIII., one of the rooms having fine heraldic figures of dragons, dogs, double roses, signifying the union of the Houses York and Lancaster, portcullis, *fleur-de-lis*, &c., on the ceiling. Colonel Dawson met the antiquaries at the garden gate, and took them through the conservatories and the banqueting-hall in the grounds. Mr. George Hepworth took photographs of the hall, and Mr. John Sowden sketched the Fairfax tomb in Otley Church. The Dawson pew in Weston Church contains a stone monument and inscription saying that Sir W. Stopham was buried in the vault below in the thirteenth century. By kind permission of Mr. Fawkes the party drove through the woods and park of Farnley to Leathley, where the rector, the Rev. Henry Canham, LL.B., described the church. He said the lower part of the tower was Saxon, the chancel arch was Norman, and the east window, filled with stained-glass in memory of the late rector, the Rev. Ayscough Fawkes, was Perpendicular. Some of the monuments, especially those of the Lindleys, were interesting. The village stocks were near the church. It had been proposed to have tea on the lawn in front of the rectory, but a violent storm of thunder and rain prevented the scheme from being carried into effect, and it was served in a marquee especially erected for the occasion. Mr. T. T. Empsall, the president, presided, and upon the motion of Mr. C. A. Federer, seconded by Mr. H. J. Barber, of Brighouse, votes of thanks were passed to the vicars of Otley and Weston for leave to see the churches; to Colonel Dawson for permitting them to see over Weston Hall; to Mr. C. J. Newstead for kindly acting as cicerone; and to the Rev. Henry Canham for his description of the church and his generous hospitality.

HOME FOR THE COUNTY COUNCIL.

A LETTER has been addressed by Mr. C. J. Stewart, official receiver of companies in liquidation, to the members of the London County Council, calling their attention to the proposal which he had submitted to them last March for the purchase of that portion of the assets of J. W. Hobbs & Co., consisting of the fine building on the Embankment adjoining the National Liberal Club and twelve houses in Cecil Street. The price, free of all mortgages, is 400,000*l.* Mr. Stewart submits that in many respects the property is admirably suited to the purposes of the County Council, the position being central, the buildings imposing in appearance, and the

site one of the finest in London. The price which has been fixed is, he considers, a very low one, amounting to 5*l.* 8*s.* per square foot, whereas the price of the site recommended by the establishment committee of the Council works out at 7*l.* 13*s.* per square foot. The cost of finishing the main building and making it ready for use is estimated at 60,000*l.* Mr. Stewart describes the property as follows:—"The main part of the building contains a hall, which would be suitable for the Council Parliament Chamber. The measurements are about 74 feet by 54 feet, the height is 28 feet, and there is ample space for capacious galleries. The building is so constructed that the galleries would be conveniently accessible by strangers and pressmen without coming in contact with members of the Council. Part of the original scheme was to build an eastern wing corresponding with the western wing now in course of erection, but this part of the scheme is untouched, and twelve houses in Cecil Street, producing a rental of 865*l.*, are still standing on the site of the proposed eastern wing. Under the courtyard which lies between the main block of building and the Strand are vaults with an underground roadway. The vaults are estimated to produce a rental of 4,500*l.* a year. The main building contains many rooms of very large size (besides those shown on the plan) which seem to be well adapted for the purpose of committee-rooms, and in addition to the large rooms there are over 200 smaller rooms in the main building alone, besides those in the western wing. These smaller rooms are suitable for offices in their present form, or, if desired, can be increased in size at a minimum expense by taking out partition-walls. The buildings are fireproof and soundproof throughout." Mr. Stewart's letter is accompanied by plans showing, among other things, the alterations which would be necessary in order to convert the large hall into a council-chamber. He observes that in the event of the hall not being considered suitable for a permanent council-chamber, the site of the proposed eastern wing, about three-quarters of an acre, would be available for the erection of a new council-chamber, and until it was completed the large hall might be used temporarily.

GENERAL.

The sum of nearly 5,000*l.* was subscribed at a meeting just held of the parishioners of St. Andrew's, Cardiff, for building a new church for the parish at an estimated cost of 8,000*l.*

Dean Lefroy is taking steps for raising a fund of 12,000*l.* for the completion of the restoration of Norwich Cathedral. The Dean hopes to complete the restoration of the entire cathedral by 1896, when will be celebrated the 800th anniversary of its foundation.

An Exhibition of works by local artists, under the auspices of the Dundee Graphic Arts Association, has been opened in the Art Galleries, Dundee.

Plans for the new post-office to be erected in Church Street, Coatbridge, were formally presented to the Dean of Guild Court.

The Marble Statue of William Roscoe, by Sir Francis Chantrey, recently removed from the Royal Institution, Liverpool, was being raised by a derrick to the position it was intended to occupy in St. George's Hall, when, the chain breaking, it fell a distance of about eight feet. The head was knocked off, the nose broken, and the face otherwise mutilated, but the damage can, it is stated, be repaired. The statue was valued at 1,000*l.*, and weighed something like 30 cwt.

Mr. E. Burne-Jones has been elected a member of the Société Nationale des Beaux-Arts, the artists who hold exhibitions in the Champ de Mars.

Messrs. Beaumont, of Manchester, have been commissioned to prepare plans for three chapels which are to be erected in the cemetery of Hyde, near Manchester.

The Durham University Authorities have decided to confer honorary degrees on Mr. Alma-Tadema and Mr. Alfred Gilbert.

The Richmond Corporation intend to purchase the picturesque Thames eyot situated between Brentford and Kew Bridge, an agreement being sealed by which the island becomes the absolute property of the Corporation in perpetuity. The purchase-money amounts to about 400*l.* The Corporation, it is understood, intend to put it in thorough order, with the view to its future preservation and to maintain the beauty of the river at that point.

The Improvement Committee of the Sheffield Town Council recommend that the Council adopt the suggestion of their architect, Mr. E. W. Mountford, to line the walls and principal staircase and corridor of the new Town Hall with various marbles, in accordance with his plan, at an estimated cost of 2,335*l.*—a small sum in regard to the size and importance of the building.

The Architect.

THE WEEK.

ARCHITECTS will remember the admirable drawings of buildings which Mr. WILLIAM SCOTT used to produce. They are also aware that during several years he has made Venice his home, and there he has been accepted as the representative of English art, for Mr. SCOTT's remarkable versatility has enabled him to be as successful in oil-painting, water-colour drawings and in etching as he was as an architect. A collection of some of his etchings of Venice can now be seen at Mr. STACEY's Gallery, 28 Old Bond Street, which is well deserving of a visit, not only from the friends of the artist and architects, but from all lovers of art. There are twenty-five plates, which represent Venice under varying conditions. Mr. SCOTT is no ephemeral tourist; he knows every part of the city, as it were, by heart, and much which he shows will consequently appear novel to many people who are supposed to be well acquainted with Venice. He is not satisfied with representing the exterior of buildings; the views of the interior of St. Mark's will suggest why that building has charmed strangers for centuries, and seems destined to fascinate them still more as time runs on. There is also an interesting view of the Palazzo Rezzonico, where ROBERT BROWNING died, and which now belongs to his son, the painter. One of the best of the plates is a view of Venice from the lagoons, and which reveals the weed-covered silt from which the city arose. The exhibition deserves to be considered as one of the most attractive of the season, and it will give satisfaction to many visitors as evidence of the progress which Mr. WILLIAM SCOTT has made under favourable conditions.

THE annual report of the Liverpool Architectural Society states that there are 125 members, an increase of 10 over last year's number. They comprise 46 fellows, 28 associates, 36 students, and 15 honorary members. The Council hope that before another session begins they will have arranged a system of education with University College which will be beneficial to all young architects and students of architecture, and they hope that their efforts will be reciprocated and that the classes will be well attended. It is regretted that the excursions held in the summer to places outside Liverpool are so sparsely attended, as the younger members ought to benefit considerably by mixing with the older members in this way. The Students' Committee report that the lectures were very well attended for some time, but latterly they showed a considerable falling off in numbers. Home work has been set by each of the lecturers, who have awarded marks to each student. The works sent in proved of a very high order. It was originally intended to hold an examination at the close of the session, but as a sufficient number of candidates did not present themselves, this was not carried out. The committee, however, recommend the Council to award a prize to Mr. C. W. HARRIS, who obtained the highest number of marks for work done during the session. Some account may be given for the falling off in the attendance in the fact of the library being unsuited for the holding of classes, both for sanitary reasons and also that, owing to the non-residence of a keeper on the premises, the lecturers and students have at times experienced a difficulty in obtaining access to the room.

THE programme of the Congress of Architects which was to be held during the week in Paris does not offer any item which would tempt a visitor to cross the Channel. Papers on an archæological exploration in China and on a visionary scheme of a water supply for Paris to be derived from Neufchâtel could be as well read at any time and in any place as in Paris on a sultry day. The eternal discussion about architectural instruction in the provinces suggests how little power the societies have to deal with the subject. Another subject put down for consideration is "du repos hebdomadaire," for English pupils and assistants who may be sighing after the advantages which their brethren in Paris enjoy would do well to remember that the Sabbath is

not always a day of rest in French offices, and the needful reform will never be accomplished by a resolution of any congress. As long as the Société Centrale keeps to a jog-trot course its weakness is known only to the members, who are indifferent, but the annual meetings reveal the fact to outsiders.

THE governing body of the Polytechnic Institute for South London have appealed for aid to assist in securing the sum still necessary for the completion of the scheme. An annual income of fifteen hundred pounds is obtainable on condition that an equivalent sum of fifty thousand pounds is raised by subscription. Up to the present time donations have been obtained to the amount of about forty thousand pounds (including the value of the site presented by Lord CADOGAN), and therefore a sum of about ten thousand pounds still remains to be collected. The governing body have received the authorisation of the Charity Commissioners to carry out a portion of the plans of the building, and the work will be forthwith begun. The Commissioners have further consented to allow the income of fifteen hundred pounds a year to be paid from the date of opening the portion first built, subject to the whole of the required fifty thousand pounds being made up within a strictly limited period. It will not, however, be possible to carry out the scheme in its entirety, or to claim the endowment in permanence, until the remaining ten thousand pounds are secured. Under present conditions it will be necessary in the first instance to omit such vital portions of the recreative side of the Polytechnic as the gymnasium and large hall. But it is obviously desirable, on economical as well as on all other grounds, that the whole building should be erected at once, rather than that the plans should be carried out in portions. Any donations therefore will now be specially valuable, as they will enable the governing body during the present season to undertake building operations on a larger scale, and commence over a wider area the active work of the Institute.

THE auction of the Spitzer collection has ended, and the amount received has amounted to 9,107,931 francs, or about 365,000*l*. The experts who calculated the value of the collection at 400,000*l*. were not far out, for in such cases it is impossible to foresee what may happen, and the bid-dings for many objects are likely to exceed the market value. It denotes the power which antiquity still possesses when we find collectors from many parts of the world struggling for two months in the hope that they may carry off treasures. It is generally understood that an Australian, Mr. GEORGE SALTING, has been the hero of the auction, for his captures have excited the envy of all rivals. Thanks to him, it may be calculated that Great Britain secured a third part of the objects, France another third, and Germany, Austria and Belgium the remainder. The collection of arms has yet to find its way under the hammer, when probably three millions of francs will be obtained by the representatives of M. SPITZER. The proceeds of the sale are sufficient to prove that there is little difficulty in finding enormous sums to gratify the passion for acquiring bric-à-brac.

THE decision which was given on Monday by three judges of the Queen's Bench Division respecting the new block of buildings at the corner of Kensington Court is of vast importance to builders. The site was part of the ground on which Baron GRANT's house stood, and its value was determined by the fact that it faced Kensington Gardens. At the side and behind are the houses forming Kensington Court. For taxation and other purposes the large block will be assessed as part of Kensington Road. The London County Council, however, regarded the block as part of the narrower Kensington Court in order to insist on a reduction of the height. The magistrate who first heard the case declined to take that view, but stated a case. Owing to the cost of taking down, Mr. Justice DAY and Mr. Justice BRUCE desired to have the case reargued before three other judges. On Monday decision was given that the Building Act was violated, and the case was sent back to the magistrate in order that the builders may be convicted. It is a remarkable conclusion.

NOTES, PRINCIPALLY ON ENGLISH "GEOMETRICAL DECORATED" WINDOWS.

III.

BY A CORRESPONDENT.

AT Wellingborough Church, as at Howden, there is a beautiful feature over a large five-light window, as the label has an ogee top with a finial, and the bases of two slender pinnacles sit upon the label and flank a pretty canopied niche in front of the battlemented gable coping. This detail in no way detracts from the importance of the tracery window-head, but on the contrary tends to add to its dignity.

The good proportion of tracery openings, the one with the other, as well as their individual grace of outline, ought to be most carefully considered. Take as an example the beautiful Decorated tracery to the window at Herne Church, Kent, in which this principle is very well observed. Where there is space, trefoils, quatrefoils and cinquefoils are used, the heads of the very wide lights being the only exception where the trefoil cusp looks somewhat large and out of scale. But in windows of that period the cinquefoil-headed light was exceptional. The double sill, the substantial character of mullions and tracery and the due subordination of mouldings in this elegant window are all well worth study. Looking at the Early Decorated windows to the Chapter-house at Wells Cathedral, it is necessary to be almost hypercritical to find a single failing. Everything is so good, including the handsome sills previously commented on. The mullions are also massive and well moulded and the tracery follows suit. The rich jambs with the ball-flower in the hollows and the ogee-headed crocketed and finialed hood-mould give an appropriate crowning finish to the ornate work beneath. It is really only in the balance of forms in the tracery circles of this example where any alteration could be desired. For the two smaller circles are cinque-foiled, just like the central one, though only of about half the diameter. But in another instance, the large five-light Decorated window to the church of the Holy Trinity, Hull, the spherical triangles in the tracery-head contain a trefoil with three smaller trefoils attached, the proportion of the former to the latter being as nearly three to one. This does not seem quite as it should be, and the tracery in other respects is also of somewhat "mixed" character, so that the result is not harmonious.

Referring to a Flowing Decorated east window at Yaxley Church, Huntingdonshire, EDMUND SHARPE remarks that "there is sufficient variety in the design without the occurrence of any strong contrast, and sufficient similarity in the principal features of the tracery, at the same time that the monotony of Flamboyance is avoided." The proper principles of good window tracery are here admirably enunciated. But Mr. SHARPE might have said that even more monotonous than French Flamboyant tracery is the Reticulated, of which so many Mediæval examples are found in England. The very derivation of the name is sufficient to stamp the diaper-like character of such window-tracery, in which any architectural composition, properly so called, is impossible. It is true that in many windows during the whole of the Geometrical Decorated period is found the principle of intersecting tracery, or, to quote Mr. SHARPE, "those in which the mullions bearing the principal tracery-bars are continued through the window-head in arcs of similar curvature, and intersecting one another, terminate in the window-arch." But though the divisions must thus become somewhat equable, the sameness or repetition can never be as great as in the Reticulated style. There is another type of Geometrical Decorated window, of three, four and five lights, where the tracery has no dominant leading lines, and consequently only one order of mouldings is used, the Geometrical forms being arranged to fit together as elegantly as can be managed. This may be pretty, but does not convey to the mind the idea of a well-thought-out architectural composition, and may rather be compared to the ingenuity of the piecemeal planning of a child's puzzle, or the elaborate devices of Moorish ornamentation. There is too much sameness in the parts for good effect. In some windows of the Flowing Decorated period, though the mullions contain two orders, both are continued throughout

the tracery-head, as is often seen in French Flamboyant, and this has not the good appearance of the usual subordination of mouldings in English Decorated examples.

Floriated cusp-points might with advantage be more often used than they are in tracery, as they give variety and richness in a place where it is valuable. The elegant Geometrical two-light Decorated window at Solihull Church, Warwickshire, is an example where all the cusps are embellished so. This specimen is also remarkable for the peculiar shaped foliation in the tracery-head. No necessity, however, exists, as there, to florate all the cusps, and it may well be confined to some central feature in the composition.*

The centre-piece to tracery is generally the leading feature in Geometrical Decorated windows; but it is well not to always lay too much stress on this point, as academic rules are apt to result in stiff-looking work. There is an Early Decorated five-light window at the east end of the refectory to the beautiful abbey at Easby, near Richmond, Yorkshire, which Mr. SHARPE comments on as being remarkable in this respect:—"The large circle which forms the centre-piece is not carried, as is usual, upon the shoulders of two arches, but rests upon two smaller circles; the surface mouldings of these circles do not intersect with those of the centre-piece." An architect at the present day would hesitate before he so constructed his tracery. Nevertheless, the effect is excellent, and shows what a skilful designer, one who knows when to relax, can do.

As containing Domestic examples of window-tracery, the fine Manor house at Winfield, Derbyshire, takes a high place, though there is nothing earlier in it than fifteenth-century work. The beautiful window to the entrance porch of the great hall is remarkable, though square-headed, as looking far more like Decorated than Perpendicular, both in its elaborate tracery-head and in the mouldings to the mullions and jambs, which are of a very rich character, especially internally, where they take the place of a plain splayed reveal. The roll or bowtell is a leading feature instead of the fillet, and in this case with excellent effect. The writer is of opinion that, as a general rule, even where the mouldings and tracery are rich and elaborate, the roll as the central feature in the mullions and head is not so telling, though no doubt more decorative, as the fillet. It is for that reason, probably, that the latter is so much more frequently found than the former. There are some other beautiful windows at Winfield Manor to the bay of the great hall, which *look* considerably later in date, though not much so, than the before-mentioned example, as the window-arch is four-centred, the mullions and jamb mouldings being simple and of a usual Perpendicular type. It is in the transomes where so much richness occurs, as the foliations are inverted, with tracery, so that the transome becomes a more important feature than usual. There is also a very large and fine window to the south end of the "State apartment," which like some of the specimens before alluded to has a crocketed hood-mould surmounted by a carved finial. At the springing line of the window-arch is a transome extending over the two central lights, those at the side having a transome lower down, forming a part of the tracery. Lower down is the regular transome, stretching the whole width of the window in the usual manner. There is a peculiar effect in the upper part of the tracery-head, caused by the first order being carried round in such a manner as to give a kind of shouldered or square-headed trefoil appearance. The three windows at Winfield Manor that have been mentioned are all certainly designed to suit their locale. They are differently treated to Church windows. There are other good examples of windows of Domestic character in the old Manor house which do not call for any particular comment. It would be difficult to find elsewhere in one spot such a number of specimens exhibiting so much variety in design, and the writer being familiar with the building has pleasure in describing some of its interesting points.

The important subject of the due subordination of the mouldings of Decorated windows was very ably worked out

* Carved ornaments might also be more often employed in the jambs, externally, in those happy cases where expense is not so much an object, thus giving additional life and interest to the window.

by EDMUND SHARPE, though at the present day, when Gothic principles are so well understood, some of his comments may appear to give almost elementary information. He remarks on page 51 that "the different orders of the window-arch seldom consist of the same mouldings, and do not often even resemble each other. This is, perhaps, less the case with the earliest windows than with the later ones." He proceeds to say, "On the other hand, the rich series of curvilinear arch-mouldings, commencing with Carlisle and ending with Beverley, exhibit profiles of great variety and beauty." Further on, "As soon, however, as the double ogee began to be a prevalent curve, the practice of repetition in the orders of mouldings, both of windows and doorways, became again very common." All this is very interesting. In some thirteenth-century work there is good reason for saying the mouldings have the effect of bundles of reeds tied together, and this complaint is justified by their sameness, also by the want of proper prominence and boldness to the leading members of the several groups of mouldings. Again, page 53, SHARPE says, "The section of a tracery-bar is usually the same on both sides. This rule, which may be said to obtain throughout the whole of the Curvilinear period, has its exceptions in the Geometrical period. Occasionally the circular centrepiece has a different series of mouldings on the inside and on the outside. . . . Where, also, two orders of Foliation are used, not occurring together, a Tracery-bar will sometimes show a different profile on its two sides." Even were there no Mediæval precedent for what SHARPE has described, there can be no reason whatever why, when the architect thinks fit, he may not act according to the particular circumstances. For example, the employment of what has sometimes been called "edge-tracery" (*i.e.* where the fillet is dispensed with and the plain chamfers or hollow chamfers, as the case may be, meet in an aris) is very useful where the tracery requires to be lightened, more particularly in wood-work. For the same mouldings can be used in the same window with or without the fillet. What is somewhat unfortunately termed a "false" mitre is also handy in those parts of tracery where the plan just mentioned does not suit, so as to get a perforation. Even although an architect gives a drawing of the tracery half or full size, he is sure to find that he can improve it when he has seen the masons set it out full size on the boards, as every architect ought to make a point of doing if he possibly can. It is very apparent that much of old Geometrical tracery was never struck in by compasses, and varies in outline where, according to rule, it ought to be the same. In modern practice such a procedure is undesirable, but at the same time it will be found that an occasional deviation from compasses is a decided help. It was just remarked that some license might be taken in lightening tracery, but, on the other hand, there is occasionally an advantage in giving, at any rate, an *appearance* of strength where desirable by refraining to pierce according to routine. What ought to be avoided is any "cut-and-dried" look to a window. It should show the evidence of the care and thought bestowed upon it by the designer, and not look as if turned out from a mill. To make one last quotation from EDMUND SHARPE:—"Much ingenuity is often shown in the manner in which these three members of a traceried window [*i.e.* window-arch, scoinson-arch and rear-vault] are respectively arranged and united with its lower part and with one another; and the subject is one which deserves more attention and study than is usually bestowed upon it." These words might be written in letters of gold, so true are they. But, happily, since they were penned architects have begun to pay a good deal more attention to the point SHARPE alludes to than they did then. But, with the best intentions, what can the unfortunate architect do who is tied and bound by want of funds placed at his disposal? It is most difficult to find room for a window-arch well recessed from the exterior, an ornamental rear-vault, and a bold drop-arch for internal effect—for it means walls of substantial thickness. The successful treatment of a scoinson arch is important, for it gives a charming variety, and prevents a too large soffit where the window is placed at a considerable height. If treated in combination with an order of tracery distinct from that of the exterior of the window the effect is the more enhanced, as it gives that slight feeling of mystery which is so valuable an aid to the architect.

The writer has now arrived at his limit of space, but trusts that the few observations he has been privileged to make may possess some little interest, being the outcome of some thought, as also of practical experience.

THE BROTHERS VAN OSTADE.*

IN the history of painting there are few circumstances more remarkable than the revolution which took place in Holland when artists renounced the portrayal of imaginative scenes, and holding as it were the mirror up to nature, represented the men, women and children, the animals, the trees, the houses, the fields, canals and the sky which could be seen every day. According to the theories by which epic grandeur was indispensable in everything that claimed to be art, the Dutchmen's efforts will not appear to have much importance. REYNOLDS could only admit that they had "the same right in different degrees to the name of a painter which a satirist, an epigrammist, a sonneteer, a writer of pastorals or descriptive poetry has to that of a poet." As a painter, who was always experimenting, he could not be indifferent to the technique that is visible in the Dutchmen's works, but the President considered it was out of place. The "correct, firm and determined pencil which was employed on vulgar and mean subjects" if he had his way would "without any change be employed on the highest, to which indeed it seems more properly to belong." In the case of another master of the school it was only necessary for him to have been born in Rome, when, as REYNOLDS believed, "the same sagacity and penetration which distinguish so accurately the different characters and expression in his vulgar figures would, when exerted in the selection and imitation of what was great and elevated in nature, have been equally successful, and he now would have ranged with the great pillars and supporters of our art." It could not be foreseen in 1774 that science would compel people to seek after reality in all things, and that poets and painters would have to occupy themselves with something else besides "things unknown."

ADRIAAN VAN OSTADE is one of the painters who convey to us the most accurate notions of Dutch life in the seventeenth century. That life was toilsome. The men who kept out the waters from their fields, and who built houses in swampy places, must have gone through very onerous tasks every day. OSTADE does not show them at work; he preferred to represent his countrymen during their hours of relaxation. The tedium of existence was lightened in simple ways. A game at bowls, the sound of a squeaking fiddle, a pipe of tobacco, a few glasses of beer, a dance, seemed to be sufficient to drive away dull care. His brother ISAAK was more partial to out-of-door scenes, and to some extent supplemented his brother's work. The combination of their pictures gives a very exact representation of peasant life in Holland at one time.

Most of the later biographies tell us that the two artists were born at Haarlem, a town which lays claims to other notabilities. The evidence of their birth is unquestionable, and it is hard to see on what grounds they could at one time be described as Germans and natives of Lübeck. The elder was baptized on September 10, 1610, and the younger on June 2, 1621. The father appears to have been a master weaver. The brothers spent their lives in Haarlem.

FRANZ HALS was at that time living in the town, and ADRIAAN VAN OSTADE became the pupil of a master who, according to REYNOLDS, was better able to express individual character than any other portraitist. Among his fellow pupils was ADRIAAN BROUWER. OSTADE made good use of the opportunities which were to be found in the atelier of FRANZ HALS, for his earliest works denote that his powers were disciplined. The chiaroscuro of his interiors reveals that he had seen and was influenced by some works of REMBRANDT.

It is not, however, on account of their illumination that the paintings of OSTADE are appreciated. The lighting is only one element in their interest, and by means of the humblest hovel becomes attractive. But what mainly

* *Les Artistes Célèbres: Les Van Ostade.* Par Marguerite Van de Wiele. Ouvrage accompagné de 65 gravures. Paris: L. Allison et Cie

constitutes the charm of the pictures is the sense they convey of fidelity to nature. The peasants are never posed; the figures seem as if struck off instantaneously, and the appearance of occasional coarseness does not diminish their real worth. OSTADE'S Dutchmen are a kindly race; they are fond of company, but they also like to have children beside them, and the presence of little boys and girls elevates the character of the commonest beer-house. The people are not a handsome race; there are no figures qualified to serve as models of APOLLOS and VENUSES, and the costume does not make us think highly of the tailors and dressmakers. They stand before us, however, just as nature and sartorial ingenuity made them, and more refined figures would not be able to deal with the difficulties which beset the contemporaries of VAN OSTADE. The painter was faithful to the labourers, for it is rare to find him depicting such a scene as a notary's office. When he represents a painter at work the artist differs little from a peasant, and the old alchemist we see in the picture in the National Gallery also seems like a man who has mistaken his vocation, and the inscription that lies on the three-legged stool, "*Oleum et operam perdis*," is a warning to all who thought of escaping from field work. It is creditable to the amateurs of the time that they could find pleasure in possessing such lowly scenes. They paid good prices to the OSTADES for their reproductions of nature, and there can be no doubt they acted more sensibly than if they expended their florins on mythological scenes or imitations of Italian allegories. The Dutch patrons of art sought pictures as embellishments of their houses, and were on that account obliged to have only small works. There were no churches and few palaces in which painting could be utilised. When a picture was commissioned for a public hall it was intended to be a glorification of the Corporation, like REMBRANDT'S so-called *Night Watch* and VAN DER HELST'S *Schuttersmaaltyd*, and was not therefore far removed from a *genre* piece. Yet with all the restrictions Holland was able to produce in the course of a few years a body of painters of undeniable genius, whose works are now prized mainly on account of those local and temporary peculiarities which in the eyes of some judges made them worthless.

The people who bought the pictures from the artists found more interest in the subjects than is possible with strangers. For them also the colouring must have had peculiar charms. Strangers who can enjoy only occasional glances at Holland may imagine that it is a dull country, and the warmth which is seen in many pictures will to them appear unnatural. FUSELI spoke with contempt of the Dutchmen who succeeded REMBRANDT because, according to the censor, they "were content to tip the cottage, the hamlet, the boor, the ale-pot, the shambles and the haze of winter with orient hues or the glow of setting summer suns." A native, however, would not object to the hues or the glow. ADRIAAN VAN OSTADE in his early pictures gave the effect of a country when cool tones prevailed; afterwards he preferred effects that may be called golden. Is it not evident that with experience he became more courageous, and was not afraid to record the refinements of colour which were around him? In his latest paintings there are parts which are over-glaring, but this is only an indication that, like TURNER, his eyes had become weakened.

About ADRIAAN VAN OSTADE'S life in Haarlem little is known beyond what can be derived from entries in registers. He was a member of the local guild of St. Luke. In 1636 he was selected with others of the Oudeschurz, or artillery veterans, to form part of the civic guard. We also find that he joined another soldierly body, the Arbalatiers. He married MACHTELGEN PIETERSE in 1638. Four years afterwards she died, and immediately the painter consoled himself by a union with a lady whose initials only are recorded, "N. N." When his second wife died in 1666, VAN OSTADE was able to expend no less than forty florins on her funeral. He died in 1685, in his house in the street known as the Nieuwe Kruysstraat, and was buried in the church of St. Bavon. He left behind about two hundred unsold pictures, besides many etched plates.

IZAAK VAN OSTADE was born eleven years after his brother and his teacher ADRIAAN, and he died about twenty-five years before him. He seems to have been of a joyous

disposition, and he preferred out-of-door scenes to interiors. He shows the peasants drinking at the doors of taverns surrounded by trees, and with sunlight brightening the figures instead of crowded or smoky kitchens. His winter scenes reveal that, like a true Dutchman, he found the season to be one of the pleasantest of the year, since it made active exercise a necessity. Brief as was his life, IZAAK produced over a hundred paintings, and English amateurs were among the strangers who earliest appreciated their value. Two of his works, and one by ADRIAAN, were in the Peel Collection, purchased in 1871, and are now in the National Gallery.

The biographies of the two artists by Mdlle. MARGUERITE VAN DE WIELE are evidently inspired by a desire to insure that henceforth it will be impossible for any writer to assert that the VAN OSTADES were Germans. This duty has been fulfilled, and there can be no gainsaying that the painters were by birth, as by disposition, genuine Dutchmen. Many other errors which are repeated in books are also corrected. The authoress is an enthusiast, and the paintings of the VAN OSTADES are explained with a knowledge of the subjects in which research is united to acquaintance with the country and the successors of the people that were represented by the artists. The latest addition to the series is one of the most delightful, and the reproduction of so many rare etchings in the pages enhances its worth.

ARCHÆOLOGY ILLUSTRATED.

THE first number of the first volume of the *Illustrated Archaeologist*, edited by Mr. J. Romilly Allen, F.S.A.Scot., has just appeared under date of June. This new quarterly will have interest for many. The price is nominal, and the magazine is true to title, being profusely illustrated. Among so much that is interesting, perhaps no article will prove more so to architects than that on "Sculptured Norman Capitals at Southwell Minster," by Mr. Romilly Allen. We give the following:—

The existence of a very fine series of sculptured Norman capitals at Southwell Minster, Notts., has long been known, as they are mentioned in the Rev. Canon J. F. Dimock's "*Illustrations of the Collegiate Church of Southwell*," published as far back as 1854. It might have been thought that objects of such supreme interest to students of early Christian art would have attracted the attention of archaeologists before now. This, however, does not appear to have been the case, and the reason for their having remained so long neglected is probably on account of the inaccessible position in which the capitals are placed, high above the floor of the church and partially concealed by the organ on the top of the rood-loft. When the organ was taken down in May 1892, the sculptured capitals could be seen without difficulty, and some admirable photographs were taken by Mr. A. J. Loughton, of Southwell. It is with extreme regret that we learn that the capitals are now again hidden, with the exception of the sides facing the nave, and these can only be seen with the aid of a ladder. The Ecclesiastical Commissioners' architect, under whose charge the fabric of the Minster is placed, is Mr. Ewan Christian, and the new organ was built by Messrs. Bishop & Sons.

It is a great pity that these gentlemen could not between them have devised some means by which their "kist o' whistles" might have been so arranged as not to interfere with the view of the sculptured capitals, which presumably were intended by the Norman architect to be seen. As a general rule, the better the architect the greater his contempt for the work of his predecessors. Under these circumstances we feel sure Mr. Ewan Christian will pardon our expressing our opinion that he is a good architect.

The sculptured Norman capitals at Southwell are those which support the eastern arch of the central tower of the Minster. There are three capitals on each side, the inner order of the arch moulding springing from the larger ones in the middle of the jambs, and the outer orders from those on each of the angles of the jambs. The peculiar form of the capitals, with a square projection in the middle and volutes at the corners, is characteristic of Norman work of the end of the eleventh or beginning of the twelfth century. There are examples in England at Lincoln and Norwich Cathedrals, and at St. John's Chapel in the Tower of London. M. de Caumont, in his "*Abécédaire d'Archéologie*," informs us that this kind of capital is the most simple and at the same time the most common which is to be found in churches of the eleventh century in France, more especially in the central and north-eastern districts. These capitals are generally plain, as at St. Nicholas's Church at Caen (*circa* A.D. 1100), but there are instances

decorated with figure subjects at St. Benoît sur Loire and elsewhere.

The date of the sculptured capitals at Southwell, as determined by comparative archæology, corresponds very nearly with that assigned to them by history. The Rev. Canon J. F. Dimock, in a paper in the "Journal of the British Archæological Association" (vol. viii. page 265), on the Church of the Blessed Mary the Virgin, of Southwell, tells us that the ancient register of Southwell, called the "White Book," contains a letter from an Archbishop of York, named Thomas, addressed to all his parishioners of Nottinghamshire, in which he prays them to "assist with their alms to the building of the church of St. Mary of Suwell." There were only two Archbishops of York, named Thomas at this period, one A.D. 1070 to 1100, and the other A.D. 1109 to 1114. Canon Dimock thinks that the second of these two is more probably the one who wrote the letter in question. The subjects on the Southwell capitals are all scriptural.

Mr. Romilly Allen then proceeds to describe them, but it is necessary that the fine illustrations should be looked at to appreciate the work described.

There is much of interest in "The Cup of Ballafletcher," by Mr. E. Sidney Hartland, which contains descriptions of the fairy cups and horns, and the legends attaching to them.

The famous Oldenburg Horn, preserved at the palace of Rosenborg, at Copenhagen, is, he says, another vessel to which a fairy origin is attributed. The earliest account of it is found in Hamelmann's "Oldenburger Chronik," written late in the sixteenth century; and the same story in all essentials is still repeated by the Oldenburg folk. The story is that, on July 20, 990, the then Count of Oldenburg was hunting in the forest of Bernefeuer, when he started a roe and followed it to the Osenberg, distancing all his attendants. The weather was hot, and the Count, thirsty with his ride, wished audibly for a draught of water. Scarcely had he uttered the wish when the hill opened and a lovely damsel appeared with this horn in her hand and offered him drink. Not liking the look of the beverage, he declined to drink. Whereupon she pressed him to do so, assuring him that it would go well with him and his thenceforth and with the whole house of Oldenburg, but if he refused there would be no unity from that time forth in the family. He put no faith in her words; instead of drinking he poured out the contents, which took the hair off his horse wherever they splashed him, and galloped away with the horn. An examination of the vessel shows that it belongs to the middle of the fifteenth century. It is of silver-gilt, bearing enamelled coats-of-arms and inscriptions to the effect that it was made for King Christian I. of Denmark, in honour of the three kings of Cologne.

The museum at Bergen in Norway contains several horns of a similar kind. One of them is said to have been presented filled with drink by a troll-wife in Hallingdale, one Christmas Eve, to a man named Gudbrand Godberg. He threw the drink over his shoulder and rode off with the horn. The troll cursed his posterity down to the ninth generation to be afflicted with some bodily blemish, and it is said the curse was literally fulfilled. This horn is encircled by a strong band of gilt copper, inscribed with the names of the three kings, and bears an oval crystal set in a plate also of gilt copper. In the museum at Arendale is a horn known as the Oiestad horn, which was an heirloom in the family of a man whose daughter eloped with her lover on St. John's Day. Pursuing them he was stopped by a troll, who offered him drink in this horn. He flung out the contents, which, falling on his horse's loins, burnt the hair off and fled. Fortunately he was delivered from pursuit by the crowing of a cock, and at length caught his daughter, and stabbed her lover to death. The horn is encircled with rings of silver gilt, and bears an inscription invoking the blessing of God and the three kings on the drink of their servants.

Sweden, too, rejoices in several of these treasures. A drawing of one of them, for which I am indebted to Professor Dr. George Stephens, appeared in the *Illustreret Tidende* of Copenhagen in the year 1881. The story attached to it relates that one Christmas night, in the year 1490, Fru Cissela Ulftand, the lady of Ljungby, in Scania, heard from her mansion a sound of revelry proceeding from a great stone on her estate known as the Magle stone, and sent one of her boldest servants to see what was going on. He found the stone raised, and the trolls dancing noisily beneath it. A beautiful female stepped forth, and presenting to the guest this drinking-horn and a pipe, requested him to drink the troll king's health and blow in the pipe. Instead of complying, he seized both the horn and pipe and galloped back to his mistress, pursued by the trolls in full cry. They offered prosperity and riches to the lady if she would restore the pipe and horn, but she persisted in keeping them, and they are still preserved at Ljungby. The adventurous servant, however, died three days after; his horse died on the second day; the mansion has been twice burnt, and the Ulftand family has never prospered since the theft from the trolls. The horn is stated to be of an unknown

mixture of metals, with brazen ornaments, and the pipe to be a horse's leg-bone.

In various churches of Denmark there are said to be chalices of which legends akin to these are told. At Aagerup a man went down on Christmas Eve to see the trolls making merry. He spent the night with them, and as he departed they invited him to come again next year. A troll maiden then brought him a stirrup-cup. He, however, had his suspicions, so, casting behind him the contents of the cup, he spurred his horse and rode away. The trolls followed, but had a difficulty in keeping up with him so long as he rode on ploughed land. When he took to the highway they gained on him, so that he was in great danger. At length he reached the churchyard, and threw the cup over the wall into the consecrated enclosure, where they could not get it. It is described as of gold. The liquor, where it touched the horse's back, took off the hair.

In "A very ancient Industry," Mr. Edward Lovett describes what is probably one of the sole remaining industries that can be traced back as practised by the very earliest aboriginal inhabitants of these islands, and still carried on in the village of Brandon, situated on the borders of Suffolk and Norfolk, is an industry connected with the Stone Age, and consisting in the manufacture of gun-flints, &c. "Half an Hour in the Grosvenor Museum, Chester," a "Saxon Doorway at Somerford-Keynes," will also interest the readers.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE members of this Society, to the number of about fifty, paid a visit to the interesting house which has recently been built for Mr. R. W. Hudson upon the western slope of Bidston Hill. The party was met at the entrance by the owner and Mr. E. A. Ould, of the firm of Grayson & Ould, the architects of the building, and two hours were spent in examining the various works, after which a portion of the visitors proceeded to the Bidston Observatory, where they were met by Mr. W. E. Plummer, M.A., F.R.A.S., the astronomer, who explained to an interested audience the many scientific instruments under his charge.

Bidston Court is one of the remarkable houses which has been built in this neighbourhood for many years. The visitors entered the grounds through the spreading archway of eighteenth-century wrought ironwork, pausing only to notice the lodge, the outside of which is richly decorated with embossed plasterwork in panels, containing allegorical subjects illustrating the progress of youth to old age, and dawn to sunset. Turning abruptly to the left they passed under the far projecting gables of the north wing into the court-yard, little prepared for the array of fantastic timber gables, bays and dormers which form inwards round a court some 50 feet across. This court has been excavated out of the hillside 17 feet below the road, and is protected on the eastern side by a wall of solid sandstone rock. Even the sweeping winds of Bidston Hill will find it difficult to get into this quiet spot, and the sunshine which streams over the low buildings on the south side of the court is the only intruder. The extraordinary strength and massiveness of the timbers is strikingly combined with a lightness and grace which the profusion of delicate carving and fretwork give to the whole. Conspicuous in one corner rise the beautiful twin bays, gabled on every face, copied as closely as possible from old Moreton Hall. These form the keynote of the whole composition, and an effort has been made to work up to the spirit and refinement which breathes in every line of these charming windows. Upon them is carved in quaint but legible characters the inscription:—"This house was built by Robert Hudson and Gerda, his wife, Anno Dom. MDCCCXCI., these bay windows being copied from those at old Moreton Hall, in the hope that when they have perished these may remain." This explains the motive for reproducing them so exactly, for the original are in a sad state of decay. Upon beams in the gables of the porch and the great hall are the quaint verses—

When the trees are white with rime,
And the ground is black and bare,
Warmth and welcome ye shall find
Underneath these gables fair.
Charitie and jollitie
Carve on every beam of wood;
Mercie, truth, equalitie,
Man's eternal brotherhood.

Passing out of the courtyard and round the gable of the south wing another surprise was in store, for facing the whole length of the south front is the quaintest of little Dutch formal gardens, centreing round a beautiful old marble fountain which came from a palace in North Italy. The south front is less broken up than those facing the courtyard, but it harmonises admirably with its surroundings. The western façade is also rich in "black and white," but it is so shut in with Scotch firs that only occasional glimpses of it can be seen. Standing on

the topmost of a series of grassy terraces and looking over the beautiful formal garden below studded with trim yew trees, we obtain a charming view of the Welsh hills to the left, and to the right the mouth of the Mersey and the Welsh coast as far as Orme's Head. The stables, which are being erected upon the southern boundary of the property, are also black and white, and promise to be as picturesque as the house. What

must strike everybody about Bidston Court is the appearance of age which it has put on in less than two years. A brick or stone house in this position would look a parvenu for twenty years; but the house, not yet inhabited, might have been there for a hundred years, its timbers already silver-grey and its flag roof stained and bleached. This style seems to sympathise and harmonise with its natural surroundings.



"THERE is a place called Somersby, in Lincolnshire," writes Mrs. Anne Thackeray Richie, "where an old white rectory stands on the slope of a hill, and the winding lanes are shadowed by tall ashes and elm-trees, and where two brooks meet at the bottom of the glebe field." It is a place far away from us in silence and in distance, lying upon the "ridgèd wolds." They bound the horizon of the rectory garden, whence they are to be seen flowing to meet the sky.

I have never known Somersby, but I have often heard it described, and the pastoral country all about, and the quiet scattered homes. One can picture the rectory to one's self with something of a monastic sweetness and quiet; an ancient Norman cross is standing in the churchyard, and perhaps there is still a sound in the air of the bleating of flocks. It all comes before one as one reads the sketch of Tennyson's native place in the "Homes and Haunts of the British Poets":—"The village not far from the fens, in a pretty pastoral district of softly sloping hills and large ash trees. . . . The little glen in the neighbourhood, called by the old monkish name of Holywell." Tennyson sometimes speaks of this glen, which he remembers white with snowdrops in the season; and who will not recall the exquisite invocation:—

Come from the woods that belt the grey hillside,
The seven elms, the poplars four
That stand beside my father's door,
And chiefly from the brook that loves
To purl o'er matted cress and ribbed sand,
Or dimple in the dark of rushy coves. . . .

Oh hither lead thy feet!
Pour round mine ears the livelong bleat
Of the thick-fleeced sheep from wattled folds,
Upon the ridgèd wolds.

H. B. D.



THE BIRTHPLACE OF TENNYSON.

From a Water-Colour Drawing by Mr. H. P. Burke-Downing, A.R.I.B.A.

TESSERÆ.**Drury Lane Theatre.**

THE first theatre on the site of the present edifice was opened on April 8, 1663, by the King's company, under Thomas Killigrew, with Beaumont and Fletcher's play of "The Humorous Lieutenant." This house was burnt down in January 1671-72, and the new one, designed by Sir Christopher Wren, was opened with a prologue and epilogue by Dryden, on March 26, 1674. Two theatres were found sufficient for the whole of London in the time of Charles II., viz. the King's Theatre, under Killigrew, in Drury Lane, and the Duke's Theatre, under Davenant, first in Lincoln's Inn Fields, and secondly in Dorset Gardens. One was subsequently found sufficient, and on November 16, 1682, the two companies began to play together for the first time in Drury Lane. Dryden supplied both prologue and epilogue on this occasion. The Drury Lane of Wren was new-faced by the Brothers Adam before Garrick parted with his shares. A new house, the third, was built by Henry Holland, and opened March 12, 1794. This was destroyed by fire on the night of February 24, 1809, when the fourth edifice was erected and opened October 10, 1812, with a prologue by Lord Byron. This memorable fire and the advertisement of the committee for an occasional prologue gave rise to the "Rejected Addresses." Mr. B. Wyatt (the son of James Wyatt) was the architect, and the first stone was laid October 29, 1811. Here is Cibber's description of the interior of old Drury Lane:—"As there are not many spectators who may remember what form the Drury Lane Theatre stood in about forty years ago (1700), before the old Patentee, to make it hold more money, took it in his head to alter it, it were but justice to lay the original figure, which Sir Christopher Wren first gave it, and the alterations of it now standing, in a fair light. It must be observed then that the area and platform of the old stage projected about 4 foot forwarder, in a semi-oval figure, parallel to the benches of the pit; and that the former lower doors of entrance for the actors were brought down between the two foremost (and then only) Pilasters, in the place of which doors, now the stage boxes are fixt. That where the doors of entrance now are there formerly stood two additional side-wings, in front to a full set of scenes which had then almost a double effect, in their loftiness and magnificence. By this original form the usual station of the actors, in almost every scene, was advanced at least 10 foot nearer to the audience than they now can be."—Cibber's "Apology," p. 338, ed. 1740. The principal entrance to Wren's Theatre was down Playhouse Passage. Over the stage was "Vivitur Ingenio." Drury Lane Theatre, though not actually in Drury Lane, derives its name from the Cockpit Theatre in Drury Lane, where Killigrew acted before he removed to the site of the present theatre. The first Drury Lane Theatre (so called) was often described as the theatre in Covent Garden. Thus, under February 6, 1662-63, Pepys writes, "I walked up and down and looked upon the outside of the new theatre in Covent Garden, which will be very fine"; and thus Shadwell, in the preface to "The Miser," "This play was the last that was acted at the King's Theatre in Covent Garden before the fatal fire there."

Painters' Architecture.

Gilpin observes that "a piece of Palladian architecture (which presumably is only another term for regular Grecian architecture) may be elegant in the last degree; the proportion of its parts, the propriety of its ornaments, the symmetry of the whole, may be highly pleasing, but if we introduce it in a picture it immediately becomes a formal object and ceases to please." He adds, "should we wish to give it picturesque beauty we must from a smooth building turn it into a rough ruin." Were this really the case we must give up Claude as a landscape painter, for he not only has introduced a number of perfect, regular and smooth pieces of architecture into his pictures, but they frequently occupy the most conspicuous parts of them. It may even be doubted whether he may not have painted more entire buildings as principal objects than he has ruins, though many more of the latter as subordinate ones. Claude delighted in representing scenes of festive pomp and magnificence as well as of pastoral life and retirement; but if we suppose his temples abandoned, his palaces deserted and in ruins, the whole character of those splendid compositions which have so much contributed to raise him above the level of a mere landscape painter, would be destroyed. But with regard to entire buildings in contradistinction to ruins, the backgrounds and landscapes of all the great masters (particularly of N. and G. Poussin) are full of them, and the ruins few in proportion, so much so, that in the numerous set of Gaspar's, by Vivares, there are scarce any ruins to be found among numberless entire buildings. No painter more diligently studied picturesque disposition and effect than Paul Veronese, yet architecture of the most regular and finished kind forms a very essential part of his magnificent compositions. Many of these splendid edifices have the most truly beautiful appearance in pictures, especially

when they are accompanied (as in Claude's) by trees of elegant forms, and by a scenery, each part of which accords with their character. Gilpin's position might be reversed, and with more truth it could be asserted, that a piece of Palladian architecture, however elegant, however well proportioned its parts, however well-disposed and selected its ornaments, how perfect soever the symmetry of the whole, yet in the mere elevation, or placed (as it frequently is in reality), at the top of a lawn, naked and unaccompanied, is a formal object, and excites only a cold admiration of the architect's ability, but when introduced in a picture becomes a highly interesting object and universally pleases. It should be introduced as the best masters have introduced and accompanied such buildings, for there can be no doubt of the tendency of all regular architecture to formality. The skill with which that formality has been avoided by the great painters, without destroying smoothness or symmetry, is perhaps one of the strongest arguments for studying their works for the purposes of improvement.

Thirteenth-Century Gothic.

The thirteenth century was to the Mediæval art what the Periclean and Augustan ages were to the Greek and Roman; and in each case, though war and bloodshed are in themselves hostile to art, there can be no doubt that the excitements of the human mind resulting from great national struggles have tended to produce that advance in art which followed, in one case the glorious assertion of national independence, in another the conquest of the world, and in a third the romantic and unselfish efforts of the Crusaders. It was a period of deep-seated mental excitement, of a prodigious upstirring of the human intellect. Our learned men at the present day may smile at the quaint and imperfect erudition of these early periods of our civilisation, but they should remember that they were our days of youth, of warmth, and of rising vigour, while the more perfected literature of our own age may possibly be found to superadd to its maturity a few symptoms of old age. This youthful energy pervaded every branch of art; everything seemed to experience a new, a generous, and a vigorous impulse. All Europe became filled with the productions of the newly generated art; every city became a repertory of noble and sublime architecture, and every town and village became possessed of productions equally beautiful, if more modest in their pretensions; while the intervening country was studded over with castles and monastic establishments, in which the same majestic art displayed itself in ever-varying forms, each suited to meet their different requirements. Nothing is more difficult than to describe a perfected art, and the fact is that there is neither in France nor in England any marked difference between the styles during the later period of its transition, and when perfected beyond that unity and consistency of parts which indicate maturity. In France particularly this is the case; for neither had the style there continued long to evince its transitional state by the retention of strictly Romanesque features—unless the square abacus can be so designated—nor did it when perfected throw off, as in England, that one detail which to our eye seems a relic of transition. The later transition and the earlier perfected specimens seem in France to be the same art, a little more developed and more homogeneous, rather than to have many describable points of difference. In England the change of the abacus from the square to the round form makes the distinction more marked, so that English examples at the opening of the thirteenth century always appear later and more advanced than contemporary French ones. In the four examples of perfected Early English—the eastern transept of Lincoln, completed about 1200; the eastern chapels at Winchester, about 1204; the western portals of St. Albans, finished about 1205; and the western porch or Galilee at Ely, finished about 1214—none of them show any remains of transitional character, and all having the English round capital in full development, appear to the English eye more advanced than such works as the western portals of Notre Dame, at Paris, which are, if anything, somewhat later in date. In this country, in fact, the form of the abacus is the distinguishing feature between the transition and the perfected style, while in France there is no such distinction to be found. The difference is more one of feeling, which the practical eye perceives at once without being able to define.

Mass in Building.

The relative majesty of buildings depends more on the weight and vigour of their masses than on any other attribute of their design; mass of everything, of bulk, of light, of darkness, of colour, not mere sum of any of these, but breadth of hem; not broken light, nor scattered darkness, nor divided weight, but solid stone, broad sunshine, starless shade. There is not a feature, however apparently trifling, to which the principle cannot give power. The wooden fillings of belfry lights, necessary to protect their interiors from rain, are in England usually divided into a number of neatly-executed cross-bars, like those of Venetian blinds, which, of course, become as conspicuous in their sharpness as they are un-

interesting in their precise carpentry, multiplying, moreover, the horizontal lines which directly contradict those of the architecture. Abroad such necessities are met by three or four downright penthouse roofs, reaching each from within the window to the outside shafts of its mouldings; instead of the horrible row of ruled lines the space is thus divided into four or five grand masses of shadow, with grey slopes of roof above, bent or yielding into all kinds of delicious swells and curves, and covered with warm tones of moss and lichen. Very often the thing is more delightful than the stonework itself, and all because it is broad, dark and simple. It matters not how clumsy, how common the means are that get weight and shadow—sloping roof, jutting porch, projecting balcony, hollow niche, massy gargoyle, frowning parapet; get but gloom and simplicity, and all good things will follow in their place and time; do but design with the owl's eyes first, and you will gain the falcon's afterwards.

Horizontal and Vertical Disposition of Concrete.

When concrete is used to obviate the yieldingness of the soil to pressure expanse or extent of base is required to answer the end, and to secure this effect, the concrete being widely spread, should be thick or deep only with reference to its own power of transmitting to the ground the weight of the wall to be built upon it, without breaking across or being crushed. But when concrete is used as a substitute for a wall in carrying a wall down to a low level, it is in fact a wall, wide only in proportion to its comparative weakness in the absence of manipulated bond in its construction, and encased by the strong soil within which it is placed. Whether the proper object be the attainment of a sufficiently-expanded base upon a weak soil, or of the sufficient depth below ground in a strong soil, it may be, to exclude meteoric influences, the erroneous notion is that a foundation is rendered strong in the use of concrete by depth rather than by extent of base, and in consequence of this notion heavy buildings are sometimes jeopardised by the friable concrete foundation being placed on its edge instead of being laid flat to cover the breadth of soil necessary to withstand the weight of the superstructure. Concrete, indeed, is at all times more safely to be regarded as a substance to be placed as a layer than as a substance to be set up as a wall, for although with good materials, careful manipulation and patience, excellent erections as walls may be made of concrete, as erections in the same form may be made of tempered clay, neither concrete nor tempered clay is to be regarded as a proper substance with which to form the lofty walls of buildings in towns.

Casing of Hot-water Pipes.

Much of the real danger to buildings from fire would be diminished by preventing that degree of proximity between timber and all such things as can lead to its combustion. James Braidwood, who was the superintendent of the London Fire-engine Establishment, once stated in evidence before a Committee of the House of Lords, that his belief, from observation of many instances, that by long exposure to heat not much exceeding that of boiling water, timber is brought into such a condition that something like spontaneous combustion takes place; that the time might be eight or ten years; that is to say, it may have taken so long for the heat from pipes charged with or used to convey steam, hot water or heated air laid among the joists of a floor or in the heart of a partition, or elsewhere in a building encased in timber, to induce the condition necessary to the actual ignition of the timber. One case was that of Day & Martin's blacking manufactory, which was heated by means of hot water passing through iron tubes into the various parts of the building. In December, 1844, the wooden casing and other woodwork about the upright main pipes were found to be on fire, and from no other cause that could be discovered than the constant exposure for a long time of the wood to heat from the pipes. In this case the pipes were not in contact with the wooden casing, but they were stayed and kept upright by cross fillets of wood which touched them, and these it was which appeared to have taken fire. The small circulating pipes which conveyed the hot water throughout the several chambers, were raised from the floor to about the extent of their own diameter, and the floors showed no signs of fire where the pipes were so removed; but in every case where the prop or saddle which held the pipe up from the floor had been displaced and the pipe had been allowed to sag and touch the floor, the boards were charred. It was understood that the temperature of the water in the pipes never much exceeded 300 degrees.

The Picturesque and the Beautiful.

Among painters Salvator Rosa is one of the most remarkable for his picturesque effects, and in no other master are seen such abrupt and rugged forms, such sudden deviations both in his figures and his landscapes, and the roughness and broken touches of his pencilling admirably accord with the objects they characterise. Guido, on the other hand, was as

eminent for beauty. In his celestial countenances are the happiest examples of gradual variation, of lines that melt and flow into each other; no sudden break—nothing that can disturb that pleasing languor which the union of all that constitutes beauty impresses on the soul. The style of his hair is as smooth as its own character and its effect in accompanying the face will allow; the flow of his drapery, the sweetness and equality of his pencilling, and the silvery clearness and purity of his tints, are all examples of the justness of Burke's principles of beauty. But the works even of this great master show us how unavoidably an attention to mere beauty and flow of outline will lead towards sameness and insipidity. If this has happened to a painter of such high excellence, who so well knew the value of all that belongs to his art, and whose touch, when he painted a St. Peter or a St. Jerome, was as much admired for its spirited and characteristic roughness as for its equality and smoothness in his angels and Madonnas, what must be the case with men who have been tethered all their lives in a clump or a belt? There is another instance of contrast between two eminent painters which confirms the alliance between roughness and picturesqueness, and between smoothness and beauty, and shows, in the latter case, the consequent danger of sameness. Of all the painters who have left behind them a high reputation, none perhaps was more uniformly smooth than Albano, or less deviated into abruptness of any kind; none also have greater monotony of character; but, from the extreme beauty and delicacy of his forms and his tints (particularly in his children) and his exquisite finishing, few pictures are more generally captivating. His scholar, Mola (and that circumstance makes it more singular) is as remarkable for many of those opposite qualities which distinguish Salvator Rosa, though he has not the boldness and animation of that original genius. There is hardly any painter whose pictures more immediately catch the eye of a connoisseur than those of Mola, or that less attract the notice of a person unused to painting. Salvator has a savage grandeur, often in the highest degree sublime; and sublimity in any shape will command attention. But Mola's scenes and figures, for the most part, are neither sublime nor beautiful; they are purely picturesque; his touch is less rough than Salvator's; his colouring has, in general, more richness and variety; and his pictures seem to be the most perfect examples of the higher style of picturesqueness, infinitely removed from vulgar nature, but having neither the softness and delicacy of beauty nor that grandeur of conception which produces the sublime.

Pagan and Christian Catacombs.

The object of the heathen excavators was simply utilitarian; they wanted stone or sand, and they wanted as much of it and with as little difficulty as possible; the object of the Christian excavators was utilitarian also, but of another kind; they wanted places for burying their dead, and places of assembly for the living; but they were hampered with a very troublesome condition—the necessity of concealment. Their modes of operation, therefore, would be altogether different; the ordinary sandpits and quarries would be as near the surface of the earth as the sand and stone could be found; their roads would be as wide and as high as the nature of the rock would permit; and they would have as many entrances to the highroads or open fields as was compatible with the due preservation of the soil for its proper agricultural produce. The Christians, on the contrary, would avoid a multiplicity of entrances, would economise their space and labour by having narrow paths, and would employ every available mode of concealing their works altogether. And these opposite characteristics are so indelibly impressed upon the excavations in the neighbourhood of Rome, that it is scarcely possible to mistake those of one class for those of the other. A visit to the catacombs of St. Agnes brings before us specimens of both; and with this favourable opportunity of comparing their differences, the contrast cannot fail to be striking even to the most careless observer. The sepulchral ways of the catacombs do not average the width of an English yard (not more, in fact, than 2 feet 9 inches); those of the sand-pit, on the contrary, range from 10 to 16 or 17 feet, offering an easy transit not only to slaves and beasts of burden, but even to carts, that might be employed in the extraction of the sand; and the roads of a subterranean stone quarry are often ten times as wide as this; owing to the greater solidity of the material. The galleries of the catacombs are straight and regular, both for economy of space and for the convenience of sepulture, which, in the irregular and serpentine roads of the arenariæ, would scarcely be practicable; their walls too, that is, the natural sides of these galleries, in the catacombs are always perpendicular, and in no other way could the soil be made to bear a number of corpses laid in horizontal shelves, one over the other, and each shut up in its place with heavy tiles or marble; the passages of the arenaria, on the other hand, have no upright sides at all, but the arch of the roof springs from the very ground, so that, supposing two graves to be excavated, one above the other, the outer edge of the upper one must fall for want of support.



QUEEN'S HOTEL, OL

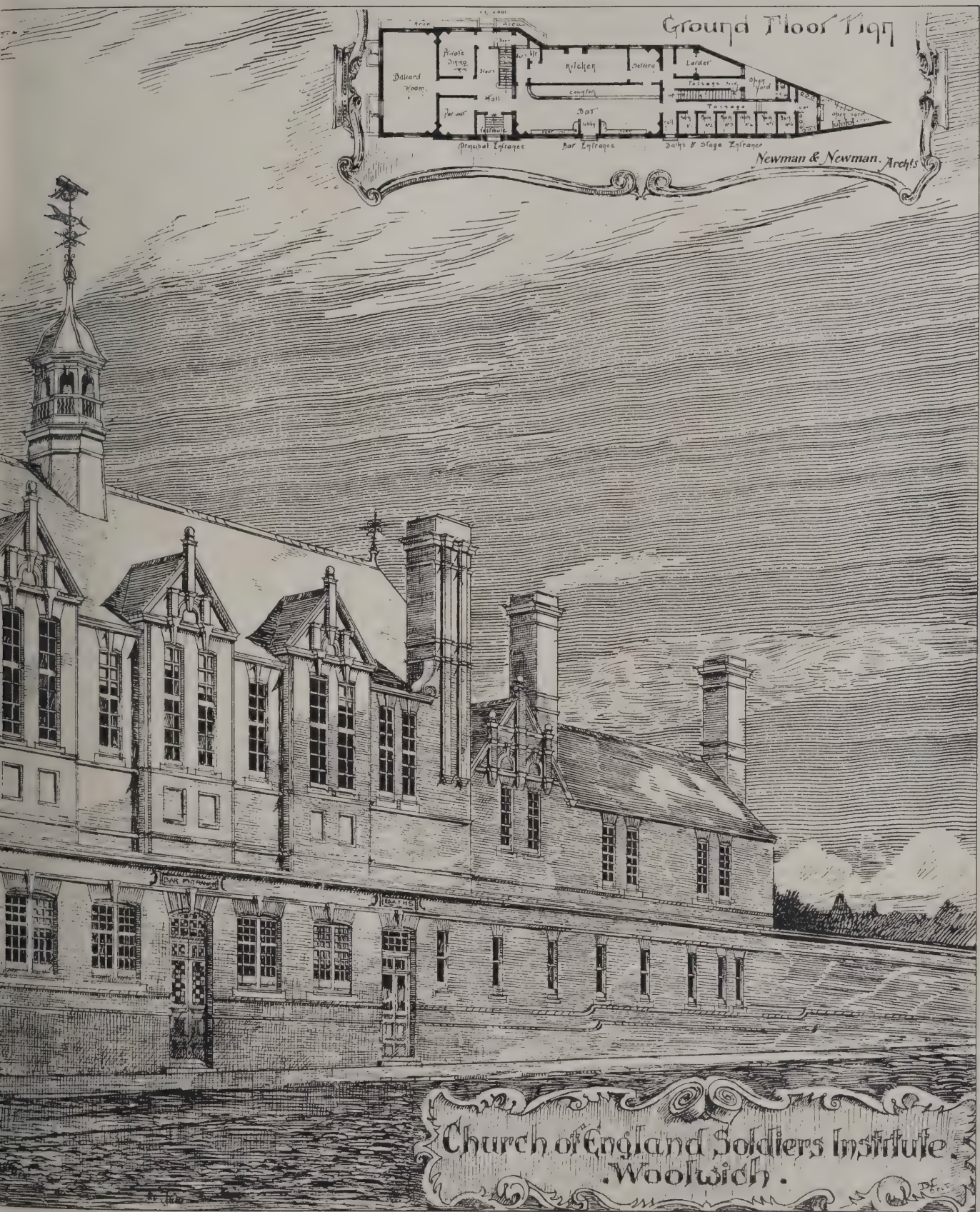
Messrs. J. W. & R. B.



IN A PHOTO SPRAGUE & CO. 42, EAST HADON. PETER LANE



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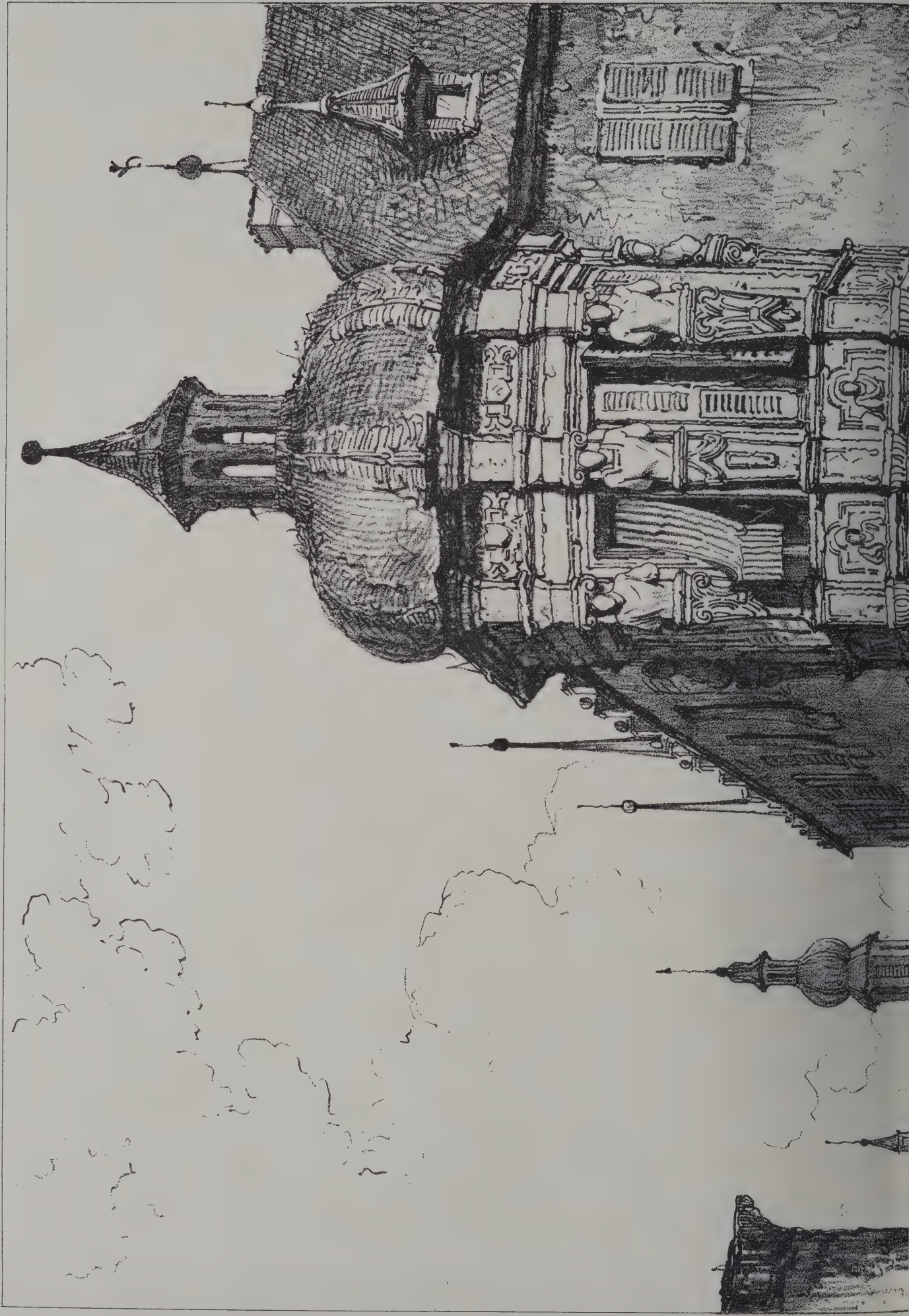




PHOTO-LITHO. SPRAGUE & CO. 4 & 5 EAST HINDING STREET, FETTER LANE, E.

WURZBURG.
Drawn by SAMUEL PROUT.

ILLUSTRATIONS.

THE QUEEN'S HOTEL, OLD COLWYN, DENBIGHSHIRE.

THE Queen's Hotel, Old Colwyn, was built by Mr. GEORGE NAPIER on the estate belonging to the Old Colwyn Land and Building Company. The hotel contains large dining-room, drawing-room, smoke-room and billiard-room on the ground floor, and a large number of bedrooms and sitting-rooms on upper floors. The site is on the side of the hill, and commands excellent views over the sea and along the coast towards Llandudno and Penmaenmawr. The work is carried out on the street base to level of ground floor and above with Ruabon facing bricks; the upper storeys are constructed with timber facing filled in with cement panels, and the roof is covered with red tiles. The architects are Messrs. J. W. & R. F. BEAUMONT, of Manchester.

CHURCH OF ENGLAND SOLDIERS' INSTITUTE, WOOLWICH.

THE illustration we publish this week is of the new Church of England Soldiers' Institute, now being erected at Woolwich from the designs of Messrs. NEWMAN & NEWMAN, of 31 Tooley Street, London Bridge. The principal entrance opens into the staircase hall, on the right of which is situated the bar, 44 feet by 15 feet, with a separate entrance from the road, and kitchen and servery in the rear; and on the left are two private rooms and a large billiard-room. In the basement the accommodation comprises a large room, 30 feet by 16 feet, to be used for devotional purposes, the secretary's office and the scullery, with lift, larders, stores, &c., together with heating chamber and coal cellar. On the first floor is placed the large concert hall, 54 feet by 26 feet, with retiring-rooms and separate staircase to same at back of stage, and the library, 30 feet 9 inches by 16 feet 6 inches, with music and writing-rooms, are in the eastern end of the building. Eight bedrooms are planned in the attics. The hot baths, lavatories, &c., have been placed in the western portion of building, with a separate entrance to the road. The exterior of the building is faced with red bricks, with red Dumfries stone cills and dressings, and the roof is covered with green Westmoreland slates. Mr. J. BULLERS, of Bermondsey, is the contractor, and the heating and hot-water apparatus is being carried out by Messrs. HAYWARD & POOLE. The total cost of the building will be 5,083*l*.

WURZBURG.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE concluding meeting for the session was held on Monday evening. Mr. J. Macvicar Anderson, president, received the members and visitors, many ladies being present on the occasion, and at 8.30 took the chair in the meeting-room and gave the following address:—

Royal Gold Medal.

The PRESIDENT said:—For the third time it becomes my privilege as your representative to present the Gold Medal which Her Majesty the Queen graciously confers each year on such distinguished architect or man of science of any country as may have designed or executed a building of high merit, or produced a work tending to promote or facilitate the knowledge of architecture in the various branches of science connected therewith. Two years since I was permitted to be the medium of conferring this honour on an eminent English architect, whose name and works are alike appreciated and known by all in the realm of art, Sir Arthur Blomfield. Last year no one who was present on the occasion can have forgotten the venerable Frenchman who accepted from my hands this gift of the Queen or the striking address in which he testified his appreciation of the honour—an address which, as we were subsequently informed, had been perused with no ordinary interest by Her Majesty. It is gratifying to know that the prolonged and active life of M. César Daly is still absorbed in the study of the art to which he has dedicated his powers, and ennobling to find octogenarian energy of such exceptional vigour devoted to the pursuit of a cause so commendable, so irreproachable, and so well calculated to benefit society. I have thus experienced the happiness of presenting this royal gift to an Englishman and

to a foreigner, but when I regard the proceedings in which we are now engaged I feel some difficulty in deciding what is the nationality of the recipient of the Royal Gold Medal in 1893, for the distinguished architect whom it is at once our pride and our privilege to be permitted to honour can scarcely be defined either as an Englishman or as a foreigner. He is no doubt an Englishman in the sense that he speaks the Anglo-Saxon language, but on the other hand he is not an Englishman in the sense that he was born and finds a domicile beyond the limits of the British empire. He is no doubt a foreigner in the sense that the scene in which he has achieved celebrity is not British soil, but on the other hand he is not a foreigner in the sense that his nationality is so intimately linked to our own that we scarcely regard it as separate or distinct. What shall I say, then? If he is not an Englishman, and if he is not a foreigner, there is but one word in our vocabulary that will truly describe his nationality—he is an American. Thus, whatever interest may have been associated with any or all of the forty-five eminent men on whom this medal has been conferred, it is obvious that the present occasion has no parallel, and is indeed unique; for we are about to do honour to a citizen of the great Western Republic, one whose name we are proud to enrol as one of our Royal Gold Medallists, not only on account of high personal and professional merit, but also because he is the first American whose name will appear in that roll-call of illustrious artists. That the selection should this year have fallen on one who has designed the principal building in the great Columbian exposition which attracts the world's sightseers to Chicago at the present moment, and which will hereafter associate the name of America with the most wondrous development that international exhibitions have ever reached, or are ever likely to attain, is, to say the least, a singularly fortuitous coincidence. In honouring Mr. Hunt, in recognition of his eminence and of his works as an architect, we rejoice that we are thus able to pay a graceful tribute to the United States in the person of one of her most distinguished sons.

Mr. Richard Morris Hunt, born in Brattleboro, State of Vermont, in 1828, comes of an old New England family, and is the son of the late Honourable Jonathan Hunt, member of Congress. On his father's death his mother removed to New Haven, and his education was commenced at French's school and continued at the Boston High School and Latin School. In 1843—at the age, therefore, of fifteen—he accompanied his family to Europe and entered a school at Geneva, commencing the study of architecture with Alphonse Darier. From Geneva he went to Paris and studied under Hector Lefuel, entering the Ecole des Beaux-Arts in 1845. On leaving the Ecole he travelled through Europe, Asia Minor and Egypt, and on his return to Paris in 1854 he received from the French Government the appointment of "Inspecteur aux Travaux" on the new buildings uniting the Tuileries to the Louvre. His master, Lefuel, having, during his absence, succeeded Visconti as architect, he was put in charge of the Pavillon de la Bibliothèque, opposite the Palais Royal, and had the honour of making, under Lefuel, all the studies and full-size drawings of that pavillon.

Having thus stored his mind with a knowledge of some of the celebrated monuments of the Old World and acquired practical experience, he returned to America in 1855, at the age of twenty-seven, and spent about six months in assisting the late Thomas U. Walter at the capitol of Washington. He then, at New York, commenced the practice of his profession, to which he has enthusiastically devoted his powers throughout an exceptionally busy and distinguished career.

Shortly afterwards he took an active and a prominent part in founding the American Institute of Architects, a body which now has chapters in various parts of the United States. He succeeded R. M. Upjohn and Thomas U. Walter as president, and subsequently was elected President of the Institute under its reorganised constitution. He was also for several years President of the New York chapter of the American Institute.

Soon after commencing his career in New York Mr. Hunt opened an architectural atelier for students on the French system, thus demonstrating in a practical form the native energy of his mind and the influence which his European studies had exercised. Many of the leading architects in America to-day, such men as Professor William R. Ware, George B. Post, Frank Furness, Henry van Brunt, Charles Gambrill and others, were students in this atelier, and it is natural that Mr. Hunt should feel proud of the eminent position they have achieved, for who will venture to say how much they owe to the teaching and inspiration they received in the first American atelier?

In 1867 Mr. Hunt served as a member of the Fine Arts Jury at the International Exhibition in Paris, in 1876 he held the same office at the Centennial Exhibition in Philadelphia, and in this present year of grace he has served as a member of the Fine Arts Jury of Selection and as President of the Board of Architects at the World's Columbian exhibition at Chicago.

In 1882 Mr. Hunt received from the French Government the decoration of the Legion of Honour, and was elected a

Corresponding Member of the Institut de France in the following year. He is an Honorary Member of the Société Centrale des Architectes Français, and of the Architects and Engineers' Society of Vienna, and an Academician of St. Luke at Rome. He has been highly honoured by Harvard University, the oldest and foremost seat of learning in America, which conferred on him the degree of LL.D., the first ever conferred by that university on an artist. Lastly, we have ourselves the honour of claiming Mr. Hunt as one of our Honorary Corresponding Members, and in anticipation of the more intimate relationship we are now about to assume, it may not be uninteresting to note the views which have been expressed on behalf of both the United States of America and France with reference to Mr. Hunt's acceptance of the honour which we are now permitted to be the medium of conferring on him.

From France the President of the Société Centrale des Architectes Français thus addresses Mr. Hunt:—

Paris: le 8 avril, 1893.

Mon cher et honoré Confrère,—Le Bureau et le Conseil de la Société centrale des Architectes français m'ont chargé de vous adresser les vives félicitations de notre Société pour l'honneur si justement mérité que vient de vous conférer l'Institut royal des Architectes britanniques, en vous octroyant, cette année, la grande médaille d'or de la Reine d'Angleterre.

C'est, croyez-le bien, une profonde satisfaction pour nous de voir attribuer cette haute et rare distinction à un architecte que beaucoup d'entr'e nous ont connu, estimé et aimé comme condisciple à l'Ecole des Beaux-Arts à Paris et comme collaborateur d'un de nos maîtres les plus éminents, M. Lefuel.

Nous aimons à penser que c'est un peu l'architecture française qui vient d'être honorée en votre personne en même temps que l'architecture américaine.

En tout cas, c'est de grand cœur que je me fais l'interprète de félicitations, auxquelles je m'associe pleinement, envers un membre correspondant de la Société centrale des Architectes français, envers un artiste à qui son talent et ses mérites ont valu le titre de correspondant de l'Académie des Beaux-Arts.

Veuillez agréer, mon cher et honoré confrère, l'assurance de mes meilleurs sentiments confraternels.

Le Président de la Société des Architectes français, Membre de l'Institut,

H. DAUMET.

In reply to an invitation to be present on this occasion, His Excellency the American Ambassador in London has addressed to the Secretary of the Royal Institute the following letter:—

Embassy of the United States, London:

June 14, 1893.

Sir,—Mr. Henry White, secretary of this Embassy, has acquainted me with the contents of your note to him of the 13th instant, in which, on behalf of the President and Council of the Royal Institute of British Architects, an expression of their desire is made that, as the Ambassador of the United States, I should be present on the occasion of the presentation of Her Majesty's Gold Medal for Architecture to Mr. Richard M. Hunt, of New York, in recognition of his executed works as an architect.

Nothing would be more gratifying to me personally—nothing more gratifying to the people of the United States—than my presence as their representative on an occasion so honourable and of such just distinction to a citizen so eminent in the great profession he has so long adorned.

Of Mr. Hunt's professional skill as an architect, sustained as it is by his personal merits and high character, there is in his own country a consensus of opinion; and to know that his renown has surpassed the limits of his native land, and has met the well-earned applause of the most competent critics of other nations, is a just cause of national pride, which I am sure will be felt when the announcement of the proposed honour to him shall become publicly known in America.

Under instructions of my Government my first duty in Great Britain is the presentation of my credential letter to Her Majesty, and until this shall have been accomplished it would seem proper that I abstain from other acts of an official nature. Therefore I have asked Mr. Henry White, the secretary of this Embassy, to be present as a representative of the Government and people to whom honour is paid when it is bestowed so deservedly upon their distinguished compatriot Mr. Hunt; and I am, sir, most respectfully, your obedient servant,

T. F. BAYARD.

I have referred to these communications because it is pleasant to be thus assured that he whom we delight to honour is held in equally high regard by his compatriots alike in the United States and in France. To describe in detail the work of an architect whose practice has been so extensive and varied entails considerable labour, and it would seem to be superfluous in the present case. Mr. Hunt's principal works, most of which are of Classical design, are characterised by both vigour and purity in composition; and many of them are well known to some here this evening.

I have said enough to demonstrate, were demonstration required, that the recommendation of the name of Mr. Richard Morris Hunt, which we humbly submitted to Her Majesty, is not merely justified by the meritorious works and by the distinguished career of the man, but has been confirmed by the unanimous testimony of those who are best able to judge of his qualifications, both in Europe and in America.

Mr. Hunt, in presenting to you this Gold Medal, the gift of Her Most Gracious Majesty Queen Victoria, I hand you what is the typical embodiment of the recognition by British architects of your distinguished and honourable career, and of the high architectural merit of your works. The fact that you have travelled some thousands of miles in order that you might personally receive this medal may be accepted as sufficient evidence of the high estimation in which you rightly regard the honour. It is indeed the highest which we are graciously permitted to offer to the most illustrious architects of the world, and we indulge the hope that our American brethren will recognise in this royal gift, which we are privileged to present to their most eminent representative, the embodiment of the hearty goodwill, the sincere respect and the ardent admiration with which they are regarded by the architects of the Old World.

Mr. HUNT said it was useless to express how embarrassed he was, for nothing that he could say would fully represent his feelings of gratification, gratitude and thankfulness to the Institute. He had had many honours conferred on him, but the gift of the Queen had a peculiar charm, and being presented by his own *confrères* he accepted it and was proud of it for himself, and also proud of it for his country. In accepting it he did not do so personally, but for the whole profession in America, for so the Americans accepted it, and he also accepted it as a compliment to France. Referring to the works between the Tuileries and the Louvre begun by Visconti, he said Lefuel twice refused to undertake the work, because the architecture of France would not be represented. At last he consented, but on his own conditions as to style and other details. After describing how he and Lefuel conducted the work which had already been commenced, he said he thought he had been too much favoured and had received too many compliments, though it was true he had been forty-nine years at work. Remarking that America was celebrating its fourth centenary, he spoke of the exhibition. Chicago had obtained the privilege of holding it though other States had wished for the honour. He alluded to his work on the buildings there and how he had with the Committee of which he was chairman settled on a style that should be suitably monumental for the occasion. Iron, glass and tile were best suited for exhibition buildings, but the problem how to adapt them in a proper monumental fashion had never been solved. For the first time in America had they introduced painting and sculpture for monumental purposes in a building. Mr. Hunt concluded by a hit at the anomaly of the supervising architect having so much of the building work. The list of the supervising architect a few weeks ago had on it over 300 buildings for erection, and every year millions of dollars were spent on buildings. They had been trying to break up that system.

Mr. HENRY WHITE, secretary of the American Embassy, said it would be superfluous and presumptuous to refer to Mr. Hunt's works, whose name was associated with progress and beauty in architecture. The compliment to Mr. Hunt could only strengthen the chain of interest and sympathy that had grown on him during his nine years in England.

Baron VON GEYMÜLLER spoke on behalf of the Academy of Fine Arts, France.

M. PAUL SEDILLE excused himself for speaking in French. He said French architects were proud of their *confrère* Mr. Hunt, who had transported across the Atlantic the delicacy of their art. Art had no limit as to country. Art belonged to all ages. He admired the English works, an admiration which was shared in by the bulk of his compatriots. What was suitable in England might not be suitable in France, and *vice versa*.

The formal business then terminated, and the assembly repaired to the east gallery to listen to the band.

GEOMETRY IN DESIGN.*

IN presenting this Society with some illustrations of geometry in design, the author has given to the word "design" a somewhat wide meaning, and yet a meaning which, he ventures to think, it may legitimately bear. For he conceives that the process of designing involves the determination of the plan or section; the composition and outline of the elevation; the form—whether determined from scientific or from aesthetic principles, or from both—of the various structural details, before we come to the more limited question of ornament. The author ventures to think that, regarding the word "design" in this, its accurate sense, he has kept within the limits which nomenclature imposes.

In considering this subject one could not but remember a remarkable canon of a remarkable authority, who says:—"I would insist especially on the fact that all most lovely forms are directly taken from natural objects; because I would fain

* A paper read by Mr. H. A. Saunders, M.A., at the meeting of the Society of Architects on Tuesday, Mr. A. E. Stoner, member of council, presiding.

be allowed to assume also the converse of this, namely, that forms which are not taken from natural objects must be ugly." And yet there is a peculiar interest and pleasure; and therefore, it may be, also beauty, in geometrical design arising from its being an adaptation of forms which have existed from an indefinite period, whose properties are necessary adjuncts of space, or at least of such space as we can conceive of, and of which, ultimately, we can justly say that they have not been invented but discovered. Some of them, it is true, appeal to us because of their familiarity. Mr. Ruskin himself speaks of the circular arch as suggestive of the expanse of heaven, and of the pointed as reminiscent of the natural shape of the leaf. But there appear to be others whose beauty depends on their subtlety, as, for example, the delicate curves of Greek art; others again which, like the diapers and interlacings of Moorish and Saracenic art, delight us by their wonderful ingenuity; while other geometrical forms, while not presenting the same complexity are, to say the least, highly recommended to our notice by their associations or symbolical interest.

There are, of course, many forms which combine the natural in a greater or less degree with the geometrical, and to which, perhaps, the title of "geometrised natural" might be assigned. The earliest examples of such class, or, indeed, of geometrical design in any sense, are probably to be found in the splendid range of temples, tombs and monuments on the banks of the Nile. For although among the Egyptian ruins the natural types from which the form is evolved are sufficiently evident, yet in many cases careful investigation has disclosed a more or less strict geometric law, to which the design has been conformed, and the discovery of which has revealed to us a degree of scientific knowledge among the Egyptians of 1,500 years and more before Christ which was probably never exceeded after the Greek era until as many years of the Christian dispensation had elapsed.

We have two forms of papyrus column in which the stem appears in the shaft and the flower or bud in the capital, and which, on close examination, speak volumes for the knowledge and accuracy of the Egyptian designer. These columns are derived from the single papyrus stem. Though they are circular (and the papyrus stem, as we have seen, of the form known architecturally as the spherical triangle), yet they retain, it is believed, in almost every instance vertical lines on the shaft, the trace of which on any horizontal circular section gives the angular points of the inscribed equilateral triangle.

This alone would be sufficient for identification if the general form were not so close a copy of the natural object. Yet by measurement and investigation it becomes soon apparent how completely "geometrised" the form has become in the hands of the architect.

And here, before proceeding further, the author will show some slides illustrative of some of the forms and properties of the conic sections.

Turning now again to our papyrus pillar of the species in which the capital represents the unopened bud, and which is well shown on the left of the view of the east gate of Memnonium, we have first to notice that the dimensions of the parts are found to be simple fractions of the height of the column, so that the height regulates the proportions of the whole in a manner not, indeed, destructive of individual treatment, though originality certainly received but scant courtesy in ancient Egypt, but sufficient, at least, to indicate generally accepted rules of simple commensurability. In an instance of this class, taken from the temple of Medinet Habou, on the west bank of the Nile, at Thebes:—

Width of abacus = one-fifth of the height of column = 6'094 feet.

Width of abacus or height of column = 6'094 feet.

$\frac{10}{10}$ or $\frac{50}{50}$ Of these latter parts, each = 6'094 feet (fiftieths).

4 parts = height of base = height of abacus = 2'437 feet.

12½ parts = height of capital = 12½ = 7'6175.

15 parts = width of capital = 15 = 9'14.

But, in addition, while the base is in many cases a zone of a sphere, or of a sort of "millstone shape," and the capital is apparently formed by superposing a segment of a cone on a portion whose vertical section gives a circular trace, the profile of the shaft has been shown to be a hyperbola, whose vertex is at the junction of the shaft and the base. But, more than this, the foot of the ordinate of the point where the profile of the shaft meets the capital is distant from the vertex ten times the length of the semi-transverse axis of the curve. And not only this, but remembering, of course, that a vertical section through the axis would show two profiles, the ordinate to the hyperbola through the same point appears to cut the section of the capital (on the same side) in the point where the circular curve in the section of the lower part of the capital (or base of the unopened bud) runs into the generating line of the cone by which the upper part of the bud is represented.

This evidence of careful design and mathematical knowledge on the part of architects who flourished at least 2,500 years ago is a matter of singular interest among the numerous

examples of a civilisation which was already at its zenith when Abraham went down into Egypt, and when Moses was educated "in all the learning of the Egyptians."

The species in which the capital conventionally represents the blown flower has similar geometric properties, and is of particularly graceful contour. These are well shown in the view of the Great Hall at Karnak. They varied in size, the inner chambers of Egyptian temples being less lofty than the outer; but it may be of interest, as helping us to realise the scale on which much of the Egyptian work was produced, to recall Kenrick's observation, that "it would require six men with extended arms to embrace the circumference" of some of the larger columns in this temple.

The Egyptian entablatures were simplicity itself compared with the complicated suite of mouldings which crowned the Greek temple. They consisted in some cases of a plane corona, a soffit of hyperbolic section, a moulding of elliptical profile and a plane architrave. The hyperbolic curve of the soffit is here of smaller eccentricity, and with its transverse axis at right angles to the line joining the edge of the corona to the angle of the elliptic moulding, which latter also supplies proof that the Egyptians were acquainted with another conic section.

Segments of circles have been found in the roofs of various sepulchral chambers, and in one case at least an example of a false ellipse struck by circular arcs drawn from three centres.

But one of the most interesting discoveries in connection with the mathematical planning of a sepulchral chamber has relation to the tomb of one of the governors of Southern Egypt in a sepulchral grotto at Beni-Hassan, between Minieh and Thebes. In the plans of most of the tombs some simple proportion connects the length, breadth and height. For instance, in the tomb of Sethos I., discovered by Belzoni, the height and breadth are each 11-18ths of the length, and the author believes that the symbolical form of the double square occurs not infrequently. But in this particular instance commensurability has been departed from in order to give to the length, breadth and height the somewhat unusual ratios of $\sqrt{5} + 1 : 2 : 2$. Unusual at first sight, and yet when stated in this form recalling the geometrical construction for the size of 18 deg., and thence the process for dividing a line in extreme and mean ratio. In fact the length, breadth and height are arranged in such a way that the length is equal to the sum of the breadth and the height, and at the same time the rectangle contained by the length and the height is equal to the square on the breadth. Here then we have an example of the knowledge of a proposition of Euclid probably twelve centuries or more before Euclid's time, and a glimpse of the antiquity even in his days of the discoveries which he embodied in his immortal compilation.

The forms of Egyptian architecture and ornament which were adopted and adapted by the Greeks are many. Egyptian frets are in many instances almost identical with the familiar Greek pattern. The more or less irregular star pictures on blue grounds in the roofs of Egyptian tombs are reproduced with artistic developments in the square panels of the Greek temples—notably of the Erechtheum. The peripteral arrangement, too, of the columns, though the author believes it has been regarded as essentially Greek, yet seems perhaps to have had a prototype in the columned ways surrounding many of the Egyptian temples, though in these cases the shafts sprung from or were enclosed by a wall surrounding the building, as, for example, in the case of the small temple at Philæ, known familiarly as Pharaoh's bed, and in another instance on the adjacent island of Elephantina. But if this be doubtful the fluted column, supposed by some to have been suggested by the striated bark of the unshaped posts supporting the early Greek hut, has what appear to be undoubted prototypes among the Egyptian ruins. Of these the well-known examples of proto-Doric columns at the entrances to grottoes at Beni-Hassan already referred to are among the most interesting. But we have not the flute. The capital, with its projecting square abacus and simple echinus is distinctly suggestive of the Doric order, and though the eight (or in some cases sixteen) faces of the shaft are not fluted, but merely plane (so that the section is a regular polygon of eight or sixteen sides), the general effect points to them as the original of the columns of which the Parthenon supplies the most perfectly developed specimens. These columns are of great antiquity, and are usually referred to a period of about 2000 B.C.

The author has also been able to secure a view of columns of remarkable section in which the flute actually occurs. These are obtained by fluting all the column with the exception of four vertical bands, symmetrically placed, on which the original curved surface of the column remains. So far as the author has been able to discover, the sections of the flutes are of segments of circles. In number they vary, specimens at Thebes exhibiting six and three in each group. To those at Thebes are assigned the date 1600 B.C. The example shown is from Kalabsee, and the ancient Talmeo, in Nubia.

During what period the Greeks were more or less subject to Egyptian influences it would be impossible to say. In the Mycenaean sepulchres Dr. Schliemann discovered bronze swords ornamented with the papyrus, bearing great resemblance to Egyptian work, and more particularly to a dagger discovered in the coffin of one of the queens of the Eighteenth Dynasty. We know from Herodotus that the Greeks derived many of their notions of geography—such as they were—from the Egyptian priests; and it seems extremely probable that they inherited a richer legacy of mathematical knowledge from the same source. Further investigations may discover additional proofs of Egyptian knowledge, but as far as we know at present it would seem that the torch handed down to the Greeks by the Egyptians burnt brighter in the hands of its new bearers.

Returning to the subject of the Egyptian temple for a moment, in order that one may point out the central line of approach entered through the massive Pylon, and marked by an avenue of sphinxes and obelisks by which it was reached.

With this we may compare the Greek plan as illustrated by the approach to the Acropolis. The Athenian approached this storehouse of his country's artistic—and scientific—wealth by a winding road which led him to the impressive Propylæa, suggested it may well be by the Egyptian Pylon. Passing through this stately entrance he reached the summit of the sacred rock which overhung his city, and was led by a road marked by statues and monuments to a point whence he viewed from below and angularly the most imposing—if not in all respects the most perfect—of the shrines of his deities, the temple sacred to the protectress of the commonwealth—Athene.

Now the Athenian architect built with the intention, not that the building he designed should conform to his own notions of beauty and symmetry, but that the effect it produced on the observer should be the embodiment of his conceptions. His measurements and proportions are embodied in the stones of the building; his ideas can only have been thoroughly and exactly realised by the observer gifted with the capacity of appreciating to the full what was delineated on his own picture plane.

So, although the subtle beauty of the columns and the sculptures of the pediment must have first struck the eye, we will pause for a moment to consider a point apparently of small importance, but not so small, evidently, as to escape the care of the Greek artist in his endeavours to attain perfection.

We have sufficient historical testimony to the fact that to the Greek eye a prolonged straight line gave the impression, not of a straight line, but of a curve hollowed out towards the middle. But if we had not known this we might have been puzzled by what has been revealed to us by the careful measurements to which the Parthenon, the Theseum, and other porticoes have been subjected. In the 101 feet of the stylobate on the east front of the Parthenon, the centre of the step rises to a height of nearly $2\frac{3}{4}$ inches, while on the return side in 228 feet the rise is $4\frac{1}{4}$ inches as nearly as possible; and by comparison of intermediate ordinates it has been shown that the curves of the steps are probably arcs of circles. This being assumed, the radius of the circle of which the line of the step is an arc is found to be about a hundred yards more than a mile, while the radius of the corresponding curve in the Temple of Theseus is about two miles and a half. Knowing what we do of the history of this subject, we are yet at a loss to account for the exact principles on which the form and curvature of this line were determined, and when we consider that the rise is equivalent to something less than 1 in 200, it seems remarkable that such nicety of curvature should have been appreciated. Yet the occurrence of a similar optical correction in the Theseum, the Temple of Jupiter Olympus, and elsewhere, except in the case of very small structures, shows that it was an essential geometrical principle of design.

Very analogous to this is the question of the entasis of the column. We may note, in passing, that the extreme or angular columns were designed from 1-40th to 1-50th larger in average diameter than the rest, in order that the play of light around them might not make them appear more slender than their companions. So, too, that the columns might not appear of concave or, as it were, dice-box profile, the centre of the shaft had a greater diameter than it should have had according to the simple proportion which would have determined it if the form had been that of a frustum of a cone. What was the law which governed this entasis is a matter which has given rise to much discussion, and been decided in different ways by different authorities.

The curves which appear to approach most closely to the actual curve of the shaft, so far as can be determined, are hyperbolas. But the extreme delicacy of the changes in curvature, and difficulties of measurement, make the question one of great intricacy. The results obtained seem to point to the curve of profile, in the case of the Doric column of the

Parthenon, being an arc of a hyperbola, whose vertex, if the curve were prolonged, would occur at a distance of two diameters, measured at the base of the column below the level of the upper step. The rectangular axes of the curve are vertical and horizontal; the eccentricity is calculated to be 30·1, and the radius of curvature of the hyperbolic section at the base of the column has been determined to be five times the length of the building, or over 1,200 feet. Practically, in fact, the lower part of the profile may be taken to be a straight line for some little distance up the shaft, but not a straight line parallel to the axes of the column, but inclined inwards at an angle which corresponds roughly to a rise of 1 in 200.

In this connection we have a very interesting distinction between the columns of the Parthenon and the Ionic columns of the Erechtheum and the Propylæa. In these latter cases there appears to be no doubt about the nature of the curve. The vertex, or point of maximum curvature, occurs in these cases as nearly as possible in the centre of the shaft. If it were exactly in the centre the tangent at the vertex would be, of course, parallel to the chord of the whole arc employed. This is nearly the case, and as a consequence of the diminution of the diameter of the column the axes are no longer vertical and horizontal as in the former case.

(To be continued.)

BATH PUMP-ROOM EXTENSION SCHEME.

AT the meeting of the Bath Town Council, as reported by the *Argus*, the following report was read from the Baths and Pump-room Committee:—

On March 8, 1892, the Council adopted a report of your committee sketching the general features of proposed increased accommodation in connection with the Grand Pump-room, and authorised an application to the Local Government Board for their sanction to a loan of 6,000*l.* for the purchase of Nos. 2, 3 and 4, Abbey Churchyard. A memorial was presented to the Local Government Board, and an inquiry was held by Mr. S. J. Smith, C.E., one of their inspectors, on June 14, 1892, and on September 27, 1892, the Town Clerk reported to the Council that the sanction had been obtained. On November 9, 1892, the Council, upon the recommendation of your committee, accepted the tender of Messrs. Jacob Long & Sons for excavating the site down to the level of the Schola of the Roman Bath, amounting to 550*l.* The excavation being now complete, the time has arrived for taking the next step for the accomplishment of the scheme, and your committee recommend that the surveyor of works to the Corporation (Major Davis) be instructed to prepare and submit to the Council a plan and design for the utilisation of the site adjoining the Roman baths.

Mr. Radway (chairman of the Baths Committee) said it had been his custom to move the adoption of reports from his committee, but on this occasion he was not in touch with the committee, and declined to vote when the report was brought before the committee, and carried by nine votes to eight. He reserved to himself the right of free expression, and called upon Mr. Ricketts to move the adoption of the report.

The Mayor suggested that the Town Clerk should read what was done under similar circumstances in connection with the municipal buildings scheme.

Mr. Ricketts submitted that the baths scheme was not on all fours with the municipal buildings.

The Town Clerk was about to carry out the Mayor's suggestion, when Mr. Ricketts proceeded with his remarks, but was interrupted by the Mayor, who urged upon the Council the importance of having before them what was done under similar circumstances in connection with the municipal buildings.

The Deputy Town Clerk (Mr. B. H. Watts) having read the minutes referred to, deciding that there should be competitive designs,

Mr. Ricketts rose to move the adoption of the report. He said because the Council adopted a certain course in regard to the municipal buildings they were not called upon to follow a similar course with reference to the baths. Having been called upon by the action of Mr. Radway to move the report, he would tell the Council how the whole thing came about. He was summoned to attend a special meeting of the Baths Committee, and found the table covered with plans which Major Davis had been requested to prepare. Questions were asked as to how Major Davis proposed to utilise one corner, the line he would bring the building out to, its height, &c. It occurred to him (Mr. Ricketts) that they were taking a false position by adopting such a scheme, and he inquired whether Major Davis had been instructed to prepare plans for the utilisation of the site. Learning he had not, he requested Major Davis to leave the room, and subsequently his resolution authorising Major Davis to prepare plans for the consideration of the Council was carried. That resolution was before them that day. It appeared to him (Mr. Ricketts) that the surveyor of works had considerable claims upon the Council with regard to the baths. It was a well-known fact

that Major Davis had for years paid very great attention to the baths, and it would not be denied that to his efforts to a great extent was due the present position of the baths. The baths were advertised as the most perfect in Europe, and that the Corporation had expended 40,000*l.* upon them. That advertisement was perfectly true, and to whom was this state of things attributable? Major Davis had by his energy brought the baths to their present state of efficiency, and they were indebted to him for the discovery of the Roman remains. He thought Major Davis ought to have the credit of that. A well-known member of the Council, referring to these baths, said for size, excellence and mechanical appliances they compared most favourably with any baths in Europe, and also, he went on to say, that the mechanical appliances were superior to any others. Taking it first as justice to the ratepayers, they had got a man who found them the finest baths in Europe by their own admission, and yet they wanted to go further and find some one who might possibly be able to give them anything finer than the finest. Then, with regard to the arrangements under which Major Davis was retained, he drew attention to clause 8 of his appointment, in which it was stated he should prepare all plans and specifications, for which he should receive no payment whatever, but for work over that he should receive payment. That clause, he said, although it possibly did not give Major Davis the carrying out of this work, certainly did give the idea that works over 1,000*l.* should be relegated to him. Under these circumstances he thought he had a claim; he had claims upon the Council on the ground of justice, on the ground of gratitude for what he had done for this city, and he thought under the circumstances that Council would do worse than adopt the resolution that he proposed. It was that the city surveyor of works should be called upon to prepare a plan and design, which he had ascertained would not exceed the cost of one hundred guineas provided nothing further was done with it, that it should be brought to the committee and then to the Council, who should do what they liked with it. He thought they might do this. That morning they had voted 178*l.* for an opinion; this was something more than an opinion. There was a very great diversity of opinion as to what they wanted, and he thought they could better settle what they wanted if they had the plan to look at and discuss. If he were Major Davis, and a competition was decided upon, he would not compete.

Alderman Commans seconded the adoption of the report. He considered that during the past twenty years no man had rendered the service to the city, the benefits to the baths and the usefulness to the waters that Major Davis had, and he thought the opposition was unjust, unkind and uncalled for. Was there any other man who had the knowledge of the requirements for internal arrangements that Major Davis had?

Alderman Gibbs rose to move an amendment, and at the outset denied Mr. Ricketts's statement that outsiders were of his opinion. The expressions of dissatisfaction that he had met with from all classes had been quite the other way. In his opinion Alderman Freeman had done a great deal more than Major Davis ever did in making the baths known. It seemed to have been lost sight of by those who spoke of Major Davis as the originator of the appliances, &c., that it was the late Dr. Burne, father of Mr. Holland Burne, who first pointed out that the drinking of the waters and the bathing constituted only a portion of the proper treatment, and he particularly referred to the mechanical treatment with appliances adopted at places on the Continent. There were a great many heads of objection to Major Davis. In the first place his dilatoriness. They rarely had things brought up in time to give them full and fair consideration; they were mostly brought up at the last moment. He ventured to say that no man of business would be satisfied to place such an important work as this in the hands of anyone who had discharged his duty in the perfunctory manner in which Major Davis had discharged his. Alderman Gibbs was proceeding in this strain, when

Mr. Lewis rose to a point of order. It seemed to him, he said, to be a personal attack upon Major Davis.

Alderman Gibbs explained that the other speakers had spoken of Major Davis in a personal sense, and he was giving an opinion from another point of view.

Mr. Ricketts said Alderman Gibbs had often told them not to speak of a question of order. He had stopped him (the speaker) more than once.

Mr. Lewis thought it was unfair and cruel.

The Mayor said: So far as I could catch Alderman Gibbs's observations they were to this tendency, that whereas the mover and seconder have shown why he should be employed, he has shown why he should not be entrusted to do this work.

Alderman Gibbs proceeding, said there were a great many points, but he would not trouble the Council further. Major Davis's dilatoriness, his absence at times when he was wanted, his disregard of the directions of the Council—any gentleman who authorised the erection of the screen for the Pump-room, let him say so. It was notorious that he did it out of his own head—that it was never authorised. He not only disregarded

the committee but he defied them. Having dealt with Major Davis's conduct in other matters, Alderman Gibbs moved as an amendment, "That advertisements be issued as in the case of the plans for the new municipal buildings, inviting architects to send into the Town Clerk competitive plans for the work which might be arranged by the Town Council on the site proposed by the Baths Committee, such works to be carried out under the superintendence and conduct of the successful candidates on the usual terms of remuneration, and that quantities be taken out by a disinterested and competent person from London, and that Mr. Brydon be asked to assist the Council in the matter."

There was no seconder to the amendment.

Mr. Radway said he deprecated in the strongest manner any personal allusion either to the ability or the want of ability, if such existed, of Major Davis. He wanted the question to be dealt with on a broad and businesslike principle. He gave to Major Davis much of the credit that had been assigned to him, but to say that to Major Davis the present prosperity of the city was to be attributed was saying something that was not absolutely true. He asked for a dispassionate consideration of the question. They were about to enter upon an important epoch in the city's buildings, and they were hopeful that it would bring people to Bath and enhance its prosperity. If they asked him to consent to shut Major Davis out of the competition for designs, he answered he was not with them, but he asserted that Major Davis did not possess the whole of the architectural knowledge of England, neither could he claim to be a specialist. His amendment was that the Council advertise for premiated designs, offering premiums of 100*l.*, 75*l.* and 50*l.*, and that the Society of British Architects be asked to nominate a gentleman as assessor. He asked that Major Davis should not be debarred from competing. If his friends said he was afraid to compete, it was the strongest argument that they must go further afield. He was asking for a simple matter, that the brains of England should be at their disposal. They might have a dozen or less designs sent in, but when they had them, then, with the aid of a competent assessor, they would certainly get the best money's worth. Mr. Radway was proceeding to speak of Major Davis's share in the competition, when

Mr. Ricketts said Major Davis would not compete.

Mr. Radway thereupon asked whether they were so left to the mercy of one of their officers that he said he would not compete, but preferred to run the gauntlet and force upon the Council his views and his views only, whether they were to the interest of the city or not? He did not believe that was the spirit in which Major Davis intended to act, but it strengthened his (Mr. Radway's) hands in asking for a competition of architects.

Alderman Jolly seconded the amendment, and asked what would be the result of adopting such a proposal as Mr. Ricketts had made, viz. that Major Davis should have the entire control of the designs? Who would advise the committee in arriving at a decision that required technical assistance? Major Davis was the legitimate adviser of the Baths Committee, and he (Alderman Jolly) regretted to say he had received a note from him that morning in which he absolutely declined to act as assessor.

Mr. Ricketts asked for the letter to be read.

Alderman Jolly said it was a private letter. He had a private conversation with Major Davis the previous day, and that morning he received a note from him urging his claims for appointment.

Mr. Ricketts: Does not he ask you to read it to the Council?

Alderman Jolly answered in the affirmative, adding, however, that it was a private letter. He asked the Council to act as they did in the case of the municipal buildings, feeling sure it would be satisfactory at all events to those who had any responsibility in the matter.

Alderman Chaffin supported Mr. Ricketts's proposal, and claimed that Major Davis was capable of fulfilling all requirements in this matter. In the municipal buildings there was a freedom of design; in this case the architect's hands would be tied, and the elevation was bound to be a continuation of the present Pump-room, the architecture of which was elegant, beautiful and Classical.

Mr. Sturges spoke in favour of Mr. Radway's amendment.

Mr. Moore said there could be no harm done in asking Major Davis to draw up plans for utilising the site at a cost of about 100 guineas. The Council need not accept the plan, but they would have the benefit of Major Davis's experience. He (Mr. Moore) was quite sure he would not compete, and he did not blame him for taking this course.

Mr. Chivers asked to be made acquainted with the terms of agreement between the Corporation and Major Davis.

The Town Clerk produced the agreement, which bore out what Mr. Ricketts had said on this point.

Mr. Chivers said according to this they were not obliged to give Major Davis work above 1,000*l.* He himself could see

how valuable it would be to go further afield and get the best experience they could.

Mr. Eaton Young said the Council were not capable of deciding whether a plan and design by Major Davis were the best for the purpose. The Council could not arrogate to themselves to be censors of the canons of architecture, and this made an assessor absolutely necessary. Anything like the course proposed would simply be throwing away 100 guineas.

The Mayor said the Council were aware that it had not been his custom to give a vote on matters on which there was likely to be a sharp division, but he could not refrain from doing so that day because he thought a very important principle was at stake, a principle which had been deliberately adopted by that Council, and acted upon with considerable advantage. The principle referred to was that of throwing open the competition for the plans, and he pointed out how successfully it acted in connection with the new municipal buildings. It had been urged, he continued, that they ought to throw aside this principle because Major Davis had done so much for the baths, but was Major Davis the architect when the first new baths were erected? Was it not to the prosperity of these baths that success was due? He pointed out that Major Davis was not the architect then, while the second erection for which he was responsible was, to his mind, full of faults. It was anything but an ornament to the city. They could not, he considered, have full confidence in Major Davis. If he had the sole control of this thing, if he brought forward a plan without any competition, then, he felt, they would be at his mercy, and he appealed to them whether they could sufficiently trust Major Davis in a matter so important.

Mr. Radway wished to explain that he had no feeling against Major Davis, and he had during the last few hours done everything to get Major Davis to come into the scheme and act as assessor. He now deliberately and positively said he would not accept that position.

Mr. Lewis asked whether Major Davis did not get the first premium when the baths adjoining the hotel were built.

It was stated that this was the case, but that the second design was carried out by the committee.

Mr. Radway said Mr. Lewis was quite right. Major Davis got the first prize, but the cost was so great they could not consider it.

Mr. Ricketts, replying, urged that it was due to Major Davis that a chance should be given him of perfecting the work which he had commenced.

The amendment was then put to the meeting, and carried by a majority of nine votes, the original motion being lost.

THE LATE JAMES MACLAREN.

MR. JAMES MACLAREN, the respected head of the well-known firm of Messrs. James Maclaren & Sons, architects, Bank Street, Dundee, died suddenly and under peculiar circumstances, the *Dundee Advertiser* of the 19th says, on Friday evening, at Kingskettle, Fife. Mr. Maclaren was present at a meeting in the Public Hall there, held under the auspices of the East Fife Liberal Organisation, and had not long resumed his seat, after speaking in support of a motion expressive of continued confidence in Her Majesty's Government and in Mr. Asquith, when he was seized with sudden illness. He was immediately removed to the anteroom of the hall, where everything possible was done to render him relief. All efforts, however, proved useless, and Mr. Maclaren expired in the course of a few minutes. Meantime, Drs. Butters and Laidlaw, Ladybank, were hastily summoned, but death had taken place before their arrival. The cause of death is thought to have been apoplexy or affection of the heart. The remains were removed to the house of Mr. Hogg, corn merchant, and subsequently conveyed to Ferrybank.

Mr. Maclaren was born in Dundee upwards of sixty years ago; he served his apprenticeship as an architect in the office of Mr. Smith, Reform Street, and thereafter was employed in succession with Mr. Johnstone, surveyor, Edinburgh, and Mr. David Bryce, R.S.A., Edinburgh. While engaged in the capital he was successful in gaining the Soane Prize Medallion, one of the most highly coveted of architectural honours, his design being one suitable for public baths. At an early age he started business, first in partnership with his brother William and afterwards on his own account, in Reform Street, Dundee, and during a long career has been very successful. Among his first architectural works were the designs for the Forfar Prison and the Peel Monument, Forfar. He was the architect for many buildings, both public and private, in Dundee, and, besides, he has erected buildings in all parts of Scotland. It may be mentioned that, among many others, he designed Lamb's Hotel, the offices of the Northern Assurance Company, the Messrs. Cox, Messrs. Don Brothers, Buist & Co., Calcutta Buildings, and Russell Chapel, Dundee; Lochee U.P. Church; Ryehill U.P. Church, Dundee; Queen Street U.P. Church, Broughty Ferry; the Congregational Church, Broughty Ferry;

Barry Free Church; Arbroath Public Hall; Balthayock House, Ashludie House, Clement Park, Convalescent Home (Barnhill), &c. A number of years ago Mr. Maclaren took up his residence at Ferrybank, Cupar Fife, and until the last was in the habit of coming daily to his place of business in Dundee. Despite the heavy exactions which his professional duties entailed, deceased found time to devote to furthering the interests of the county in which he had taken up his residence. He was an energetic county councillor for the Cupar Fife district, a J.P. of the county of Fife, and a member of the Lunacy Board. He was also a director of the Dundee Tramway Company since its commencement. During the whole of his life Mr. Maclaren evinced a strong taste for literary pursuits. He was editor of the *Building Chronicle*, an architectural journal published for a few years in Edinburgh, and of the *Angus Magazine*; he contributed leading articles to the columns of the *Northern Warder*; and he was editor of a republication of the "History of Dundee," written by Mr. James Thomson. He was, moreover, a frequent contributor upon architectural and agricultural subjects to the columns of local publications. His wide experience in railway business made him a much sought-after witness in arbitration cases, one of his latest appearances in that capacity being in the arbitration regarding the value of the Princes Street Gardens, Edinburgh. A man of the most genial and amiable disposition, Mr. Maclaren's sudden death will be mourned by a wide circle of friends. He leaves a widow and a grown-up family of sons and daughters. On Saturday deceased's family received a telegram from the Right Hon. H. H. Asquith, M.P., the home secretary, expressing sincere sympathy with them in their bereavement.

AMERICAN SILVERWORK.*

By H. TOWNSEND.

WHILE I felt not a little honoured by the request which was made to me a few weeks ago in this place, so redolent of the memories of men famous in art and letters, I felt more than usually diffident at the prospect of displaying my own shortcomings. However, I can only trust that the interest of the subject upon which I am to speak will outweigh the obvious unworthiness of the speaker. Indeed, if I succeed in carrying out my own intentions I shall appeal to you, not so much through my own inherent virtue of eloquence, as by being the means of a display of that virtue in others.

I am going to talk to you to-night about the silverwork of America, and it will not be, I take it, unfitting, before plunging *in medias res*, if I endeavour to briefly and succinctly lay before you the reasons which lead me to believe that the subject is one which entitles itself to be considered, even at such length as that at which I propose to treat it. Nothing is more apparent to anyone who, like myself, is addicted to the bad habit of staring in shop windows during the progress of his daily walks abroad, than that during the past ten years the employment of silver for the fashioning of all articles of household use or personal adornment has been largely on the increase. We are, in fact, living in a veritable "silver age."

Into the economic causes which have led to this vastly increased use of what we are accustomed to call a precious metal, this is not, I conceive it, the exact place nor am I a fitting person to inquire too closely. It is, however, apparent that the enormously increased output of silver from the newly discovered mines in Colorado, and other of the Pacific States of America, has played the chief part in the increased and increasing use of the metal in question. Since the discovery of America, for instance, silver has been produced to the value of no less than 14,000,000,000*l.*, of which only 3,000,000,000*l.* can be accounted for in existing coinage. This means that 11,000,000,000*l.* worth have either been used in the arts or practically lost to us. This enormously increased output, a great part of which has, as I have said, taken place in comparatively recent years, has naturally affected the intrinsic value of the metal, that is to say, its ratio to-day as compared with gold is only about half of what it was 500 years ago. The Roman ratio was, in the early days of the Republic, 10 of silver to 1 of gold, and subsequently increased to 12 to 1. The discovery by Spain of the mines of Potosi raised it to 13½ of silver to 1 of gold, at which it remained until the end of the seventeenth century, when the Portuguese practically governed the rate and raised it to 16 to 1. In the last few years it has approached more nearly to the ratio of 20 to 1 than has ever been known in the world's history. This relative cheapness of the metal has doubtless led to its more general introduction into our daily life. Be the cause what it may, however, the fact is certain that one cannot walk down Bond Street or Regent Street without seeing in every other shop window trinkets and nicknacks, personal ornaments and household utensils glittering in all the untarnished radiance of the white metal. Nor to silversmiths proper is this display

* A paper read in the Applied Art Section, May 30, and published in the *Journal of the Society of Arts*.

confined, but silver trifles, either for use or ornament, find a place in the windows of half a dozen other tradesmen and artificers. If this be the case in London, still more so is it in New York, where it would be difficult to find any article of daily use which one cannot procure either entirely fashioned of silver or in the adornment of which silver plays a most prominent part.

It is in articles of personal, and chiefly feminine, adornment that the new era of silverwork is chiefly noticeable in both countries, but especially so in America. Long swinging *châtelaines*, to hook on to the belt and go clattering along by the wearer's side, suspending silver-covered notebook, silver-mounted scissors, penknife, pincushion and so forth by silver chains; silver-mounted shoe button-hooks with chased and *repoussé*-work handles; writing-cases covered with plates of pierced silverwork; boxes of silver, for storing hairpins; round boxes, for the storage of the delusive face-powder and its feathery puff; quaint little receptacles for bon-bons; silver-handled brushes, silver-backed combs of tortoiseshell and mirrors backed with hammered silverwork; heavy silver filigree buckles and girdles; silver-handled paper-cutters, pen-holders, opera-glass holders, spectacle-cases, postage-stamp holders, pencil-cases, are displayed to catch a lady's fancy. For her husband and brothers the range is hardly less limited, and includes match-boxes of silver, cigarette and cigar cases, silver chests for cigarettes lined with cedar wood, hunting flasks, sovereign purses shaped like tiny watches, key-rings, shaving-soap cases, and so forth; while, for domestic uses, or for the purpose of entertainment, gilt-lined bon-bon trays, tiny little lamps, inkstands, cigar-ash trays, photograph frames of filigree mounted on velvet, silver gong stands and bells, card-trays, grape-holders, candlesticks and snuffers, and the usual array of teapots, cream-jugs and other articles classed under the generic title of "household plate," are to be found everywhere.

When, however, we come to consider more closely, and compare the actual manner in which this fashioning is effected in the two countries, we are struck at once by the wide difference of method, almost of principle, employed. Roughly speaking, we may say that the silverwork of England is a tradition, and that of America a discovery. The silversmith on this side of the water is hampered, I freely admit, in some directions. The mere fact of the standard fineness of his metal being rigorously guarded by law, while it has allowed the uninformed public to form a more sure estimate of the intrinsic value of his wares, has, in some mysterious way, lessened their artistic importance. For the last two hundred years at least some sort of check seems to have been placed in this country on the manufacture of silver, though it was not until the beginning of the fourteenth century, I believe, that any actual legislation upon the subject was put into operation. It was then decreed that a leopard's head should be stamped upon all sterling articles of gold and silver. In the year 1337 the Goldsmiths' Company of London was incorporated by Edward III., and this body until the present day have been wont to imprint their company mark, which is the same leopard's head to which I have referred, upon all articles of sterling silver which are manufactured in London. As you are doubtless all aware, there are six other Assay Offices in this country, namely, those of Birmingham, Chester, Sheffield, Edinburgh, Glasgow and Dublin. The hall-mark, which, by these offices, is stamped upon the articles of gold and silver, is evidence that these have been tested and the latter found conformable to the invariable standard of 92.5 per cent. of silver and 7.5 per cent. of alloy, or 11 oz. and 2 dwts. of fine silver to 18 dwts. of alloy. Although there is now no duty on gold or silver plate, the Hall-marking is practically compulsory, and not only this but foreign plate, although it comes in free of duty, must be marked before being placed on sale, and, in addition to the ordinary Hall-marks, have the letter "F" enclosed in an oval escutcheon. There is no manner of doubt but that this legal hampering of a trade or art which ought fairly to be as free as any other has seriously checked its development, at all events as regards what might have become many important branches of the main stem. At present, it is enough for me to point out that in America no such system prevails, and that to this fact is in some measure due the greater artistic freedom and originality which I hope to convince you is the distinguishing feature of the American silverworker. This craftsman, too, has been fortunate in being to a much greater extent free from the enveloping atmosphere of trade tradition, which has well nigh asphyxiated his English brother.

When the modern English silversmith is a staunch copyist and artistic forger, his skill, in a mechanical direction, enables him to produce work which is pleasing to the trained eye, and his reproductions of Queen Anne work and Italian and Dutch Renaissance—as in the fashionable tea-services on the one hand and in, for instance, the elaborate open-work *châtelaines* on the other—are, so far as copies can be so, satisfactory.

In the early years of the American colonies their silverwork, like the majority, if not the entirety of their luxuries, came to

them direct and by importation from the parent country. The old silverwork of Queen Anne and the early Georgian period is hunted for by the American collector in his own New England and Southern States, with all the keenness that is displayed in the same search by those misguided people on this side the Atlantic who are accustomed to pay more for the Hall-mark than for the article itself. In the early days of the independence of the States I believe that little silver plate of any importance was manufactured in the country itself, and when, in the early years of this century, the trade had become more or less established in New York, Philadelphia and Boston, it was to England, or perhaps more especially to France, that the craftsmen looked for their designs, which, I need hardly say, when the period is taken into consideration, were about as bad as bad could be. The impetus given to all domestic and, notably, all artistic manufacture in the United States by that extraordinarily epoch-making exhibition at Philadelphia in the centennial year of 1876, affected no less, indeed perhaps a little more than the others, the art of silverware manufacture.

The most strenuous note in the American artistic character is a reflex of that which dominates their political faith. It is that of freedom, or, as in connection with art matters the word might be spelled, originality. This, though at times it is apt in art as in politics to degenerate into license, is in the former happily restrained by that other and perhaps more hopeful American characteristic, appreciativeness. As in their architecture so in their subsidiary arts, the Americans seem unconsciously to assimilate, in a degree unknown to nations fettered by the bonds of tradition, all that is good in the art work of other peoples, and at the same time to impart to the conglomeration thus obtained a distinct flavour of their own individuality. In no branch is this more distinctly obvious than in their silverwork, though not a little of this virtue, for so I must consider it, is due to the life-labour of one man, whom I can only class, in the important influence he has exerted upon the American art of his generation, with that distinguished architect, Mr. H. H. Richardson, whose name, if not his work, is probably familiar to many here present. The man I refer to was curiously enough no silversmith himself; indeed, in the strictly technical sense of the word, he was not even an artist. I speak of the late Mr. Edward C. Moore, who was secretary to the Tiffany Company, to the kindness of whose London representative I am indebted for the loan of the few articles which you see before you to-night. Mr. Moore, at a time when his firm had already attained that unique position in the economic and social life of New York which they now occupy, recognised that they were in the habit, as is still the case with even the more important silversmiths of this country, of confining their designs for domestic table-ware to the few patterns which in the course of time have come to be considered as standard. Spoons and forks, for instance, were invariably modelled on the lines of the old fiddle pattern, the king pattern or the beaded, and, as is invariably the case when monotonous repetition prevails in a craft, that which originally may once have possessed some meaning and some beauty of its own had become a mere lifeless, senseless copy, with the vices of the original intensified and its virtues rendered of no avail.

Almost from the first Mr. Moore succeeded in imparting to the work of his firm a virtue which I venture to think has been its leading characteristic ever since. And here again I must point out that in this he was but reflecting the spirit of his age and country. We may say what we will about American art work; we may abuse it (and in many cases we are perfectly justified in doing so) as being vulgar and *outré*; we may accuse it (and with justice) of an uneasy restlessness, which detracts to a large extent from its undoubted originality and cleverness; but in ninety-nine out of a hundred cases we find that it possesses the redeeming quality of interest. In no other branch of American art, and in no other American craft, is this quality more patent than in the silverwork. This, I take it, is the chief lesson which our silversmiths on this side of the Atlantic have to learn from America. Let me take as an illustration the most common and ordinary articles of household use. The peculiar qualities of silver, its malleability, its ductility, its practical freedom from oxidation, and its indifference to the action of certain acids, render it not so much a luxury as a necessity for certain of our household utensils. Even the most economically-minded householder must therefore reckon among his belongings a certain number of silver spoons and forks. The intrinsic value of the metal would lead one to suppose that a certain amount of additional cost, in respect to the manual labour of fashioning it, might well be bestowed upon it. The articles which are made from it, and of which I now speak, will last more than one lifetime, and are constantly and recurrently put before our eyes morning, noon and night. It would certainly seem, therefore, that we are not asking too much if we demand from those who are responsible for its production a certain amount of individuality and freshness of design as well as technical skill and soundness of workmanship. But in England there exists among trade silverworkers, as I have already hinted, a more than slavish adherence to tradition

and a slothfulness of mind, as it were, which no other craft can parallel. The spoons with which I eat my soup in my house I find reproduced in all their clumsy, heavy artlessness at the house of the neighbour I visit to-morrow, and were I to dine out in this England of ours on 300 of the 365 evenings of the year, I doubt whether in the whole of that time I should handle more than three distinct patterns of silver plate. In America the case is far different, in that one finds in a majority of households a display of table ware which has been constructed to an original and a unique design. Not that each one has his table ware made specially to order, but the varied assortment of trade patterns of silver ware which are found not only at Messrs. Tiffany's, but at half a dozen other silversmiths' establishments in New York, Philadelphia and Boston, renders it easy for the householder to choose some such variation from the standard and accepted shapes as will reflect more or less his own idiosyncrasy. Thus one finds that a New York dinner-table has something to attract one's attention and call forth either admiration or the reverse, while it gives also some clue, however slight, as to the presence or absence of artistic taste and knowledge on the part of one's host. I want to say, and I must make a little brief excursion from my main subject to say it, that I expected to be able to show you to-night a representative collection of ordinary domestic American silverware. I had relied upon the kindness of the London representative of Messrs. Tiffany, but I had, in a measure, reckoned without my host, for I had forgotten the disabilities imposed upon a foreign workman by the legal trammels restricting the sale of silver in this country. Messrs. Tiffany are unable to keep on hand any of their more worthy examples, and what they have been kind enough to send to-night consist merely of a few odd pieces, which are but random and far from representative examples of their workshops. To these a friend has kindly added one or two pieces of ordinary domestic ware and ornaments. I should like you, however, at the close of my random little talk, to examine for yourself this simple spoon and fork, which is apparently, as I hold it up, a mere variation upon one of our English stock shell patterns. Closer examination, however, will convince you that there is a distinction as well as a difference, and that the distinction is on the side of the American. It has what our similar pattern entirely lacks—proportion, subtlety and grace of line, and plain as it is the perfection of modelling. From the practical point of view, too, it holds its own against its European competitor; it is well balanced and "holds itself," if I may so express it, in the hand in a manner which could only be the result of thought and intelligent care on the part of its modeller. Take again this little oyster fork, which requires a somewhat closer examination to reveal its good qualities. It is more ornate, but it is not on that account that I value it. I saw not long ago, in the shop of a West-End London silversmith, a collection of table ware which was much more elaborate and much more expensive than this little piece, but the engraving and the modelling of those English examples were, as compared with this, heavy, clumsy and almost vulgar. They entirely missed the virtue which this, and which, indeed, the majority of American work, possesses, of being essentially silver and nothing but silver. I mean by this that there is in every metal an inherent meaning and capacity which, beyond everything, should control the designer. The design which is perfectly proper and fitting for silver should strike us as manifestly out of place and inharmonious if applied to any other metal possessed of widely differing qualities. This to many of you present to-night will sound as the veriest truism—and so it is. Yet it is a truism which seems to be a heresy in the eyes of some English silversmiths.

(To be continued.)



The County Council Hall.

SIR,—It appears that the Council are still undecided upon the site for their intended new hall. The last recommendation of their committee, which the Council referred back to them for further information, was of a site on the west side of Parliament Street, between Great George Street and the Government offices, the cost of the acquisition of which was apparently to be three-quarters of a million.

On the same day by another decision the Council (unless circumstances should cause them to change their resolution) deferred the accomplishment of that great metropolitan improvement, the opening of a thoroughfare between Holborn and the Strand, until a date the arrival of which is by no means certain, and is regarded with very different degrees of satisfaction by different members of the community, and by some with feelings far apart from satisfaction.

The site for the County Hall, which is now relegated to further consideration, is, without doubt, a dignified one; but I

think it cannot be said to have any particular claims on the ground of convenience, nor does it appear to be conspicuously economical.

I think, moreover, it is a pity, and it is to point out this that I now address you, that a previous recommendation or suggestion of the Improvements Committee of the Council should be lost sight of. When that committee reported on the scheme for opening a road between Holborn and the Strand, it was one of their recommendations of the scheme that the sloping terrace, by which it was proposed that the junction between the new street and the Strand should be formed, would afford a splendid site for a central, convenient and commanding County Hall. This appears to me to be a suggestion altogether undeserving to be overlooked. From the point of view of convenience a better position than this could scarcely be found, in the midst of the principal thoroughfares and close to the Law Courts and the busiest part of the area under the Council's administration. Certainly Parliament Street will not bear comparison with it in this respect.

Looking at the Strand in its present condition it is true that the site of Holywell Street would hardly be recommended for a building intended to make a dignified impression, but it must be remembered that one object in the Council's scheme for a new street—of equal importance with the provision of accommodation for traffic—was the improvement of the Strand by the demolition of the southern side of Holywell Street, so leaving a broad road north of the churches bounded by the sloping terrace already referred to. Then certainly there will be no lack of dignified accessories to the position.

On the practical ground of economy also, considering that in the construction of the new street and the carrying out of the suggested improvements great expense would be incurred, whether the Council availed themselves of the site they would thus provide or not, I expect that this site would prove to have the advantage over its competitors.

The new street, with the consequent improvement of the Strand, has apparently been put off indefinitely, but it is so important, if not so absolutely necessary, that it is likely to be undertaken even before the day now looked for by the Council, if that should be long delayed, and then the problem of finding a place for the County Hall is solved.

Under such circumstances the Council would, I should think, be well advised to deliberate long before giving their approval to any other site for their hall and incurring the very heavy cost of a suitable building adequate for their accommodation.—Yours obediently,

H. P. BURKE-DOWNING, F.S.I., A.R.I.B.A.

175 Strand, London, W.C.:

June 20, 1893.

GENERAL.

The Annual Conversazione of the Society of Arts is announced to take place on Friday evening, June 30, at the Imperial Institute, South Kensington. The bands of the Scots Guards and the Royal Artillery will perform a selection of music in the gardens, which will be specially illuminated, and the galleries of the Institute, containing the Colonial and Indian collections, will be open for inspection.

The Arnold Local Board of Health have appointed Mr. F. W. Jackson, F.S.I., of Nottingham, their surveyor, in the place of his father, Mr. F. Jackson, C.E., F.S.I., lately deceased, who for a period of thirty-five years held the appointment.

Karl Schlesinger, who was a prominent member of the Düsseldorf school, and produced several excellent landscape and genre paintings, died last week in his sixty-seventh year. He was a native of Lausanne.

Bedingham Castle, in Essex, which is one of the historic residences in England, with a demesne of 2,000 acres, was offered for sale on Tuesday, but the property had to be withdrawn owing to the absence of bidders.

Mr. G. McCredie, Architect, of Sydney, has been elected a member of the New South Wales Parliament for the division of Central Cumberland.

Mr. Henry Gill, the builder and head manager of the Berlin Waterworks, died in Berlin on Saturday, aged sixty-nine. He was born in England.

Professor Curtis began a series of practical demonstrations in forestry at Earl's Court Exhibition on Saturday.

Mr. J. W. Trounson, F.R.I.B.A., F.S.I., Penzance, has been appointed architect for the enlargement of St. Paul's Church, Penzance.

Mr. T. B. Richards, M.S.A., F.S.I., architect and surveyor, has removed his office from 25 Bedford Row, W.C., to Bedford Row Chambers, 42 Theobald's Road (first floor), nearly opposite his former office.

Mr. Charles Barry has been appointed by the Plymouth Corporation assessor in the competition plans for the Prince Rock, How Street and Looe Street schemes for the housing of the working classes.

The Architect.

THE WEEK.

THE death occurred on June 21 of HUBERT JANITSCHKE, the learned professor of the history of art in the University of Leipzig. He was born at Troppau, Moravia. After the varied studies which are gone through by all Germans who are ambitious to become professors he spent a long time in Italy studying the examples of all classes of art which remain there. Then he put his knowledge to a test by serving as assistant in a museum. He was afterwards elected professor of the history of art in Prague. He filled a similar office in Strasburg, and on the death of ANTON SPRENGER he was transferred to Leipzig. He translated some of the minor writings of LEON BATTISTA ALBERTI. Among his writings are books on the Renaissance of Italy, Dutch painting, essays on ANDREA DEL SARTO, JEAN BELLINI, TINTORETTO, PAUL VERONESE, DANTE and GIOTTO. Of late years Professor JANITSCHKE was an invalid, but he bravely continued his teaching in spite of his sufferings.

WÜRZBURG, which is the subject of two of PROUT'S illustrations lately published in this Journal, is of much importance in the ecclesiastical history of Germany. The Irish missionary, St. KILIAN, laboured in the district, and the town became a bishopric in the middle of the eighth century. Most of the important buildings of Würzburg were erected for ecclesiastical purposes. The exhibition of archaeological objects and works of art which is to be opened in the great hall of the Academy of Music on August 6 should, on account of the antiquity and wealth of Würzburg, be filled with much that will be interesting. Visitors can then trace the extent of the development of Franconian art during a thousand years. During the greater part of that period the bishops were the rulers of the district, and they were able to expend large sums of money on promoting the arts. The exhibition will only remain open during four weeks.

AMONG the treasures possessed by the Royal Irish Academy is a manuscript in a metal case known as the "Domnach Airgid," or silver reliquary. It was purchased from an old woman in the county of Fermanagh by a shrewd bookseller, who sold it for 300*l*. The manuscript is a part of a Latin version of the Gospels; and archaeologists of repute, among them EUGENE O'CURRY and GEORGE PETRIE, believed that it dated from the fifth century and belonged to St. PATRICK. The judgments of deceased archaeologists are, however, rarely accepted as infallible by their successors, and the manuscript and its shrine have been of late years subjected to a new investigation. As regards the latter, all that can be ascertained is that it probably belonged in the eleventh century to the diocese of Clogher. But there is no evidence that it was made to hold the manuscript, and nothing to show when it was first employed for that purpose. Time and damp have made the vellum leaves adhere so closely that only a few pages could be examined. The aid of the experts of the British Museum was recently invoked, and as a result a great part of the manuscript has been disunited and can be deciphered. It is now believed that the writing was done in the eighth or the beginning of the ninth century, and is the work of a scribe who was ignorant and careless. From the character of the letters, as well as from the peculiarities of the version that was followed, it is concluded that he could not have been a contemporary of St. PATRICK. Although manuscript and shrine apparently are of different ages and have no relationship, we suppose the Council of the Academy will not place them apart in sections of their museum. Who knows whether at a later time it may not be again decided that the vellum and metal have kept company for a thousand years at least?

THE system of M. EUGÈNE HERMITE will be employed in connection with the sanitary arrangements of the International Exhibition of Hygiene, which is to be held at Havre in August. It consists, as some of our readers are aware, in the employment of sea-water which has gone

through a process of electrolysis as a disinfectant. M. HERMITE claims that the fluid when so treated is able to destroy completely or to change the character not only of organic matter in a state of putrefaction, but the most offensive gases. What is more important is that germs which are the most tenacious of vitality, such as the typhoid bacteria, are unable to withstand the prepared sea-water. The discoverer's experiments have been verified by the French Conseil Supérieur d'Hygiène, and the fluid has been largely used in Havre and elsewhere with good results. M. HERMITE proposes that in towns near the sea prepared sea-water should be laid on to all houses like potable water or gas. In towns more remote a substitute can be found by adding chlorine in some convenient and inexpensive form to ordinary water, which is then conveyed to the apparatus for electrolysis and goes through the treatment adopted with sea-water. So many wonderful schemes for dealing with sewage have turned out failures, people will not readily believe that M. HERMITE has solved the most difficult of sanitary problems without wider experience of the results. The investigation which his discovery will receive at Havre will therefore be watched with attention.

WHEN the London School Board proposed obtaining plans by competition from unofficial architects for a school to accommodate twelve hundred children, we pointed out that the indefiniteness of the site was a drawback. After several months' deliberation it has been decided to fix on a site in the Fulham Palace Road as the most suitable. The competition will therefore refer to a school in that position for 1,200 children, showing means of enlargement to accommodate 1,600 children, with all necessary classrooms, teachers' rooms, staircases, cloakrooms and lavatories. In the event of the plan of a three-storey building being adopted, a separate hall must be provided for each of the three departments; but in the case of a one-storey building, one hall only need be provided for the use of the whole school; the planning to be subject to, and in conformity with, the rules and regulations of the Education Department. The plan is to embrace a drawing classroom, so arranged as to be accessible both for boys and girls, and with this exception no special or technical classrooms are required. A teacher's residence is not to be provided, but a schoolkeeper's house must be shown, also playgrounds and boundary walls. The designs are to be sent in between the 8th and 15th of September, 1893, both days being inclusive. The competitor whose design is placed first in point of merit by the assessor shall be paid a premium of 150*l*.; the competitor whose design is placed second shall be paid a premium of 100*l*.; and the competitor whose design is placed third shall be paid a premium of 50*l*. The first premiated design shall be the property of the Board, and all other designs shall be returned to their respective authors immediately after the public exhibition of the competitive designs, which the Board reserve the right to hold during a period not exceeding two months from the date of the award. The competitor to whom the first premium is awarded shall, in the event of the Board erecting the school shown on his plans, be employed as architect, and shall be paid in accordance with the schedule of professional charges published by the Royal Institute of British Architects, such payment being additional to the premium of 150*l*. Mr. J. MACVICAR ANDERSON will be the professional assessor. The following will be deemed by the assessor to be grounds for disqualification, viz.:—Any attempt on the part of a competitor to make known his identity, or to influence the decision of the assessor, personally or through any member of the Board or otherwise. The delivery of a design after the specified time, unless arising from accident in transmission, explained to the satisfaction of the Board. Any encroachment, however slight, beyond the limitations of the site as laid down and figured on the plan supplied. Non-compliance with the conditions respecting the drawings required, whether as to the number, scale or style of execution. Material excess of cost in the opinion of the assessor beyond the outlay that would be sanctioned by the Education Department. Departure from or non-compliance with any of the conditions embodied in the instructions, the whole of which will be rigidly adhered to and enforced.

WORKING DRAWINGS.*

IN the pages of the handbook on the preparation of working drawings we find much of what CARLYLE calls "that kind of knowledge which holds good in working," and to which nature is supposed to say, "Yea! yea!" Everybody knows, or ought to know, that many drawings which are considered satisfactory have to undergo various changes before the subjects are realised in materials. It does not always happen that the extent of the operations is acknowledged by those who perform them or is recognised by the original designers. But the fact remains that little things as well as big, girders, no less than tiles and wall-papers, can only be made when the drawings are treated in a manner which the workmen can understand and which corresponds with the processes to be employed. To a great extent in England the adaptation is kept secret.

With the sort of teachers, superintendents and examiners by whom the system of the Government schools of art are kept going for their own advantage, it is impossible to expect that anything relating to the business of a factory or a workshop can count for much. Pretty drawings are got up by the students, and it is supposed that work can be executed from them. It is not believed that when any of the drawings are employed by manufacturers, who wish to flatter the authorities, they have to be transformed, unless in those cases where the artists happen to be attached to workshops and adopt a sort of treatment that cannot be called official. In the first contribution in the book before us—that is, on "Carpet Designing"—the author, Mr. A. MILLAR says:—"It is of the greatest importance that a carpet designer should have the power of indicating form by mass instead of by outline, and this faculty is rarely met with in this country, probably owing to the method of teaching in favour at most of our schools of art. I have never yet met with a designer wholly trained under the system in force there, who had the power of indicating light and shade by solid distinct masses of colour." Mr. MILLAR, like many other simple people, is under the delusion that the schools should have some connection with manufacturers; he does not see that the fine gentlemen who work them take a more exalted and personal view of what is needed, and that for amateurs, who have to prepare reports, outlining is easier to deal with than masses of colour. That French carpet designers "have the power of representing by blotches of colour a perfectly-modelled flower or scroll, with lights, shadows and affected lights," does not concern the officials; they have not to design or weave carpets, and besides flowers, lights and shadows were long ago excommunicated by aid of departmental canons. Mr. RATHBONE also, in his essay on metal-work, refers to "those errors of construction which make the British (or other) workman scratch his head and wonder why designers were created for the apparent purpose of setting him problems which he can never solve," but what signifies the puzzles of workmen so long as South Kensington flourishes and the statistics in the blue-books relate to millions of figures?

The information contained in the volume published by Messrs. BELL & SONS can do much to enable designers to come nearer in touch with the workmen. The pages reveal many things which are now held to be trade secrets. A man can never make entirely satisfactory working drawings unless he has had more or less acquaintance with workshop practice, and thus in his mind's eye can see the materials that are to be employed and the processes to which they are to be subjected. Unfortunately too many draughtsmen are never able to get beyond the pictorial or representative qualities of their drawings, and cannot adequately realise all that their lines should mean. It is not possible for any book to enable mental deficiencies of that kind to be wholly overcome. There must be sufficient contact with objects until they become realities to the mind. Several of the authors who have united in composing the essays on practical design admit the limitations of their ability to explain. But they have done something which will make up for the shortcomings of the art schools and of most of the treatises on design. A designer who

has followed the advice of the writers will not appear as an amateur to any workman into whose hands his drawings may fall.

The titles of the essays will suggest the range of the volume, and it will be observed that the authors can claim to be accepted as specialists, viz.:—"Carpet Designing," by A. MILLAR; "Woven Fabrics," by A. SILVER; "Pottery," by W. P. RIX; "Tiles," by OWEN CARTER; "Metal-work," by R. LE B. RATHBONE; "Stained-glass," by SELWYN IMAGE; "Drawing for Reproduction," by GLEESON WHITE; "Bookbinding," by H. ORRINSMITH; "Printed Fabrics," by A. SILVER; "Floorcloths," by A. SILVER; "Wall-papers," by G. C. HAITÉ. The explanations in the essays are made clear by aid of diagrams and illustrations which are as practical as the text. Authors and publishers have supplied a volume that is worth far more than the price charged.

The advice is conveyed in the simplest and most explicit manner, and there is so much of it that extracts can be selected with difficulty. A part of Mr. SELWYN IMAGE'S essay, relating to a church window with a single figure, may, however, serve as a sample:—

Let us take next a piece of white endless cartoon paper, and draw on it in black chalk an outline of the lancet window which we have to fill, of the exact sight-size and shape. For a small window like this we may get the paper strained on a stretcher; that will make our work pleasanter no doubt. In the case of large windows, however, it is more convenient for the people at the glassworks not to have the cartoon on a stretcher; for a design of any considerable size, therefore, I would remember this, and make the drawing on a piece of paper pinned against a large board or against the wall, rolling it up from time to time at either end as may be necessary in the course of working at it. A very little practice will enable us to draw under these conditions quite easily and pleasantly enough; and we shall save the men at the glassworks, as I have said, not a little inconvenience.

Well then, we have traced out in a black chalk line the shape of the window. A quarter of an inch within this all round draw another line, and fill up between the two with black chalk; this thick black line represents the external border of lead. And here, let me say that wherever any lead is to come in the window I represent it on the cartoon by a black chalk line such as I have described, a quarter of an inch wide.

Between the stonework of the window and the coloured glass (in order slightly to detach the design from the wall) there always must run what is called a "white line;" a very narrow border, that is, of plain white glass. I represent this in the cartoon by leaving a border of white paper, rather wider than a quarter of an inch, next to the external border of lead; and this white border is itself edged on the other side by a lead, drawn, as always, a quarter of an inch wide. Then the entire space enclosed by the inner of these two lead lines is the space we have to fill with our design.

In the window before us, we said that we should put the figure of a saint. I will make this figure as large as the space will conveniently allow. Taking a piece of charcoal, then, I draw the figure in from my sketch, being above everything careful to get its proportions, masses and main lines satisfactory; and, for this purpose, constantly standing at a good distance from my cartoon, and looking at it reversed in a glass, so that I may see it as a whole. When I have got the figure in this way to my mind, I will draw in and model very carefully the head, the hands and the feet; and then enclose each of these with a lead line. . . . I should then go on to trace carefully the outline of the whole figure and the forms of the drapery, wherever the edges of it come (as, for instance, in the turnover of a sleeve), and to enclose these with a lead. We shall have got in this way the entire figure drawn, with such of the leads as are absolutely necessary in their places. Now let us join these latter to one another, with straight leads running horizontally and perpendicularly across the figure and sometimes at a slight angle for variety's sake. One can lay down no absolute rule at this point, the thing must be left to the designer's fancy at the moment; all that one can say is, keep the pieces of glass of a simple shape, of a fairly varied shape, and small in size.

The youngest student will be able to understand suggestions which are given so plainly, and throughout the pages there is no less care in avoiding all obscurities of diction. Every one of the writers could join with Mr. HAITÉ in saying, "I have sought honestly to place the practical experiences of a number of years at the disposal of the student—experiences which came to me gradually, and by the closest possible application." The book can be taken as supplementing the different treatises on ornament. It does not deal with styles except in regard to their fitness for execution. The writers wisely keep within prescribed limits, and in doing so they have been able to render more service to students than if they entered on disquisitions about theories of ornament and the like. They have attained a completeness that is remarkable considering the size of the book. The work will be useful to designers who wish to keep to one branch of manufacture, or to those who are trying to prepare themselves in order to be equal to all

* *Practical Designing: a Handbook on the Preparation of Working Drawings.* Edited by Gleeson White. George Bell & Sons.

demands that may arise. Any among them who desire to produce drawings for the illustration of books or periodicals will find ample instructions in the editor's paper on "Drawing for Reproduction."

AN ARCHITECT'S ESSAYS.*

IN one of the essays which Mr. WHELAN has reprinted he says, "I used to work ; now I gossip." The words may be taken as a key to the contents of the small volume. An architect in successful practice cares only about expressing his thoughts on drawing-paper, at least in this country ; and very few names of men who received commissions for building are to be found in any catalogue of books. When an architect becomes a writer he must feel like a man who employs a foreign language in composition. He may use the words correctly and with skill, but in his heart he is sure to wish that he was allowed to show his power in an exercise with which he was more familiar. Mr. WHELAN'S gossip is very pleasant reading, which can have interest for many readers besides architects, but it would be better if the qualities which are partially revealed in the gossiping could be utilised for the benefit of the world by employing building workmen rather than compositors. The author does not believe that a paper or printed speech can alone reveal the thoughts that arise in us, for, as he says, "The arts are only different methods of expression ; their mother-idea is in its essence the same, though the children thereof may be poems or painting, melodies or architecture." Apparently Mr. WHELAN could employ more than one of those methods with skill, but at present he is satisfied, and it is a pity, to be a gossip.

In this rôle he does not forget, probably it would be impossible, that he is an architect. He is not, however, shoppy, nor does he make himself ridiculous, like some men, in seeking the sympathy of the world because the supremacy of the profession is not admitted on all sides, and he is nowhere pedantic. By nature Mr. WHELAN was made an observer and thinker, but he must have regarded things and reflected on them in a different sort of manner if he had not received a training as an architect. Anyone who will take note of Mr. THOMAS HARDY'S respect for shadows when describing a place (to mention only one peculiarity of his novels) must see that the writer was at one time enjoined to "think in shadow" when designing. Still more evident is the link which unites Mr. WHELAN to architecture, for it appears in parts where it was not expected. Thus, when speaking about a part of Derbyshire, he says:—"One couchant rock, blue-black, mysterious, dominates the Dale down to Derwent Valley. This gloomy monster is, I am convinced, an ancient dragon. His comparatively modern name is Hu Gare: romantic enough ; but what it may have been I know not when, in forgotten æons, he fought his brethren in the slime. I would now, however, build a deeply-founded castle on his back, and thus, like a tiger-moth to cardboard, pin him to his upland for ever." The suddenness of the transition from palæontology to building produces some of the effect of wit. In another place, when referring to "the subtle bonds which unite the moods of man and of nature," he gives an architectural illustration which, to many readers, will appear as daring as novel:—

We understand the language of our painters and our poets, but do we quite understand the voice (mute, yet eloquent) which discourses passionate love in the tendrils of hard stone, and thrills us with echoes of romance from mountains building-crowned and sea-set gems of art ? The men of the Middle Ages loved nature with a love as intimate, though differing in form of expression, as any modern. But, intense as was their love, it was practical and energetic ; to them a lovely knoll existed that it might be perfected by a still more lovely tower, which should gather to itself all the force and beauty of the surrounding landscape ; to them a fertile plain, with its level lines, was a foil for the rocket-like upspringing of many hundred feet of tapering stonework ; to them a river-brightened valley was made to be the haunt of monasteries, whose carved capitals and spandrels should repeat the herbage and flowers, even as the translucent stream did in its own sweet but different way. And when nature, as in Mont St. Michel, put on a more daring mood than usual, the poet-builders caught her spirit and outdared her own audacity.

An architect will divine from the foregoing extract that Mr. WHELAN is a Gothicism, or as he describes himself, was

"suckled in the creed, nowadays forlorn, of Mediævalism." He has much to say which is subtle about the builders of that time, as when in his essay on "The Glory of Heights" he tells us:—

A feeling of humour, almost mad, strengthened in the builders as they left the earth. Sardonic faces began to grin down on the underlings : relentless gargoyles prepared themselves to splash the pavement-haunting burghers. But the designers ever had the sense of plumb descent before them. Their weird creations were often winged and always of the tribe of sprites ; they could fear no fall. When the half-human demon of Notre Dame who sneers upon Paris was first brought from the gates of hell, he was guarded by a parapet. The figures of the pious oxen, in the open pinnacles at Laon, stare from between close ranged columns. Because they had rushed of their own will from the plain to be harnessed to the cathedral stones, their secular safety was made sure. Should they go mad with height they could not leap down. It is evident that the architects of old knew that until the ordinary mortal is gifted with wings the terror of sheer descent will shake his nerves almost to dissolution. The instinct of ascent, especially characteristic of the plain-dwellers, found complete satisfaction in the Middle Age. This instinct allied itself with a much nobler emotion. The national impulse, encouraged by religion, embossed the great shield of Christendom with fretwork of spires ; the blazonry stretches from the sub-tropic South to sub-arctic Norway. Viollet le Duc relates that there was certainly much rivalry between city and city as to the loftiness of their respective fanes ; at Beauvais ambition overleaped itself remarkably. But it is not for us to criticise these gifts of the kings. We may struggle on a fugitive page to fix for a moment our light-hearted opinions on their life's work ; they with inspired chisel struck an authentic idea into vital stone.

One essay is devoted to "The Gothic Renaissance," and the credit for the revolution which is signified by the phrase is ascribed to AUGUSTUS WELBY PUGIN. Whatever shortcomings we may find in his buildings, and it must be admitted they have as little repose about them as PUGIN himself, nobody can deny that he exercised a mysterious influence over his contemporaries. The man who in a few years after his change from Protestantism presumed to lecture Roman Catholic bishops and priests on theology, while he was supposed to carry out an engagement to give instruction in architecture, who was patronised by ecclesiastics after he had described the sanctuary of the principal church in London as corresponding with the proscenium of a theatre—nay, after declaring St. Peter's to be a mass of imposition and the city of the Popes as miserable, disgusting and depressing, and, a greater feat still, who was able to move the placid GILBERT SCOTT for once into a state that might be called enthusiastic—is not to be judged by the rules which govern everyday people. Look at the difference in the productions of Birmingham before and after PUGIN'S designs were employed there, and his potency will be manifest. In the exhibition of 1851 it was the Pugin or Mediæval Court which saved England. We must remember, too, that he received no training from a master. Whatever he knew he taught himself, for all his easy-going father could do for him was to allow him to see how drawings for engravers could be produced. In exercising his influence there was no diplomacy about PUGIN. He cared as little for a manufacturer as for a prelate, Roman or English, and he never disguised his contempt of men or things. People were allowed no time to controvert his theories ; they seemed to be subjected without resistance. Even the Office of Works was subdued by him, and he was permitted to confine luckless theological students at Maynooth in cells that would excite mutiny in a penal settlement. It is no wonder the Irish priests come out of them more inimical to England than when they entered. In spite of such defects, which arose from want of experience, PUGIN'S work is marvellous in quantity and variety, and in being produced by his own right hand. Yet he lived barely more than forty years. He had exhausted himself by the time other men have finished the preparation for a career. It must be acknowledged that few have cared to uphold PUGIN'S reputation, and Mr. WHELAN is courageous in writing so much in his favour. In spite of neglect, he has so much faith in his idol's magnanimity, he imagines that PUGIN would look favourably upon most things if he were able to have another glimpse of England.

Were Pugin now among us, as he very well might be, what would he think of the last forty years of architectural endeavours ? He would see that the seed he sowed had not altogether fallen on sterile soil. He would recognise on the whole a higher aim of effort, a more complete realisation. He would probably regret a latitudinarianism in selection of types to be followed, and a license in the seizure of forms more striking than beautiful ; but his mellowed judgment would likely condone the weakness that attends upon fashion : he would

* *An Architect in Exile ; and other Essays.* By Bernard Whelan. London : Burns & Oates, Limited.

confess that sky-lines are governed by laws similar to those which distribute dress improvers. He would admit, as something to be reckoned with, the longing for a new thing, which, from the time of the Athens of St. Paul, has irked the minds of men. He would pardon a little extravagance if he saw it mingled with a little sincerity. He would be told the Houses of Parliament, with which he had so much to do, were still the mural crown of a triumphant race. He would meet his contemporary Pecksniff flourishing anew in Piccadilly Circus. He would praise countless country mansions and town houses that are not without an intimate charm of their own. He would the better understand the Renaissance reaction when he gazed upon the Law Courts. He would find less stupidity, more imagination, less carelessness; he would welcome the signs of improvement, slow but steady, which, amid stress and struggle, point to a better architectural future.

Another worthy, who was far better disciplined and was without any trace of PUGIN's theatricalness, viz. WILLIAM BURGESS, is also lauded by Mr. WHELAN. He expresses only an opinion that is now general among architects when he says:—"Even if one disliked a style, one could begin to love it if it gave us such a man as BURGESS. It is a little less than a national catastrophe that no great building of his is always before the eye of the public—such a building as he would have raised where Mr. STREET's Law Courts now stand."

The place of exile to which Mr. WHELAN is doomed appears to be "a quiet corner of Kent." Many toilers in London offices during sultry days will envy his lot, for "within a few miles are Hever Castle, Penshurst Place, and Knole House." He can also gaze upon brickwork which does not appear odious to nature, for in some examples "kindly winters and amorous summers have dyed them deeper than richest peonies." In such a place there is a chance for meditative moods, and a man who can produce such a collection of essays as accompany "An Architect in Exile" should be able to derive compensation for temporary withdrawal from practice. Let us hope the little volume is only a forerunner of many others, for a more frank and genial pocket companion on a holiday tramp is not easily discovered in the libraries.

WESTMINSTER ABBEY.

THE following protest has been issued by the Society for the Protection of Ancient Buildings:—

We feel ourselves compelled to call the attention of the public to the present condition and immediate prospects of the Church of St. Peter at Westminster: and this seems to us to be all the more necessary, because the public have scarcely understood the really important considerations which should be kept in mind in dealing with this piece of national property. The idea that is current in most people's minds seems to be that, apart from its function as a place of worship, it is to be used in some way or other as a kind of registration office for the names of men whom the present generation considers eminent in various capacities; the method of so registering them being the placing of a monument to their honour in the church and sometimes burying their corpses beneath the pavement. That this strange notion, which seems to have first taken root about the end of the seventeenth century, and was in full vigour all through the eighteenth and the earlier part of this century, is still alive in most men's minds, is clear from this fact, that now, when even the Dean and Chapter of Westminster have declared that burials in the Abbey must cease, and when it is clear to the most casual observer that the church is crowded to absurdity with specimens of the gravestone-cutter's art, the public still think that the corpses of notabilities should be buried and their memories noted, if not in the Abbey, yet at any rate in some building contiguous to it, which is, if possible, to make a pretence of being a part of it. The result of this feeling in the public has been that more than one scheme has been elaborated for providing space for this registration of notables in connection with the abbey; of which it may be said that the best of them seemed likely to do not much harm to the remains of the ancient abbey outside the church, and that the worst intended the actual destruction of part of the church itself by pulling down the wall of the north aisle in order to foist a nineteenth-century imitation of thirteenth-century architecture on to us as a part of the ancient building.

Moreover, it must be said that the ordinary visitor to the abbey goes there not to see the church but the monuments of all kinds that it contains, and the Dean and Chapter understand this so well that while they throw obstacles in the way of those who want to study the architecture they arrange for the following round of the monuments, mostly in the company of a showman after the fashion of Mrs. Jarley.

It must be said, furthermore, that the building suffers from

the neglect of the most ordinary measures for keeping it clean and neat, and though it is true that it is difficult to struggle with London filth, yet its worst evils might at least be minimised. If the revenues of the Chapter are insufficient for dealing with this disadvantage, a public subscription might be opened for the purpose.

We fear, therefore, that in following out this curious superstition of the two last centuries, that it is necessary that Westminster Abbey should serve the purpose of a "National Valhalla," the public have neglected all other uses to which this building might serve, except that of a place for the decent celebration of the services of the Church of England; and that they are careless of what damage the church may suffer so long as it fulfils these two offices. But this carelessness, as a matter of course, extends to the injury which Westminster Abbey may receive at the hands of those who do see another use for it, viz. the literal reconstruction of lost or damaged features of the architecture of its earlier life; the "restoration," as it has been called, of the art of a period very different from ours.

Externally at least this great church has, from one reason or another, suffered more from the seventeenth and eighteenth centuries than most others of its size and dignity; being situated in the centre of government of this country, it has not enjoyed the advantages of boorish neglect which have left so much of interest in Mediaeval buildings in remoter parts of the country. Every generation after the decay of living organic art has added its quota to the degradation of the building. Setting aside the destruction of furniture and decorations which, as a matter of course, took place under the two Puritan upheavals, and which was not so complete here as in some churches, the repairs or renewals done at different periods before our own, by men who had no sympathy with the original work, have been sufficiently disastrous to the exterior. The heavy hand of the academical classical architect has been more or less all over the building outside. The north transept, which in the time of Hollar, if one may judge from his curious nondescript engraving, was in a genuine condition, though possibly needing repair greatly, was reduced to the due commonplace ugliness which was then thought to be impressively respectable; the western towers omitted by the Mediaeval builders were supplied in the same style, having been probably designed by Wren and carried out by Hawksmoor, and remain in good condition as monuments of the incapacity of seventeenth and eighteenth-century architects to understand the work of their forefathers, and perhaps one might say that they furnish a wholesome lesson to future ages not to attempt the imitation of a past epoch of art. If the architect or architects of these towers had left the Gothic alone and had built the new towers in the queer style of driven-into-a-corner Classic, which is that of the City church towers of or about that date, they certainly would not have jarred our sense of congruity so much as the quasi-Gothic existing ones do, and also, which is a great point, they would not have been so ugly. Wren's "restoration" of the south clerestory also was to be seen a year or two ago. This had to do with the ornamental features of the windows, which were reduced to the Bible and Prayer Book style of the period, but left the main surface of the walling alone.

The beginning of the nineteenth century saw an important degradation in the rebuilding of the exterior of Henry VII.'s Chapel by Wyatt; the type of the architects of the first period of Gothic knowledge who were far more destructive than those of Gothic "ignorance," and, moreover, had no style of their own, and give us examples of the very extreme of academical lifelessness. Mr. Wyatt managed to take all the romance out of the exterior of this most romantic work of the late Middle Ages, and has left us little more than *caput mortuum*, an office study of the exterior of the chapel.

Blore began in 1809 the recasing of the north aisle of the church, a work which was finished by Gilbert Scott; the two between them completely destroyed all trace of the handiwork of the Mediaeval masons in this part of the church.

All these degradations belong to the time before the genuine "restoration" mania fell upon Westminster Abbey; they are well-meant, ill-conceived and disastrous pieces of repair of various degrees of stupidity, culminating in the last-mentioned wholesale destruction of the thirteenth-century masons' work.

Sir Gilbert (then Mr.) Scott was appointed architect of the abbey in 1849, by which time the second period of architectural Gothic "knowledge" had arrived. He "carefully restored" the chapter-house, that is, he made it (we are speaking of the exterior now), a modern building, imitating with about as much success as is possible in such cases the work of the thirteenth century. It has no longer any claim to be considered a work of art; it is the architect's architecture, the work of the office, in which the executants are in no degree taken into council.

The work of "restoring" the exterior of the church was carried on by Mr. Pearson (now living and still the architect of it). His work on the south side of the church is now pretty much complete, and is of the same quality as Sir Gilbert

Scott's. But not satisfied with the eighteenth-century transfiguration of the north transept (who could be?) and driven by the necessity of making some structural repairs, he carried on the idea of making a conjectural restoration of the north transept, which was begun by Sir G. Scott. This work has now been accomplished, and he who runs may read.

The result is most unsatisfactory. Admitting that the eighteenth-century work was in no way good as an independent work of architecture, it was nevertheless done by men who put some of their own thought into it, poor as that was; moreover, they had not learned how to forge thirteenth-century architecture, and they had retained the outline of the old work, so that between what the eighteenth century left and what it produced, it was of some historical value at least. Its artistic value chiefly lay in the fact that, owing to the action of wind and weather, the surface of it was not unpleasant; and altogether it was so little distracting that it was no bad preparation to the visitor for the solemn beauty of the interior of the church.

The work that has taken its place is, as it was bound to be, with such ideas leading its architects, another example of the dead-alive office work of the modern restoring architect, overflowing with surface knowledge of the Mediæval work in every detail, but devoid of historic sympathy and true historical knowledge, and with no other aim in view than imitating the inimitable. But this example of the error is made more palpable and absurd by the fact that it is an imitation of very ornate thirteenth-century work, including abundance of figure sculpture. Now we must remind our readers that the free carved ornament of the Middle Ages (whether of figures or not) was the handiwork of artists, and whatever their shortcomings might have been they were expected to and did express their own conceptions with their own hands; they were undoubtedly the best artists of their time for the work in hand; they belonged to no inferior rank of artists, that is, but were the leaders of their art; there were no artists above them doing work more intellectual and educated. Their productions, therefore, were always genuine works of art, whatever their relative merits might be.

Nor is that all; they were working under the full influence of traditions unbroken since the very first beginnings of art on this planet; they were entirely unable to feign themselves other than they were, artists of their own day: any real artist of the present time will at once be able to see what an advantage this was to them; that the bond of tradition was so far from being a fetter, that it left them truly free to give form to their thought according to their own wishes. Their works still speak for them, and show us what a great body of artists of the highest skill and sense of beauty was at work amidst the scanty populations of Mediæval Europe.

It is clear then that the Mediæval architect, master builder, abbot or whoever else planned the building, could never have been at a serious loss for skilful men to decorate his building according to the fashion of the time. Let us turn the page and see how it stands with us now in this matter. There are undoubtedly many clever sculptors (or modellers, rather, for they do not as a rule carve their own work) in civilised countries; but the capacity for designing and executing the subsidiary forms of carved ornament has completely departed from those countries on the one hand, while on the other the sculptors aforesaid are divorced from architectural or ornamental work, and most of them would consider themselves treated with less than due consideration if they were asked to undertake it. The few instances in which they have timidly attempted to get into some relation with architecture have had such poor results as clearly to show how difficult it is for them to produce any work which is not merely isolated and ornamental.

This is so obvious to the architects in need of carved work for their imitative restorations that they never even attempt to employ artists on their work; but a supply has sprung up to meet the demand, and workmen are employed to produce imitative Gothic sculpture in which they have no interest, and of the spirit of whose prototypes they have no understanding; the tangible result of this being what is called ecclesiastical sculpture—so utterly without life or interest that nobody who passes under the portal of the church on which it is plastered treats it as a work of art any more than he does the clergyman's surplice within the building.

The restoring architect is therefore in this dilemma, that what there is of skilful and original sculpture is not fit for his purpose, and will not make ornament; and that what he can have and which professes to be ornament has no artistic value. What is to be done in such a case? The common-sense view of it would be that he had better forego the ornament. But here he is met by the difficulty that he has set out to make a scientific imitation of, say, a French portal of the thirteenth century, and such portals always had sculpture of such and such subjects on them, so that his restoration will not be thorough unless he has the due amount of quasi-ornament to show. Therefore in the teeth of reason and logic he is compelled to accept the makeshift for the real thing, and as a consequence to leave his work bedizened rather than ornamented.

That this has necessarily been the case with the new front of the north transept at Westminster must be obvious to anyone who understands art, and in spite of all the knowledge and skill of the architects it could not have been otherwise, considering the point they started from. If any such person doubts this, let him compare the new imagery of the porches with the angels high up in the transept within, or let him look at any piece of genuine carving there and compare it with the subsidiary work in the porch, and he will surely see in every line of the first the vigour and pleasure of the hand of the workman, and in the other a joyless putty-like imitation that had better have been a plaster cast.

To sum up then the case of the outside of Westminster Abbey; a long series of blunders of various kinds, all based on a false estimate of the true value of the building, have damaged it so vitally that scarcely any of its original surface remains, and we have nothing left us but a mere outline, a ghost, so to say, of what it was. A great misfortune truly, and an irreparable one. What else is left us of the Abbey Church that is still so valuable that we are in a trouble of anxiety lest this also should be taken away from us?

In a few words the interior of the church is left to us; and this, while the exterior has suffered so grievously as to have been all but entirely destroyed, has been less damaged than many other great churches. In fact, were it not for the result of the mania for monuments, that as aforesaid has been so recklessly indulged in up to the present moment, the interior of the Abbey Church would be comparatively in a very good condition, and would leave little to be desired save the clearing away of the imitative and unoriginal stained-glass which has got into the windows at various times, to the great damage of the effect of the church. As to the monuments once more, the burden of their ugliness must be endured, at any rate until the folly of restoration has died out; for the greater part of them have been built into the fabric, and their removal would leave gaps, not so unsightly indeed as these stupid masses of marble, but tempting to the restorer, who would not be contented with merely patching them decently, but would make them excuses for further introduction of modern work. In short, disastrous and disgraceful as these pieces of undertakers' upholstery are, and though they make us a laughing-stock among nations for our folly in having permitted them to blemish the church, they protect us from the still greater disaster of the platitudinising of the whole interior by a "thorough restoration."

It is the rumour of the contemplation of this "thorough restoration" which makes this memorandum of our Society necessary, and we shall have presently to recur to it, but we must first write a few words of recapitulation and of definite explanation of the position of our Society in regard to this matter.

We have stated that amidst the neglect of the general public which Westminster Abbey lies under there are two views taken of it. The first that it is a convenient receptacle for the monuments of the notorieties that rise up, wax, wane and set from time to time.

The second that it is a good piece for the exercise and exhibition of the skill of the modern architect, and his scientific knowledge of the methods of design and building of the Middle Ages, which is so complete that it enables him to surmount at one stride the difficulties created by the long lapse of years, and the complete change in ideas and the structure of society which it has brought about—that in short Westminster Abbey can be renewed in our time, and that, being renewed, it will be the same Westminster Abbey which the eyes of Chaucer beheld when he was yet in the flesh.

Those, we say, are two views. Is there no third? Yes, there is the view of this Society, which can be stated easily and shortly. It is this. Westminster Abbey, in spite of all injuries, is a great work of art, valuable to all succeeding generations as long as it holds together, and it can by patience, pains and good judgment be held together for an indefinite time. Moreover, the art of it is inextricably interwoven with the history which has, in fact, produced it. It may seem strange to some that whereas we can give some distinguished name as the author of almost every injury it has received, the authors of this great epic itself have left no names behind them. For indeed it is the work of no one man, but of the people of South-Eastern England, working in the manner which the traditions of the ages forced upon them. And that is the reason why we must accept as irreparable those injuries which it has received, and which we lament so much. It was the work of the inseparable will of a body of men, who worked as they lived, because they could do no otherwise, and unless you can bring those men back from the dead you cannot "restore" one verse of their epic. Rewrite the lost trilogies of Æschylus, put a beginning and an end to the fight at Finsbury, finish the squire's tale for Chaucer, even if you cannot

Bring back him who left untold
The story of Cambuscan bold,

and if you can succeed in that, you may then "restore" Westminster Abbey.

But though you cannot restore it, you can preserve it. And we must tell you that to do less than this is to involve yourselves in a great national stupidity, a national crime in fact. For this at least you can do, whatever the condition of the arts among us may be. Care and common sense will enable you to do that without the expenditure of any great faculty for the production of art.

Lastly, if we are asked if it be worth while to take this trouble, and what is the importance of this piece of architecture as architecture, or what rank Westminster Abbey takes as a work of art, we can only say that, setting aside all the glamour which history and tradition have cast over it, it is a building second to none amongst all the marvels of architectural beauty produced by the Middle Ages. Like all such buildings, its beauty is convincing, and sets criticism aside. And the man who is not moved by it must have resigned the human faculty of letting his eyes convey ideas to his brain.

We must now mention the rumour of "restoration" of the interior which has alarmed us. Something is certainly in contemplation, but what it is, whether it be needful repair or destructive restoration, we cannot tell you. And this for a very definite reason. Having, in common with the rest of the public, heard the rumour, we thought that we were bound by our position before the public to refuse to accept mere hearsay, and to obtain definite, detailed, reliable information from the delegated guardians of the abbey, the Dean and Chapter. We wrote to that body, then, simply as a part of the public that wished for information, and we were met by a refusal to give any information. We must suppose, because the Dean and Chapter misunderstood us, and though we considered them responsible to us, and not to the public at large, as we certainly do consider them. We can only express a hope that they will tell the public what they intend doing with what is really, if not legally, a piece of national property as speedily and as directly as they can.

It is in this hope that we have delayed calling public attention to the matter for so long; but we feel that it will not admit of indefinite delay, and accordingly put our views before the public.

If we are asked what should be done, our reply is very simple. We believe that one architect, however distinguished and learned, is too heavily burdened by having the sole charge of the abbey in his hands. We think that a consultation should be called of the best practical architects, builders and engineers, and that they should report as to the stability of the fabric, and what means should be taken to render it thoroughly secure; and, a satisfactory scheme having been agreed on, funds should be obtained from Parliament, or if that were not possible, by subscription from the public at large, for carrying it out without delay. But we are also sure that such a scheme should disclaim most emphatically any intention of meddling with the ornamental features of the building.

The structural stability having been secured, the Abbey should be kept clean; and otherwise not be touched at all. That is the only thing to do, and there is no second course which would not lead to fresh disaster. Let bygones be bygones, but do not let us enter on a second series of alterations and improvements which will deprive us at last of all that is now left us of our most beautiful building.

TESSERÆ.

Poetry and Painting.

WHATEVER art can do, it can do not only well but perfectly, and that which it can do best it can do better than the same thing can be done by any other expressive power. But while the poet, with all his range, can never bring the Madonna before the sense, as Raphael has, the painter cannot make the language of visible objects embody the ideas of spiritual or mysterious agency. How shall the painter, for instance, with any resources at his command, give shape to that image, before whose awful presence, as conjured up by the sublime poetry of Scripture language, the heart stands still: "Then a spirit passed before my face; the hair of my flesh stood up: it stood still, but I could not discern the form thereof: an image was before mine eyes, there was silence?" What bold brush could undertake to make intelligible to the sense—what language yet bring vividly before the mind—the burning bush as it appeared to Moses on the Mount? as what mortal music dare seek to utter the "still small voice" that followed it? In fact, this very power of language to do much that the arts generally cannot express, furnishes at once an excellent measure of the controlling power of the imitative principle in the arts, and an indication of the uses to which imitation for the high purposes of art should be devoted. Just because language is the least imitative of all the arts, it is by far the most suggestive. Language can suggest everything that the mind is capable of receiving, from the very fact of its being in no way limited to

the actual sensible resemblance of things, while all the suggestions of art must arise out of the sensible objects which it presents. That art, then, is the highest, which, true to the principles of imitation, rightly understood, that lies at its base, enlarges and spiritualises such imitation by the greatest amount of suggestive thought, but bears in mind, at the same time, that the range of thought must be controlled by the capacity for its suggestion, residing in the imitative language which it is compelled to employ. For this reason it is that all of the numerous art attempts at the personification of the Almighty, under the form of an aged man, are, and must be, by the very conditions of the case, lamentable failures. The supreme and concentrated image of Power and Eternity is here sought to be rendered in forms that suggest the ideas of imbecility, decay and death. Raphael, himself, in his treatment of the Creation, has represented only a venerable old man, toiling and struggling with exaggerated action among rolling clouds. The comparatively unspiritual deities of classic lore were, for the same reasons, fit enough themes for the handling of classic art. The Greek Mythology, which invested the gods with human passions, consistently adopted human forms for their expression, and had thus possible types which these artists might exalt by treatment, instead of the spiritual God whom the noblest treatment must yet lower to the human type. And thus it is that the Greek sculptor could assist the Greek poet in the establishment of certain personifications, composed of distinct and varying attributes, which had all a human reference, but, in their concentration and emphasis, were in each case sublimed by art and poetry into a classic god.

The Essential in Greek Sculpture.

Disciplined observation led the Greek sculptor in his search after the representation of beauty, strength, grace and other attributes, to seize on the characteristic details as he found them in a number of human objects, and these combined into one whole gave the ideal of the type. These sculptured figures now known under the denomination of the antique—while they form the studies for his imitation and examples, at the same time invest the student's mind with ideals of certain attributes and teach him, when in turn he looks to Nature for his models, to detect and estimate the accidents or departure from the beauty of proportion of form or of character with which he must constantly meet in the living example through which he may seek to embody his own conceptions. In the whole range of antique sculpture, with the single exception of what is named the Torso, there are no examples so worthy of consideration as the fragments of art known as the Elgin Marbles. Before their discovery we were obliged to content ourselves either with such treatments of the human figure as are supplied in the eminently conventional forms of the Apollo Belvedere and other embodiments of superhuman character, wherein the departure from fact was intentional and in accordance with the mythological theme to be realised, or with such examples as were presented by the athletic figures of the Fighting and the Dying Gladiators—fine specimens of ordinary nature, and adequate exponents of the ideal of their class. In the mean betwixt these two orders of description—the ideal and the actual—the highly conventional and the literal, we have now in the bodies of the Theseus and the Ilyssus the exact treatment that defines the limits of the essential and accidental—clothing the essential meaning in forms sufficient and best fitted for its expression, controlling detail by knowledge and judgment of the abstract. No particulars are wanting that help the sentiment of action in the one or that of repose in the other of these fragments, while facts so minute as the foldings of the skin are rendered with a truth which, having the moral coefficients so largely expressed, but add their mite to the sum of the imitation. Close study of such examples, as well as of the human and animal forms in the frieze of the Parthenon, will train eyes and understandings for the due estimation of similar objects in nature. No unessential or redundant particulars were permitted to enter into their representation. Wherever in the works of these old Greek masters exaggeration of natural circumstances occurs, it must be accepted as an intentional deviation for a purpose foreign to the theme itself—as a calculation for the efficient expression of the parts, when removed, for instance, to such a distance from the eye as was implied in the place of their original destination.

Phrenology and Art Critics.

Every spectator sees a picture in his own way, and he perceives its different elements with a degree of vivacity and interest corresponding to the development and cultivation of his own mental qualities. The individual who has a low quality of brain and a small development of the organs of form, colouring and ideality, will be little affected by beautiful forms and colouring or even by fine expression; but if he have much individuality and imitation; he may be greatly gratified by minute and successful representations of objects with which he is familiar. If another have large organs of ideality, casuality

and comparison, with a high temperament, but be deficient in individuality and imitation, he may despise imitation as an object of art, and demand grand general ideas, expressed in corresponding forms and colours. A spectator in whom any organ or group of organs is large will recognise and feel interested in the natural language of the corresponding faculties, as it is expressed in the face and attitudes of the figures. Hence men in whom the base of the brain, the intellectual organs, and those of ideality are large, and the coronal region deficient, sympathise with and delight in what they call the fine, vigorous, manly characters of pirates, banditti, boors and outlaws; they are interested also by pictures representing tortures, slayings, and other horrors of human action and suffering, while the truest, most lively, and (to differently constituted men) most captivating expression of the moral sentiments appears to them comparatively flat, stale and unprofitable. If this combination of the organs of the propensities and sentiments be reversed in the spectator, the latter qualities will challenge all his sympathies, while he will turn away with aversion from the former representations. He will possess a tact or instinct by which he will recognise and appreciate certain moral characteristics in living man and in pictures and statuary, to which an individual deficient in the coronal region will be nearly blind. The latter may see them, because he possesses the moral organs to some extent, but his mental sympathies will be as limited as his cerebral development, and his interest will be low in proportion to it. The same remarks may be applied to the individual organs. Each acts spontaneously when representations of its own objects are presented to it, and then it gives rise to its own emotions and impressions. When the impressions are agreeable we call the objects beautiful, when disagreeable we condemn them as plain or ugly, and when indifferent we call them insipid. Hence most persons have some instinctive taste for the fine arts, but it is obvious how each should form a judgment concerning them in some degree peculiar to himself, corresponding to his own special combination of organs and his opportunities of mental cultivation.

Wages at Westminster, A.D. 1291-92.

The rolls furnish interesting information concerning the rate of wages of artificers at the close of the thirteenth century. We learn that the superior masons who were engaged in the years 1291 and 1292 had 6*d.* a day, and that the wages of the others varied from 4*d.* to 4½*d.* and 5*d.* a day; the weekly wages of the apparitor, or foreman, were 3*s.* 6*d.*; the squarers of stone and their assistants were paid from 4*d.* to 5*d.* a day. Wages of the principal smith, 6*d.* a day; of carpenters, from 4½*d.* to 5*d.* a day; of plumbers, 4½*d.* to 6*d.* a day; of tilers, 5*d.* a day. The wages of the painters in those years were as follow:—Master Walter, the principal painter, was paid 14*d.* a day, the others smaller sums, in general from 7*d.* to 3*d.* a day. Two individuals, Andrew (Andrea) and Giletto, probably Italians, had conjointly 6*s.* 8*d.* for six days, and 8*s.* in another week for the same time. Among the articles charged in these accounts are several which clearly demonstrate that painting in oil-colours formed a part of the decorations that were then in progress. Oil and cole and varnish, with white and red lead, vermilion and azure, and sinople are repeatedly mentioned, together with gold and silver (leaf), of which considerable quantities were used. These articles, as Mr. Hawkins has remarked, "could not have been wanted for mere house-painting"; and hence, as well as from the length of time which the artists were employed, he judiciously infers "that the paintings were not even heraldic bearings (exclusively), but human figures; either portraits or ideal representations, and historical subjects, such as were afterwards painted on the walls when the chapel was rebuilt by Edward the Third." From the prices mentioned in the rolls it appears that a "pottle of oil" cost 5*d.* or 6*d.*, a pound of red lead 2*d.*, a pound of white lead 1½*d.* or 1¾*d.*, a pound of tin 3½*d.*, a quarter of azure 1*s.*, a pound of red varnish 3½*d.* and 4*d.*, a quarter of sinople 1*s.*, a pound of green 5½*d.*, 100 (probably books) of gold-leaf 3*s.* 4*d.*, 100 of silver-leaf 6*d.*, and a quarter of vermilion (probably of a hundredweight) 6*s.* 5*d.*

The Inventions of Sir M. I. Brunel.

The circular saw and slide-rest form part of Brunel's series of machines, and he afterwards constructed the former on a very great scale for the manufacture of wooden veneers. To them he added the mortising machine, and these, it will be seen (together with the planing engine), form the staple of the magnificent and varied apparatus with which, driven by the gigantic power of steam, our mechanical factories are now so generally provided. Everyone is, however, aware that Brunel owed his reputation to other achievements as well as his improvements of mechanical tools. The Thames Tunnel will ever be considered as his most arduous triumph. It is a structure of exquisite firmness laid in a quicksand. It will endure like the *cloaca* of regal Rome, when the palace and the cathedral have crumbled

to dust. Yet here also we perceive that it was Brunel's exquisite mechanical tact and ingenuity which enabled him to succeed. The problem of the tunnel is not one of balancing vaults; the static conditions of stability are simple enough, and it was not in the solution of such that Brunel peculiarly excelled. The practical problem was to introduce a rigid tube of brick horizontally into the middle of a quaking mass of mud, and the solution was the invention of a tool which should enable men to make the excavation and to proceed with the building in safety. It was the shield which carried the tunnel under the Thames—a movable vertical frame of cast-iron, provided with thirty-six cells, in each of which a man was placed with a pick to excavate the area required for the construction of the tunnel. By a simple but most ingenious contrivance, every part of the face of unstable clay was firmly supported by boards which leaned upon the frame or shield, which, in its turn, pressed against the part of the brickwork of the tunnel already completed. Each workman could remove one or more of these small boards at pleasure, and excavate a short way into the yielding mass before him, then advance the boards and sustain the slippery face. When the whole face had thus undergone piecemeal excavation, the frame or shield was moved bodily forwards by powerful screws, and the bricklayers brought up the masonry behind, which was then beyond the reach of injury. The idea of the shield was derived, it is stated, from a specimen in the arsenal at Chatham, showing the operations of a testaceous worm which bores under water, and which nature has provided with a protective covering. But the analogy is certainly indirect, since water could hardly retard the operations of such an animal. Repeated irruptions of the Thames several times drowned the work, which was as often abandoned and renewed, but every difficulty was met by fresh resources on the part of the engineer. The failure of funds was a far more serious obstacle, and Government at last came to the aid of an undertaking of such consummate ingenuity that its completion was deemed due to the honour of the nation. The tunnel was commenced on March 2, 1825, and finished March 25, 1843. Brunel survived the completion of his great work above six years, dying on December 12, 1849, aged eighty-one. Scarcely any branch of his multiform profession but received some improvement at his hand. The discovery of the condensation of several gases in 1823, by Mr. Faraday, suggested to Brunel their application as a moving power, and his want of success did not arise from any deficiency on his part of skill or forethought. He was one of the first to construct a roof of extreme lightness, somewhat resembling those now in use for railway stations. He erected a suspension bridge in the Isle of Bourbon on an original plan; and he pointed out with characteristic shrewdness how much of the stability of arches depends upon the cohesion of the parts, so that the vault may in some cases be entirely dispensed with.

Thirteenth-Century Thoroughness.

One thing cannot fail to strike everyone who closely studies our old architecture. In early Norman buildings we often find rude and clumsy workmanship; in works from the middle of the fourteenth century on to the extinction of Gothic architecture we frequently meet with the same—the work of rude untutored hands evidently unable to do justice to their style. But from about 1175 to the end of the thirteenth century and a little later, we scarcely ever meet with this inequality. The art seemed to be all-pervading. Certain buildings may have been plain to a degree and rustic in their object and material, yet you rarely find anything you can call rude in workmanship or unskilful in treatment. It was a great period, and its greatness seemed to pervade even the most secluded districts, and the workmen everywhere to have felt a pride in keeping up the period of their art in which their lot had been cast. Nor need we wonder at this, for everywhere were buildings going on; scarcely a village church escaped the notice of the builders of this wonderful age. The whole country was engaged in the one work of building, and that with an ardent feeling to render their work worthy of the style they had generated. And let us not imagine that the architecture of the age developed itself only in building cathedrals, abbeys or churches of any kind; all other buildings evince the same spirit: a barn of the thirteenth century shows the nobleness of the pervading style as clearly as even the cathedral itself, and what remains of their domestic architecture tells the same tale. Everything was done well, in good taste, and in accordance with reasonable and practicable requirements and the means at command. Nor was it to architecture alone that the arts of the period were devoted: we find the same art expended on stained glass, on metal-work of all sorts, on enamels of the most magnificent character, on the illumination of manuscripts, the painted decoration of the buildings, on jewellery, on ivory-carving, on embroidery, on woven fabrics, tapestry, seal-engraving—in fact on every branch of decoration; every one of which arts were carried out with a degree of skill and instructive taste that was truly amazing.

NOTES AND COMMENTS.

It is not often a claim for commission is heard in the courts that has the novelty which was found in the case *LUCAS v. GABRIEL*, which was tried before Mr. Justice COLLINS a few days ago. The action really arose out of a set of plans for which neither plaintiff nor defendant could be held responsible, and which related to a big building in Dalston known as the North London Colosseum. It was used for a circus and other purposes, but the County Council insisted on alterations which would cost 3,000*l.* and for which Mr. VERITY prepared plans. As a consequence the property was to be sold. The plaintiff put the venture before the defendant, who said he would pay 1,000*l.* if the freehold was obtained for 5,250*l.*, the leasehold interest for 6,250*l.* and a tenant was discovered who would pay 1,200*l.* a year rent and expend the 3,000*l.* on alterations. Mr. LUCAS was fortunate enough to realise all that was proposed, and he received 33*l.* on account, the defendant agreeing to pay a similar sum when 1,000*l.* had been expended on the works, and the balance when they were completed. The incoming tenant also entrusted Mr. LUCAS with the carrying out of the alterations as contractor. For that purpose Mr. GABRIEL handed him some plans which had been received from the vendors, and which were supposed to be those prepared by Mr. VERITY and sanctioned by the County Council. The alterations were commenced. One day the tenant's architect appeared on the scene and declared that what was being done could not be in accordance with the official regulations, and that there was some mistake. As it turned out, the plans did not correspond with those which were sanctioned. The works were suspended pending the preparation of proper plans. The tenant grew alarmed about the delay, and claimed the sum deposited; the defendant, on the other hand, sought to have the agreement carried out. Finally, the dispute was compromised, the tenant received most of the money he paid, and his tenancy was cancelled. Mr. LUCAS claimed his 66*l.* as balance of his commission, and charged the defendant with non-supply of the proper plans, taking possession of the building and compromising the action with the tenant. Mr. JUSTICE COLLINS held that the money was not due, as the alterations were not carried out; that the tenant could have obtained tracings of the sanctioned plans, and there was no default on the part of the defendant; that the lease provided for owner's re-entry, and there was no breach of action in the compromise. Judgment was therefore given for defendant. The case shows how easily one agreement can nullify another, although both have the same intention. If the plaintiff held to the original verbal agreement it could not be set aside, but by accepting a later one, in which the time for paying the instalments was defined and the agreement was made to appear conditional, he lost his action.

EXPERIMENTS were lately undertaken at Sibley College, which forms part of the American Cornell University, to ascertain the extent of the loss of heat by radiation from the steam-pipes employed for warming the buildings. There are about 150 feet of 10-inch and 2,050 feet of 6-inch pipe, all laid underground. The piping is protected by placing it within rings, formed by boring out sections of logs, the holes being large enough to leave an air-space of nearly 1 inch around the pipe. The thickness of the wood is 4 inches. The outside of the wooden pipe is wound spirally with hoop-iron and coated with hot coal-tar and sawdust. Measurements showed that pipes protected in this manner lost only about 31 per cent. as much heat as those uncovered. Another series of tests were made at South Plainfield, where a number of engines at different points are supplied with steam from a single boiler plant through 747 feet of 4, 5 and 6-inch pipe. This was placed in a covering consisting of two concentric octagonal pipes, each built of 1-inch plank, and separated from each other by a very thick layer of waterproof paper. The steam-pipe passes through the centre of the wooden pipe, and is surrounded by a half-inch air-space. On account of the wet soil and the difficulty in securing proper drainage, the pipe was left on the surface of the ground and protected by a rough box of 2-inch plank. The experiments showed that this covering reduced the loss of heat to about 8 per cent.

of what it would have been with naked pipe. These figures are considered to show that it might be found economical, in cases where comparatively small quantities of steam are to be used in different places not too far distant from each other, to employ a central boiler plant and transmit the steam through protected pipe. It is without doubt possible to generate steam more cheaply in a single large plant than in a number of smaller ones, and if it can be demonstrated that the loss in transmission through covered pipes can be reduced to less than that involved by shafting, belting or electric motors, a strong argument in favour of the system is apparent.

THE hopelessly ignorant condition of the average country health-board in America is shown in a recent report of the Connecticut State Board of Health, quoted in the *Engineering Record*. The State Board had occasion to try to find out something about the way in which sewage was disposed of in the various towns, and accordingly addressed inquiries to the local health boards, with the results that might have been expected. One official reported that the sewage in his town was mostly "fed to pigs"; while, in another, it was "either spread broadcast on gardens" or allowed to run into "a low spot," "for the hens to drink." A third health officer gave the valuable information that "there is no sewage in town;" and a fourth found that in his district there was "no sewage to dispose of." Another reported that "nature took care of" the sewage in his town, and several described their systems of sewage disposal as "natural," or as "the ordinary method;" while one went into particulars about the "ordinary method," by explaining that the sewage is "washed away by the rains."

THE prizes which are annually given to young French artists have been again divided between exhibitors in the Salon and in the galleries of the Champ de Mars. There were seven competitors for the Prix de Paris, viz. three painters and four sculptors. Out of the thirty-seven members of the Conseil des Beaux-Arts who were present thirty-three voted in favour of M. MAURICE ORANGE, whose painting, *The Defence of Saragossa*, in the Salon, has been awarded a medal of the second class. Three "bourses de voyage" have been given in the sections of painting, sculpture and architecture, and one in engraving. The fortunate architects are MM. EDOUARD BAUHAIN, JULES GODEFOY and PAUL NORMAND, who are exhibitors in the Salon.

THE memory of the late FRIEDRICH SCHMIDT, who was for many years accepted as the leading architect of Vienna, is not to pass away as quickly as is common with artists of his class, as there is to be a memorial of him erected in the city he adorned. SCHMIDT's pupil and associate, Professor DEININGER, has agreed to be responsible for the architectural part, and a competition was opened to obtain models for the statue. There were thirty-two sent in. The first premium has been awarded to Herr HOFFMANN, the second to Herr SEIFERT and the third to Herr CHARLEMONT. Professor DEININGER in his architectural details has endeavoured to suggest that peculiar treatment of Gothic with which SCHMIDT's name is associated, and which seemed to be better adapted for cast-iron than for masonry. The only obstacle to the realisation of the design is the want of money, for so many memorials are projected the Austrians say they cannot pay for all.

WE have received a prospectus of the Photographic Salon to be held at the Dudley Gallery in October next. The exhibition is to be devoted exclusively to pictorial photography as opposed to the customary arrangements of a mixture of mechanical apparatus or scientific exhibits, with such illustrations as belong to a picture class pure and simple. The committee formed to carry out this object include the leading exhibiting photographers, both professional and amateur, in the United Kingdom, as well as representative workers in pictorial photography abroad. One aim of the exhibition is to remove the misconceptions and unjust prejudices which exist as to the power of photography to make artistic representations.

Residence for
— Dr. Saml. Aspinwall —
— Lichfield Road —
Edington

Messrs
Essex, Nicol & Goodman
Architects
Birmingham







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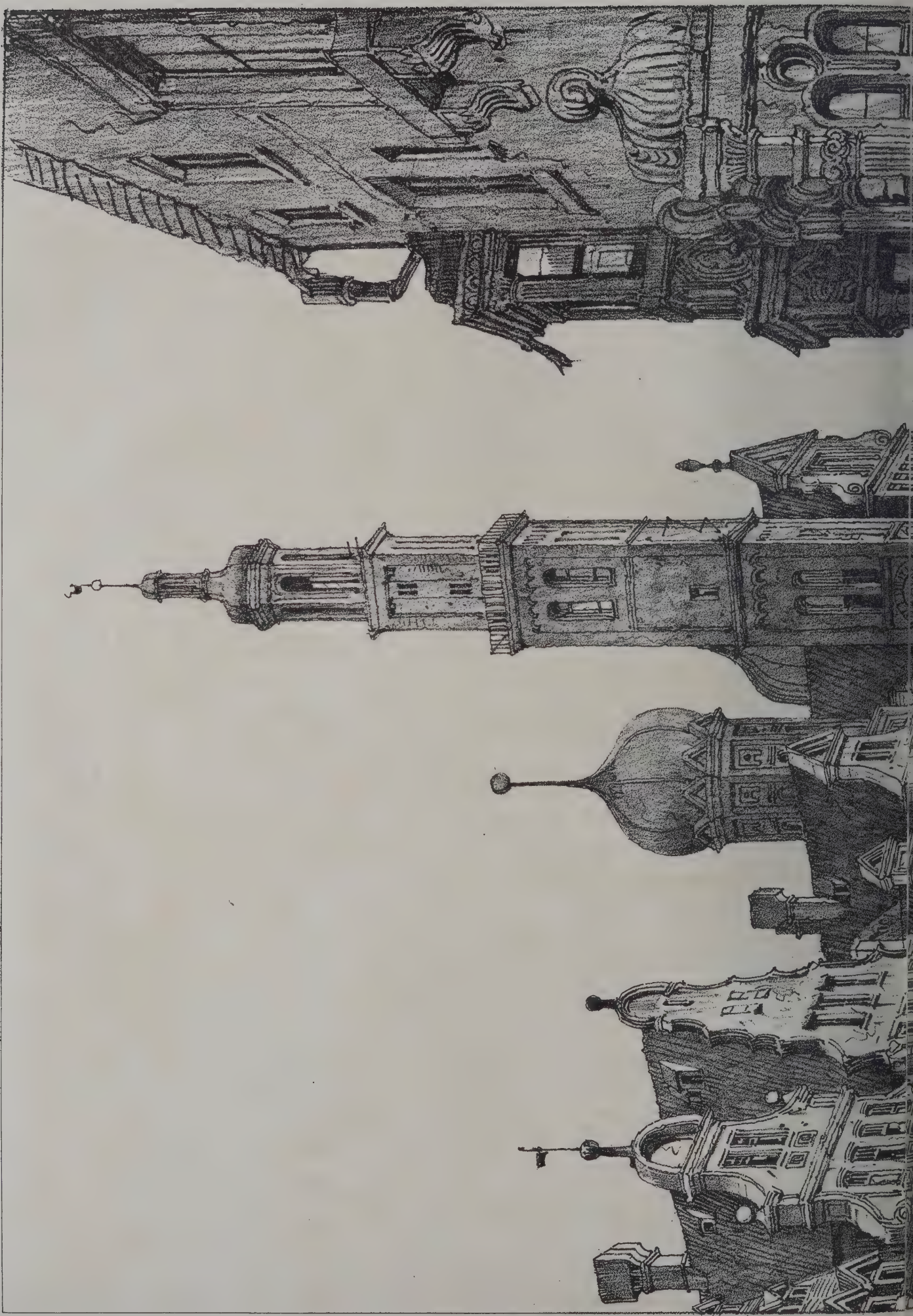
NEW RESIDENCE, WOKINGHAM, FOR H. B. BLANDY, ESQ.
A. W. WOOD CO. LTD. Architects

The Architect, June 30th 1893.



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SHOP AND DWELLING, TOTTENHAM COURT ROAD.
FREDERICK WALLEN, A.R.I.B.A., Architect.





AUGSBURG

AUGSBURG.
Drawn by SAMUEL PROUT.

PHOTO-LITHO. SPRAGUE & CO. 4 & 5, EAST HADING STREET, FETTER, LANE, E.C.

ILLUSTRATIONS.

NEW RESIDENCE, WOKINGHAM.

THE residence which forms one of our illustrations to-day is in course of erection for Mr. H. B. BLANDY, on an elevated site near Wokingham, Berks. The facing bricks are of a deep-red tint, specially selected from Messrs. LAWRENCE & SON'S kiln at Bracknell, with ornamental tile-hanging and moulded-brick cornices, &c., to first floor, and half-timber oak-work in gables filled in with thin bricks laid to pattern. Dark tiles are used for roofing. The contractors are Messrs. BOTTRILL & SON, Reading, and the architect Mr. GEO. W. WEBB, F.R.I.B.A., Market Place Chambers, Reading.

SHOP AND DWELLING, TOTTENHAM COURT ROAD.

THIS house has been erected for Mr. JAMES ELMY, china and glass merchant, at the corner of University Street. The materials of the front are red brick and Douling stone. The site is about 48 feet by 19 feet 3 inches, the basement used for warehousing extending 12 feet in addition to these dimensions. The contract for the building was 2,300/., and for the vaults under street 515/., and the total cost is about 3,000/.. The architect is Mr. FREDERICK WALLEN, of Gower Street, and the builders Messrs. TITMAS & SONS, of Grafton Street.

RESIDENCE, LICHFIELD ROAD, EBDINGTON.

THIS residence is now being erected for Dr. ASPINALL by Messrs. BISHOP & CHARLES, builders, of King's Heath, near Birmingham. The elevations are being carried out with light-coloured red bricks and red Hollington stone dressings; the ornamental brickwork and quoins are of cherry red Bracknell rubber bricks, and the roofs are covered with brown brindled tiles. The work is being carried out from the designs and under the superintendence of Messrs. ESSEX, NICOL & GOODMAN, architects, of Birmingham and London.

AUGSBURG.

TYTTENHANGER HOUSE.*

THIS interesting house, which by courteous permission we have the pleasure of visiting, has attractive historical associations. Its predecessor, as is well known, was a favourite residence of the Abbots of St. Alban. The manor was one of their earliest acquisitions. On this Mediaeval portion of our subject I have to offer a few prefatory notes.

At some period before the Norman Conquest a certain religious matron, Thurefleda, gave this estate to St. Albans ("in perpetual alms"). In the record (Cott. MS. Nero D. vii. fol. 90) it is called *Scenlea* (Shenley), i.e. land in Shenley. Also in the Domesday Survey it is described as if it were part of the Manor of Shenley:—"The Abbot holds Scenlea—it is rated at six hides—in demesne are two hides." The other portion of Shenley, clearly the principal manor, is rated at eight hides, and was held by Geoffrey de Mandeville. That the Abbey Manor in Shenley is identical with Tyttenhanger is a matter of inference. In the charter of Henry III., and subsequent charters cited in the confirmation charter of Edward IV., Shenley is not found; Tyttenhanger (Tidehangra) is found, and in the enumeration of the manors the latter seems to take the place of the former. For the correctness of this identity we may trust the county historians. The manor is situated in the parish of Ridge, and, according to my information, is nearly co-extensive with it. This is of a peculiar shape, being (according to Mr. Cussans's description) a long strip of land, about three-quarters of a mile wide on the average, and extending nearly ten miles north and south, the southern limit bordering on Dyrham Park, wedged in, as it were, between the parishes of North and South Mymms on the east and Shenley on the west. This is rather suggestive of the idea that it once formed part of the parish of Shenley, and was afterwards detached. At the time of the Domesday Survey the church of Ridge may have been a chapelry to Shenley, as we found Flamstead had been originally a chapelry to Redbourn. Sandridge was also once a chapelry. At what period Ridge became a parish cannot be known; its name does not appear in the abbey annals till the fifteenth century. No rectory is known; the rectorial tithes were held by the abbots, and were appropriated, probably at a very early period, to the office of the almoner. The almoner's tithes in Tyttenhanger were leased out by Abbot Robert

Catton in 1538 (Mr. Cussans quotes the document). These afterwards came to the Crown. "Tyttenhangre" was certainly an early appellation of the manor, probably in Saxon times. What does the name mean? The county historians give us no help. I will offer a suggestion. In the charters it is spelt Tidehangra. In the Book of Benefactors it is Tytynghangre. The last part of the word is clear. Hanger is an old name for a hanging wood, i.e. a wood growing on a declivity. Such woods exist still round about Ridge (Rugge), which, as the name denotes, is the high land of the manor. The level near Ridge Church is about 400 feet above the sea, according to the Ordnance Survey. Other hangers forming place names are Pans-hanger, near Hertford (probably Paynes-hanger (Payne being a personal name); and Osten-hanger in Kent. There are also some other instances in Norfolk. But what is the first part of the word? I believe it is tithes or tithing (tything). Tide-hangra and Tytyng-hangre are almost identical with Tithe-hanger and Tything-hanger, the former resulting from a rapid pronunciation of the latter. Thus the name would signify the tithes hanging-wood, or the tything wood. We may compare such names as Tithe-cote (the tithes cottage) in Devonshire, and Titherby (the tithes dwelling) in Nottinghamshire. What such a wood had to do with the tithes or tything I will not undertake to explain.

One feature of the lord's demesne, located here in the northern part of the manor, is the extensive moorland or heath. The name "Colney Heath," signifying "the heath of the Coln island," intimates its marshy character; it is still subject to floods. The abundant supply of water for forming fishponds was one of the advantages which attracted the notice of the abbots to this spot; others were the fertility of the soil, the richness of the pastures and the beauty of the woods. For these reasons, it is stated, Abbot John Moot designed to erect here a spacious country residence about A.D. 1400. Some of his predecessors had shown a special partiality for Tyttenhanger. Abbot Hugh de Eversden acquired about 100 acres here from John de Rammesden before 1326 ("Gest. Abb." ii. 122). Abbot Richard de Walyngford rebuilt the manor house about 1335. His successor, Abbot Michael de Mentmore, when spending his leisure here, found himself invaded by flocks of visitors, owing to the proximity of his residence to the high road to the north (the ancient pack-horse road which passed near). Consequently he removed to the manor house of Bradeway, which he put in repair, with the chapel (Mr. Cussans conjectures this to be another name for Maudelyns, in the parish of Northchurch, where the ruins of the chapel still remain). The abbot then demolished Tyttenhanger and sold the materials, c. 1340 ("Gest. Abb." ii. 371). The house seems to have risen again soon after, for Abbot Thomas de la Mare lodged here in 1350, on his return from Rome and before his instalment in the Abbey Church. The annalist reckons it among the faults of this abbot that he allowed this manor house to fall into decay. His successor, Abbot John Moot (as I have already stated) commenced the erection of a mansion on a larger scale and perhaps on a new site, suitable for the accommodation of his retinue and guests. He had previously erected two granges here. Part of the old house was habitable till his death in 1401, for the abbot was here in his last illness, and was removed in a litter to die in the monastery. He had done little more than lay the foundations, on which he expended 60/. Abbot William Heyworth continued the work, and completed it in six years, about 1408. The chronicler states that it was reputed to be the finest monastic country residence in the kingdom. We may suppose it to have been constructed of flint and Totternhoe stone; the precinct was enclosed by a moat. The moat appears to have been filled up about the beginning of the present century (Brayley). Its existence is now forgotten. Abbot Heyworth stocked the fishponds. His successor, John of Wheathampstead, added to the fame of the mansion. In his first abbacy he enlarged the chapel and inserted stained-glass windows, which cost 16/., (perhaps equivalent to 200/., in present money). Wever informs us (on the authority of a destroyed MS.) that on the walls, perhaps the wainscot, "he caused to be painted the similitudes of all the saints of his own Christian name John, with his own picture, which seemingly thus prayeth":—

Cum fero par nomen, par ferre precor simul omen;
Tum paribusque pari, licet impar, luce locari.

He also repaired the study, wherein, says Wever, he inscribed verses. A considerable portion of the ancient wainscotting is to be seen in the present house.

The abbot transacted a good deal of business here in his leisure hours. In 1462, July 3, he signed a presentation to the vicarage of Rudge (Ridge), having collated James Waleys, chaplain, on the recommendation of Henry Frowyk, Esq.; the previous vicar, John Bernard, had been indicted for treason, and taken to flight (Regist. J. W. ii. 12). This was during the Wars of the Roses. In 1429 he brought to a happy termination a controversy with a powerful neighbour about the manor rights. Thomas Knollys, lord of the manor of North Mymms,

* A paper by the Rev. H. Fowler, read at Tyttenhanger House on the occasion of the visit of the St. Albans Antiquarian Society, and published in the *Herts Advertiser*.

had long claimed to exercise in alternate years the right called "the indrove of cattle" on Colney Heath (otherwise called Tyttenhanger Heath). The indrove was the driving of the cattle grazing on the common into the manor pound, for the purpose of ascertaining whether any of the owners were subject to a fine on account of their not having grazing rights. The claim seriously affected the abbot's prerogative, but he had an object in view for which he thought it worth while to make some sacrifice. Accordingly at an interview held here he offered Knollys a compromise. His speech was a very polite one; the business part of it was to this effect:—"Sir, I will concede your claims and also allow you to enclose ten acres of wood, called 'Le Hoke,' provided you will make no opposition to my enclosing thirty acres of the heath; I refer to that angular plot which adjoins the grove which we call 'Conynghe,' opposite to my mansion." The offer was accepted, the indenture, which contained other minor stipulations, was drawn up and signed in the chapter-house of the abbey, April 1, 1430. The abbot's purpose was to form a deer-park, which he now effected after removing his tenants out of the enclosure ("Amundesham," i. 260). His satisfaction was expressed in a poetic effusion which we may entitle, "The Delights of Rural Seclusion at Tyttenhanger." The limits of the deer-park on the north-west appear to be marked by a place which retains the name of Park Gate Corner. In 1470 Abbot William Albone, while staying here, presented to the vicarage of St. Margaret de Rudge Thomas Thikthorpe, chaplain, October 12. His successor, William Walyngford, was frequently in residence, and signed many documents here—marriage licenses, grants of presentations, and various monastic appointments, e.g. the grant to Lord William Hastings to be seneschal of the abbey, dated "at our usual residence of Tyttenhanger, December 20, 1479." In July 1478 the abbot entertained here for six days the Papal collector, Master John Giglis, with his chaplain and six attendants; his visit was one of recreation (Regist. ii. 211). After this the monastic annals fail to afford information, with the one meagre exception of a record of rental of lands acquired (here) by Abbot Ramryge, in 1506, viz.:—"From Robert Nycols, for five crofts of land and the wood called Priors, and two crofts called Mylgrove, and two lofts called Pagys in Ruge, lately belonging to Thomas Deyer, 16s. 8d.; also rent of a tenement and lands in Ruge, lately John Ashleye's, 21s. ("Amund." ii. 251).

The last incident I can discover of monastic times, which is one of some interest, occurred in 1528, the 20th Henry VIII. For this we are indebted to Holinshed's chronicles. The narrative is as follows:—"In the end of Maie began in the cite of London the disease called the Sweating Sickenesse, which afterwards infected all parts of the realme, and slue manie within five or six houres after they sickened. This sicknesse for the manner of taking the patients was an occasion of remembrement that great sweat which raged in the reign of this King's grandfather; and happile men caused the same remedie then used to be reniued. By reason of this sicknesse the tearme was adjourned, and the circuit of the Assizes also. There died diverse of the Court of this sicknesse. . . . The King for a space removed almost every daie till he came to Tintinhanger, a place of the Abbot of Saint Albans, and there he with the Quaene and a small companie about them remained till the sicknesse was past." The queen at this time was the ill-used Catharine of Aragon; the abbot was Cardinal Wolsey. By a comparison of dates it appears that he had some time before this received the king's instructions to move in the matter of the divorce. Possibly Holinshed is mistaken with regard to the queen being of the royal party at Tyttenhanger. However this may be, the visit, which was probably a long one, is some evidence of the spaciousness of the Mediaeval mansion.

AMERICAN SILVERWORK.*

By H. TOWNSEND.

(Concluded from page 414.)

AS an Englishman I cannot help experiencing a sort of vicarious shame when I go into shop after shop, house after house, and see the same painfully glittering and meaningless surfaces, the same commonplace curves, the same lifeless ornamentation, and compare them all, in my own mind, with the constant delight and pleasure I experienced in New York as I turned over the contents of an ordinary shop show-case, or called upon some friend whose acquisitive faculty had led him in the direction of silver ware. Here in England we are content, not so much to endeavour to revivify a corpse, as to hospitably entreat and to be perfectly satisfied with the presence at our feasts of the mere mummy of an art. To travel out of the path beaten by the hammers, or the rut cut by the gravers of two centuries ago, seems to the English smith not

only useless, but positively vicious. His fashions may change, perhaps, but they change only as regards the model he is content to slavishly follow. When he is a copyist he is too often soulless; when he summons courage enough to be original he is generally mindless. In America, on the contrary, he is ever on the look out, not only among the archaeological dustheaps of the centuries, but in the world of science of to-day and in the almost newly-discovered world of still living Oriental art. From science he has borrowed many a secret of metallurgy. From the East, and from Japan especially, he has learnt many a lesson of form and colour. He has pressed into his service, sometimes, I own, with unwarrantable rapacity, the methods of other arts. He has not been content to simply engrave the surface of his metal, but has yearned for and obtained the freedom and facility of the etcher's needle. As regards this liberal and broad-minded subjection to outside influences, there is much that is worth consideration in the different attitudes which the English and American silversmiths have respectively assumed towards the marvellously beautiful and ingeniously scientific alloys which, under the names of shibu-chi and shakudo, the Japanese have known and cunningly worked for centuries; or towards the equally beautiful effects gained by the same artificers through the use of patinas, which give to silver and its alloys a bloom as of a sun-kissed peach or ripened plum. The English have passed them by with timorous indifference: the Americans have spent large sums of money and an affinity of thought and care, and while deftly refraining from any servile copying, have adapted rather than translated these foreign arts into their own language. You will see two or three examples of the curiously welded alloys to which I refer among the little collection here, and I would beg you to especially note that while the Japanese influence is undoubtedly strong, none of the pieces I have here could by any possibility be mistaken for examples of native Japanese workmanship.

It is, in fact, the strong desire of the American workman to avoid any appearance of actual copying, while I am afraid his English brother, supposing him to have the necessary skill to work in so ingenious a fashion, would use his utmost endeavour to turn out something which, in its imitative fidelity to the original, should deceive an expert Japanist. Even when he does not care to expend the time and labour necessary to produce these beautiful but necessarily expensive articles, the American silversmith has an eye for colour, and for the effects of contrast, which is apparent in some other of my examples.

His employment of copper, not in any secondary position, nor necessarily as a base metal, but as having a beauty of colour entirely its own—a beauty which may well be enhanced by the apposite radiance of the white metal—is as frequent as it is happy. The coffee-pot of Gorham manufacture, for instance, which you see here, is not by any means a perfect example of design, but it has, I consider, an amount of interest which would be altogether absent were it constructed entirely of the one metal. That the surface patina, produced by the slight oxidation of time, is an important factor in our admiration of unique metalwork, has also been fully recognised by the Transatlantic craftsman; and though I must confess he has carried this trick to an extreme in some cases, he has in others employed it with rare skill and good judgment. This fault of excess may be laid to his charge also in regard to the etching—of which I have before made mention—but that he was able to appreciate the value of a free as compared with a mechanically restrained incised line is certainly a point in his favour. In regard to this, I cannot resist telling a little anecdote which I only heard last night. An American friend of mine had a very dainty cigarette-case, etched with a freely-treated design of thistles, decoratively treated. The lines were coloured in a niello-like fashion, with a very soft and beautiful brown, a colour which gave value to and agreeably contrasted with the grey of the not too highly polished silver surface. She wished to have made here in London a writing-case to match her thistle-adorned cigarette-case, and to this end consulted one of the most eminent firms of silversmiths in London. They had never heard of etching upon silver, and did not believe it could be done, but they had no doubt they could engrave it to her utmost satisfaction. She debated with them upon this question of etching *versus* engraving, but to no purpose, and finally sent them the cigarette-case as a model, and trusted, somewhat feebly, for the best. Her writing-case arrived home, with stiffly-engraved commonplace thistles dotted here and there over its hopelessly-burnished and brilliant surface, and with it arrived what was once her beautiful cigarette-case, beautiful, alas! no longer. It looked like a piece of scratched and defaced tinware. When, breathless with indignation, she sought an explanation from the manager, she received the suave assurance, "You see, it looked so dirty that we thought you would like us to clean it nicely, so as to match our own work. I can assure you," he added, "we had to use strong acid in order to remove the ugly brown stains."

But I do not wish to give the impression that the American silverworker is wholly given up to what some of us may con-

* A paper read in the Applied Art Section, May 30, and published in the *Journal of the Society of Arts*.

sider his fads and affectations. He can meet the Old World artist upon his own ground, and equal, if not excel him. I think the best work we have in this country is that in which *repoussé* work is largely employed. I have a little toilet set, which has been kindly lent to me by the friend whose cigarette-case was so unkindly treated, which will show that the American *repoussé* work is not to be despised, though I by no means put it forward as a perfect example of its class. This little box, though chosen quite at haphazard, is evidence that while the mechanical skill displayed in their work is quite as great as that of our own hammerers, in freedom and individuality of design they are superior; while in the work with the graver, which may be said to add the cachet of distinction and personality to all good *repoussé*, they are, among modern workmen, unrivalled. Nor when they endeavour to work in a strict archaeological style are they at fault. What I have said concerning their adaptation from the Japanese holds good also as regards their treatment of Renaissance forms. The bag-clasp which you see here is an instance of this, trivial and slight though it may be. It is quite in the manner of Italian sixteenth-century work, as you will see, and yet with a distinctively modern note running through it. The little figures seem to me designed and modelled with a marked degree of graceful freedom, and yet of precision, while the cartouche of the buckle is in itself a lesson in little of the advantage of working in the spirit rather than according to the strict letter of a formal style.

I should also like to call attention to the pierced work, which, in its combination with glass, is so characteristically American. The flask you see here is an example of what I mean, and illustrates fairly well the manner in which they apply the methods of the old-time artists in metal to our nineteenth-century requirements. Nor have the Americans forgotten that they are the inhabitants of a country richly endowed with forms of natural life, which may be conventionalised and adapted to decorative purposes. The terrapin, the snail, and the bison have all been pressed into service with more or less success as decorative *motifs*.

I have been endeavouring, in sufficiently brief fashion, to impress upon you the fact that one at least of the arts of a country we are far too apt to consider as given over to the outward barbarian is worthy of our most respectful consideration. But let me insist that anything I may have said which appeared derogatory to our English work is meant to apply simply and solely to those articles of silver ware which any one can buy in any Regent Street or Bond Street shop, and on the other hand, all that I have brought forward in favour of the American work, as compared with our own, is confined equally to the same class of articles.

I have seen in England specimens of artistic work in silver and other metals which will compare most favourably with the creations of the cinque-centists and Mediæval metal-workers, but also invariably this work has proceeded from the studios of sculptors of eminence, or from the workshops of amateurs. I am not, of course, so foolish as to belittle the marvellous creations of such an artist as Mr. Gilbert, or even to undervalue the skill of Professor Herkomer, who at his house at Bushey has for some time been producing to his own design a service of carefully-modelled silver, which has much of originality to commend it.

In one respect, however, I may say a good word for our countrymen at the expense of the American. Ecclesiastical silver ware is to be found in some workshops here which cannot be paralleled either in America or in any other country in the world for its adherence to the best traditions of the Mediæval craftsmen. It is more than archaeologically correct, it is alive with the true spirit of the devotionally-minded silver-workers of an age when religion permeated the life of the artisan as well as of the priest. It is worth noting, by the way, that the same holds true as regards their architecture also. The American church work cannot be compared in any respect to the best of ours, though some of us are bold enough to consider that in domestic and commercial buildings they have a great deal to teach us.

Finally, let me endeavour to sum up the differences which I conceive exist between the silverwork of our own country and that of the world beyond the ocean. Here the workman is hidebound and fettered by tradition and trade custom. There he freely enlists into his service all that may in any way render his work more interesting or more individual. How much of this is due to the care that is taken in America to educate the workman in the art as well as the mere technique of his craft I am unable to say. Certain it is that a firm such as that of Tiffany, to which I have so often referred this evening, has made it a point not only to choose its apprentices and workmen from the more intelligent classes of the community, but have insisted on the necessity of their acquiring an education at the drawing-board as well as at the bench. To this end they have established special schools of art within their own little community, and their example has been widely followed by other leading firms. Nor should it be forgotten that of the purchas-

ing public of the two countries each has its own peculiarities, and I think the American silverworker, who desires to cultivate art for art's sake, meets with greater encouragement, financial as well as otherwise, from his clients. At the same time this indifference to novelty and individuality is one that acts and reacts. Our silversmiths here declare that they are never asked for anything more than commonplace conventionality, but, on the other hand, they make not the slightest attempt to lead the public off the well-beaten path.

We are distinctly not an inartistic nation, and especially so as regards the applied arts, and the cordial encouragement which, in spite of all growls to the contrary from some of our leading decorators, I venture to assert, has been given to the creators of a new school of applied design in woven and printed fabrics, pottery and ironwork, leads one to inquire, with some degree of plaintiveness, whether it is not time for us to take a step forward, in what should be one of our more characteristic, as it has been for centuries one of the most carefully cherished of our minor arts? May it not indeed be this very coddling and swathing up in bands of soulless tradition that has nearly stifled out its life, and if, even though it be at some loss to our self-esteem, we gain a breath of free air blown to us by the winds which set from off the shores of the New World, may we not look for a cordial acceptance of the new teaching by our art-loving English people?

ARCHÆOLOGY OF THE LEOMINSTER DISTRICT.

THE second excursion of the archaeological section of the Midland Institute took place on Tuesday and Wednesday in last week to the Leominster district. Arriving at Tenbury, says the *Birmingham Post*, the party crossed the river Teme by an ancient bridge, the original arches of which are ribbed, semi-circular in shape, and probably Norman in date, but they are nearly hidden by modern overhanging iron footpaths on each side, entering at the other end of the bridge the little town of Tenbury. Very little now remains of the old town, and the ancient church was nearly destroyed by a flood in 1770, and has been rebuilt in an ornate Gothic style. In the chancel, however, under a beautiful fourteenth-century canopy, lies a diminutive effigy of a cross-legged knight in chainmail. His hands were especially noted, as they are bare and hold a heart between them, and the mufflers of mail hang loosely from the wrists, being in this respect probably unique. The whole forms a fine example of a heart-shrine, and doubtless contains the heart of some knight who fell in the Crusades. Another mail-clad warrior (but this is an exceptionally large one) is partially built up in the wall of the south side; the legs are crossed, and he has a shield bearing the arms of the Sturmeys. In the same aisle is a very elaborate tomb, richly carved in alabaster, with a knight in Elizabethan plate armour, and his lady in the costume of the same period. There is an inscription showing it to have been erected by Dame Joyce, who married Sir Thomas Lucy of Charlecote, to the memory of her parents, Thomas and Mary Acton. Attention was also directed to the vestry, over which has been a room with a window opening into the chancel, doubtless for an anchorite or hermit, and to the tower, which retains its Norman character even to the belfry windows.

Returning through the town and recrossing the bridge a large tumulus near the river with three fine oaks upon it was examined, and the theory hazarded that it had been originally intended to mark the ford at that spot. Burford was reached in about a mile, some astonishment being expressed by those who had known the church a few years ago that the simple village fane of those days had been converted into a gorgeous piece of modern architecture by the architects of the Birmingham Law Courts, which building it strongly recalls. The old tombs, however, were always its strongest point, and these were carefully studied. The earliest is a deeply-incised brass within the chancel rails with the figure of a lady upon it. The Norman-French inscription being partly obscured, its date was gathered from the costume to be in the last half of the fourteenth century. Under a fine sepulchral arch, which may have been erected for the Easter sepulchre, is a well-preserved stone effigy of a lady, the Princess Elizabeth, sister to Henry IV., who died in 1426. Near it is a wooden effigy of a knight in plate-armour to Edmund Cornewaylle, who died in 1508. The colour of these effigies has been restored. On an altar-tomb, whose upper surface is a sheet of lead, is incised the effigy of a lady, Elizabeth Debroke, under a curious canopy. It is evidently the work of a maker of incised alabaster slabs. On the north side is a monument in the form of a triptych, externally painted with representations of the Apostles. Within are three figures, life-size, in Elizabethan costume, Edmund Cornewaylle and his father and mother. There is a corpse depicted below, and many coats of arms. Wonderful stories are told of the size and strength of this Edmund, who is painted 7 feet 3 inches in height. There are but two other such

triptyches in the kingdom. Round the chancel walls many other interesting tombs were noted, one to a lady who "lived to see seventeen score and more children raised from her body." Under a pointed arch in the south wall are two cavities with loose lids, another instance of the custom of enshrining hearts in the walls of churches, this one containing the heart of Sir Edmund Cornwaylle, who died at Cologne in the fourteenth year of Henry VI.

From Barford the drive was resumed through delightfully picturesque country, commanding grand views of the Clee Hills, to Whitton Chapel, which stands by itself among the fields. Its earliest feature is a Norman square door with plain tympanum, and it has a very plain square tower lighted by loopholes, and a few windows of the fourteenth century. About a quarter of a mile beyond, the old park wall and fine groups of gables and chimneys of Whitton Court are visible, a remarkable mansion of great beauty, externally built of the small bricks and stone quoins of the sixteenth century, but containing within the remains of a much more ancient and very interesting house of the fourteenth century. Situated in a park of considerable variety and extent, it stands on the edge of a small ravine, and is so clothed with ivy and creepers and so supported by groups of trees as to form a most delightful group from any point. Passing into a late brick porch the bold fourteenth-century arch of the door was noted, and within the extraordinary massiveness of the oak screen across the end of the great hall, also of the fourteenth century. The fine old furniture and valuable tapestry of the chief rooms were greatly admired, also the quaint quadrangle with its rich timber work.

The party next drove to Leominster. After supper the Priory Church was visited, under the guidance of the Rev. A. G. Edouart, vicar of Leominster. The church originally belonged to the monastery founded by Leofric, Earl of Mercia, hence the name Leominster. The late Sir Gilbert Scott, who superintended the restoration of the church, at a total cost of over 10,000*l.*, believed that the Norman portion of the church was standing before the Conquest; it certainly existed many years before the foundation of Hereford Cathedral, and is said to have been the mother church of the whole district. In point of antiquity it undoubtedly ranks with the oldest church now existing in the kingdom. The eastern portion of the original Norman church was entirely destroyed at the time of the dissolution of the monasteries, and has never been rebuilt. During the thirteenth century the Norman nave was used as the parish church, but the inhabitants, falling foul of the monks, were excluded from it; and for their accommodation a stupendous south nave was erected in place of the old Norman south aisle. Early in the fourteenth century a third nave was added. The church contains many objects of great interest, among others a consecration cross, some ancient encaustic tiles, and a fine chalice of pre-Reformation date.

After breakfast on Wednesday morning the drive was resumed through country of flat pastoral character to the village of Kingsland, whose picturesque cottages straggle for a mile along the high road. The church here is one of remarkable interest, having nave, aisles, tower and two porches in the Geometrical Decorated style of the earliest part of the fourteenth century, only one window being a century earlier. The clerestory windows of circular design are almost peculiar to this part of the country, and occur again at Pembridge. Opening out of the north porch, and having a window into the church, is a diminutive chantry chapel of great beauty, in which is a well-preserved stone coffin, under a richly-treated arch. On the east gable of the nave is a good example of the sanctus bell-turret. The Rev. T. G. Baillie produced a remarkably well-preserved and early volume of registers, and gave an interesting account of the chapel. Passing through Kingsland village, which contains many picturesque houses, and crossing the Roman Watling Street and the celebrated battlefield of Mortimer's Cross, where a pillar commemorates the sanguinary conflict between Yorkists and Lancastrians, the picturesque park of Shobdon Court was soon entered. Through this fine mansion, in the Louis XIV. style, the party was shown personally by Lord Bateman, and the building was eagerly examined. A perfect treasure-house it proved, teeming with objects of art and family portraits of great interest. The church was then visited and mingled feelings aroused by the extraordinary and probably unique example which its interior presents of the earliest Gothic revival, a result, probably, of the friendship of a past Lord Bateman for the designer of Strawberry Hill. A fine Norman font and the fine matrix of a brass in the churchyard aroused much interest, and ascending a slight eminence in the park a group of singular arches proved to be the remains of Shobdon Priory, removed from the site of the present church in 1752. Mr. Parker, the well-known architectural authority, has pronounced them to be "altogether one of the richest examples of Norman sculpture in existence." Shobdon Priory was founded in 1141 by Oliver de Merlimond, steward to Hugh de Mortimer; but the canons removed some miles further north and built Wigmore Abbey. A steep drive

was then descended into the village of Shobdon, which had not interest enough to call for a halt, and thence across the valley to Pembridge, which is now more than a village, and was in ancient times a town. Many old timbered houses and the steep roofs, tall and graceful windows and curious bell-tower of a grand old church, give the place quite a continental look, although the bad taste of owners has in many cases given a brick front and a slate roof to otherwise ancient houses. Dinner having been served at the Greyhound, itself a fifteenth-century house of timber, the village was explored. An old manuscript among the church records says that the town had a charter from Henry I., but that the market was then (1675) declining. The market hall is still standing in an open space surrounded by old timber and plaster houses, and is a very quaint and exceedingly picturesque object, being simply a hipped roof of stone tiles with moulded capitals and bases supported on a number of massive oak columns. In examining the church the party had the advantage of the guidance of the Rev. T. J. Hewitt. It is of great size considering the present population, and with the exception of a thirteenth-century column now built up in the chancel wall and a very fine thirteenth-century font, the building is entirely of the fourteenth century. It contains some fragments of original stained-glass and four fine freestone effigies—a local lord in civilian dress, his wife, a priest in unusual vestments (showing him to be a canon, or perhaps a dean), and a lady dressed like a nun, all of the fourteenth century. A very fine carved oak pulpit, altar-rails and carved pews of the seventeenth century, a fine brass chandelier of the early eighteenth, and unusually perfect registers, going back 300 years, were examined. A supposed sanctuary knocker for the use of the fleeing criminal and the very singular and imposing belfry, detached some yards on the north side of the church, received attention. The latter was evidently designed for defence, having no apertures but loopholes in the stone base, and the door bearing numerous shot and bullet holes.

Less time than it deserved could be spared for Pembridge, and somewhat reluctantly the drive was continued through three miles of pretty pastoral country to Eardisland, through the midst of which charming village the Arrow runs under a picturesquely-disposed but not too ancient bridge. Close to the waterside the ancient school-house of timber has recently been modernised to form a village reading-room, but against its wall a very rare example of the ancient village whipping-post, with its manacles for locking down the wrists of the culprit, remains in good condition. With the 4.11 train to catch at Leominster no time could be spared for the church, though its interest and antiquity were manifest at a cursory glance; but passing down the waterside the Rev. J. Barker, a local antiquary of celebrity, was by great good fortune encountered in front of his own house, a delightful building of quaintly-grouped timber and plaster gables and high-pitched stone roofs, which proved on examination and elucidation by its owner to be a most interesting instance of a fourteenth-century hall; the fine oak-arched principals and ogee-shaped wind-braces of a very fine roof could be seen in several of the bedrooms which have been in later times constructed within it. Much regret was expressed that through indisposition the hon. secretary, Mr. Cossins, could not be present, this being a singularly perfect and clear illustration of a subject to which he has given much attention in Warwickshire.

GEOMETRY IN DESIGN.*

(Concluded from page 410.)

OF the endless applications of the conic sections in the details of the Greek porticoes, it will be possible only to touch upon a few. The flutes of the shafts, we may note before proceeding further, were constructed of various sections. Speaking generally, the Doric flute was described having given its depth, which might vary, and the distance between the arrises. On this chord an equilateral triangle was described, with the vertex of which as centre the central part of the sectional arc was drawn. This would not evidently, in general, pass through the extremities of the given line joining the arrises, and therefore the sides were completed by arcs drawn from two other centres, and of smaller radius. The part of the arc, however, drawn from the first centre was determined by the directions of lines drawn from the vertex of the equilateral triangle to the points in which each half of the distance between the arrises is bisected.

The Ionic flute has been said to be exactly a semi-ellipse, but curves which answer closely to the original have been described as false ellipses from these centres. The curve of the flute of the Erechtheum has been described as a false ellipse stuck from five centres. But it would probably be difficult to distinguish practically between these interesting

* A paper read by Mr. H. A. Saunders, M.A., at the meeting of the Society of Architects, Mr. A. E. Stoner, member of council, presiding.

approximations and the true ellipse, of which the major axis is the distance between the arrises, and the minor axis the depth of the flute. It is worth noticing that the section of the flute changes as we proceed from the base towards the capital, becoming deeper and sharper at the edges as we rise higher. This variation, in Penrose's opinion, produces an excellent effect in deepening the shadows as we ascend, and leading the eye to the more complicated light and shade effects of the capital and entablature.

The proportions of the various parts of the column, though determined by more stringent rules than in Egypt, were yet somewhat elastic. In the Doric order the width of the abacus was always one-fifth of the height of the whole column, and in the Ionic one-eighth. These proportions were departed from only in a very slight degree; for example, the corresponding fractions in the case of the inner columns of the Parthenon was three-sixteenths, and in the case of Ionic columns of the vestibule of the Propylæa four thirty-thirds. The dimensions of the parts, however, seem to have been allowed to vary in different examples; only it must be remembered that the upper parts were made larger in proportion than the designer wished them to appear, to allow for the fact that they were seen at a somewhat greater distance. In fact, they were designed so that the visual angles, as determined from the point of sight from which the work was to be seen, might bear to one another the proportions which the designer conceived to be most desirable. When we remember that if a stick 10 feet in length were placed with one end at the height of the Parthenon capital above the upper step, the difference in apparent height according as it were turned vertically upwards or vertically downwards would, supposing it were viewed at a distance of 50 yards, be very nearly represented by an angle of 5 inches, or the angle subtended by a length of less than 3 inches placed at the same distance, we can form an appreciation of the delicate accuracy with which such work was designed.

In the case of the capitals and mouldings, conic sections are again found; but in these cases, as compared with the columns, the hyperbolic curves being of smaller eccentricity are recognised with much greater certainty. The parts also have been cast and sections of the castings traced. A simple graphic construction will then determine whether the curve assumed to be a conic section is a hyperbola, an ellipse or a parabola, and at the same time to fix the centre of the curve. It is then easy to determine on paper the direction and magnitude of the transverse or major axis, namely, by describing a circle concentric with the curve and bisecting the angles between the radii to the points of intersection. The curve then reconstructed from the elements so determined has been found to coincide very closely with the curve as traced from the cast, which is thus identified. In this way the ovolo of the Doric column, on the exactitude of which the beauty of the capital almost entirely depended, has been found to be a hyperbola of eccentricity represented nearly by the ratio 9 : 4, with which it will be useful to compare the ratios of 30 : 1 and 150 : 1 found for the curves of the entasis of columns of the Doric and Ionic orders respectively. The centre of this curve is very nearly marked by the vertical line determining the projection of the abacus.

The curves of the hypotrachelium in the same order present some little more difficulty, because in order to produce the greatest concavity immediately underneath the annulets, the axis of the hyperbola which defines the curve of the fillet between the flutes is inclined to the vertical. The edges of the annulets follow the same curve, whose centre is within the column, the concavity being, of course, outwards. The direction of its axis and the position of its vertex being found, as before explained, the perpendicular distance of the lowest point of the hypotrachelium curve from the axis can be measured, and this is found to bear a simple relation to the major axis, which relation varies, however, slightly in passing from one example to another. The curve of the section of the hypotrachelium through the bed of the flute is again a hyperbola of smaller eccentricity with its axis still more inclined to the vertical. Of the three hyperbolic curves in the Parthenon capital, the outer hypotrachelium curve has the greatest eccentricity, the ratio being between two and nearly three to one. The curve of the bed of the flute comes next with a ratio of about 4 : 3. The curve of the echinus gives approximately a ratio of 3 : 2. If we were fortunate enough to have had handed down to us the works of Greek designers, which we know to have existed, we might have been able to judge more accurately of the bearing of these dimensions of the curves on the light and shadow effects of this simple yet most elegant design.

The Ionic capital, scarcely so elegant it may be thought as the Doric, is said to be of Assyrian origin and to have had its prototype in the twisted horn of the goat or antelope. Its construction must have involved very considerable geometrical detail. The volute is its most prominent feature, but the other portions supply instances of the application of the parabola, ellipse and hyperbola.

According to Vitruvius the Ionic volute was described by

means of arcs of circles. Working on this hypothesis, Mr. John Robinson has produced a construction for describing its spiral, of which an indication may be given, and which, viewed as a geometrical construction, is of singular neatness and interest. He describes a series of rectangles within each other, following the law that any three consecutive sides must be in arithmetical progression. By bisecting the angles of these in succession he determines a series of smaller rectangles, the middle points of the sides of which give the centres of consecutive quadrants, if they may be so called, of the curve.

The remaining parts of this capital must be briefly referred to. The abacus is no longer square, as in the Doric, but shows a bevelled face, the section of which is a small hyperbolic arc with its vertex nearly at the upper edge. In the section at right angles to the return face of the volute we have a curve in some cases parabolic and in some cases hyperbolic, continued in the lower or as it were rolled up part by segments of circles or by an elliptic continuation. So that even without considering the nature of the curves of the ornaments, we find in some examples instances of the use of each class of conic section.

The soffit of the cornices in all cases seems to have been treated most carefully, possibly because in viewing the work from the ordinary point of sight, from beneath, the gradation of shadow upon them became a matter of importance. Whatever be the cause, in their sections, hyperbolas and parabolas are found with their vertices in some cases in the part of the curve employed, so that occurring, as the vertices do, just behind the face of the cornice, the moulding is at its outer edge for a short time nearly parallel to the outer face.

The Greek ornamental patterns were also designed by grouping together arcs of the same curves, and probably the contours of their vases, and the patterns inscribed on them will prove to have conformed to similar geometrical law. In the case of the Doric work the patterns, the egg and tongue, for example, and the "water pattern," were traced on the moulding and painted without sculptured relief. In the Ionic order they appear sculptured; but the patterns traced from the remains in Doric porticoes and placed on a plane surface give curves of all three classes of conics.

The Greek in his artistic aims adhered to the rule of æstheticism pure and simple; to use his own words he "followed the cult of beauty." The Roman, with much less attention to detail, built with a view to general stately effect. Thus he adopted the arch which the Greek had rejected, and thus too he generally ignored the delicate geometrical expedients in which, as we have seen, the Greek delighted. The temples, basilicas, arches and other remains of ancient Rome would only serve to illustrate in a less degree the geometric principles which attained their highest development in the best period of Athenian art.

Passing over then the monuments of Roman antiquity, we find in the early work of Christian times, except in so far as Christian work was influenced by Classical models, a simplicity which began to show efforts at more complicated effect in the Transitional Norman, Early English and Decorated periods—periods, it is to be noticed, strongly affected by the influence of the communications which the Crusades established between the East and the West.

That this did not result in an earlier return to Classical models was due to the loss of the scientific principles which had governed Classical work and to a Christian contempt of Pagan art, which certainly lasted down to the sixteenth century: witness the famous remark with which Pope Adrian VI. dismissed the art treasures of the Vatican—"Sunt idola antiquorum." But in their contact with the East, the Crusaders must have fallen under the influence of Eastern, and more particularly of Syrian Christianity, in which the Gnosticism that St. Paul encountered in Asia Minor still flourished. This hybrid Christianity drew alike from Kabalistic and from Neo-Platonic sources; and the home of Neo-Platonism, the abode of "the Jewish Plato," Philo-Judæus, was Egypt. Hence there can be little that Western Christianity became subject in a greater or less degree to a principle of symbolism, based to a great extent on mnemonic geometrical forms, and reverting in some measure to the symbolical forms of earlier Egypt.

It is possibly to this source that is due the use of the pentalpha or figure formed by joining the alternate angles of the regular pentagon, an example of which is to be seen in the south aisle of Westminster Abbey. This figure changed its significance from a symbol of health, representing the equally healthy development of the five senses of man, to a mnemonic indication of the five wounds of our Lord. The figure formed in a similar manner from the regular hexagon, and known as the hexagram, had its original symbolical significance, which is very probably of Egyptian origin, in the idea of the subordination of the lower nature of man, unstable, and represented by the equilateral triangle with its vertex downwards, to the higher or stable nature represented by the triangle placed on its base. The same principle of symbology is reproduced in the

"Beauséant," and in the "Vexillum Belli," the flags of the Templars, in which the lower part was coloured black and the upper white in indication of the victory of the powers of the upper world, as represented by the Christians, over the powers of darkness, personified by the Saracens.

The geometrical figures of this class are generally from their nature of stereotyped form, and therefore can have little reference to artistic work considered merely from its æsthetic side; yet their symbolism is of wide and varied historical and artistic interest, and it must suffice to refer to one or two such forms.

In Egyptian art we constantly find the hieroglyph known as the "crux ansata," or Nile key, consisting of a lenticular form attached to the tip of the "Tau cross," and forming what is conventionally known as the "handle" of the key.

The "Tau cross," introduced from Byzantine sources, but a pre-Christian symbol, is found in the capitals of Norman work, as in the Chapel of St. John in the Tower and elsewhere. The lenticular part of the symbol also occurs very widely in Christian art in the form of the *Vesica Piscis*, a form, be it observed, almost invariably used to indicate the divinity of the person enclosed therein, and hence employed to surround the central figure in later representations of the Crucifixion.

Now the central principle of the system of philosophy known as the Kabbalah was—to put it as briefly as possible—that the universe was not the creation of the Deity directly, but that He sent forth ten Sepheroth, or emanations of His own essence, to whom was entrusted the foundation and support of the worlds. These emanations were indicated on mystical diagrams—in some of which, by the way, the hexagram occurs—in some of which the Deity, still encompassing and controlling these emanations of His own Being, is indicated by a *Vesica Piscis* surrounding the whole. One of these diagrams was adopted by the Grand Master of the Templars as his seal, and presented the form of a triple cross surrounded by the *Vesica Piscis*.

This seems to point to the Templars more particularly among the Crusaders as a medium for the introduction of Eastern symbology; a conclusion which is strengthened by the consideration that at the time of the dissolution of the order in the thirteenth century, and when the Geometrical Gothic was beginning to merge into the Flowing style, the charges of idolatry made against the order were based on the discovery in their Commanderies of gems engraved with symbols, which the members of the order were said to worship idolatrously. These symbols were without doubt merely esoteric representations of Oriental philosophy, partly Christian or rather Gnostic, partly Kabbalistic, and perhaps derived originally from Egyptian occultism.

Whatever may be the ultimate determination of such points, if they can be determined, it seems very probable that much Christian mnemonic art has its origin in pre-Christian times. It is only natural that if such symbols are due to adaptation they should have been modified in the process. The variations of the *Vesica Piscis* for example are very numerous. We have seen illustrations of the use of both parts of the Nile key. If the symbol exists as a whole in Christian art, it will be found probably in a disguised form. It is, perhaps, worth while bearing in mind the connection between the Templars and the mystic systems of the East to consider the question whether the complete form of the Nile key is not embodied, though perhaps in disguise, in the combinations of rectangular and circular forms which exist in these our few remaining relics of the Order of Templars.

In conclusion, acknowledgment is gratefully made of the kindness of this Society in providing views for the illustration of this lecture, and of indebtedness to the works of Pennethorne and Robinson, Penrose, Prisse d'Avennes, Hulme and other authorities, and to papers by Mr. D. Fearon Ranking for the preparation of its substance.

MODERN AMERICAN COUNTRY HOUSES.*

LET us take up the designing of a country house as an architect takes it up in each individual instance. First, as to arrangement; and, before we can do very much definitely with that, we must have some notion of the general appearance of the house as we wish it to be; whether a blocky mass, after the fashion of the quasi-classical house of a century ago, such as the old house until recently existing in the upper part of New York City, or whether a thing of points and gables tossed together skilfully and artistically, such as the more modern house at Short Hills, of neither of which examples do I know the name of the designer; whether low and rambling, or piling up pyramidally. No matter which the surroundings and circumstances may lead us to select, we can make a good thing of it as a design outwardly if we are clever enough.

Having made sure of what we want as to general effect, and, if we know what we are about, having been influenced in the choice by no considerations of fashion or imitation, but solely by the consideration of what will best suit our location, we try what sort of an interior we can devise that will work with such an exterior as we are aiming at.

We would like, perhaps, a square entrance hall, with no vestibule, a large dining-room, and a larger drawing-room, as it is now the fashion to call it, reviving the name by which it was known to me in boyhood. Besides, we want a library, to be used also as a smoking-room, a sitting-room, or morning-room as it is called in England, although the functions are not quite the same, as the English morning-room is used for breakfast and luncheon, as well as for general use between meals. There will be bedrooms wanted, of course, as many as we can get, probably more than can be placed above the lower rooms in one storey.

With all there will be a strict money limitation, so that it will be no wonder if we have to weigh each requirement, relinquishing some, modifying others, insisting upon a few in order to make the outside, the inside, and the appropriation harmoniously fit together.

In arranging our rooms some of the English customs may be studied to advantage. In American homes the desire for wide sliding doors between the principal rooms is very general. The effect, when these doors are open, is spacious and pleasant, and the practical utility when the whole house is open for entertaining is evident. In England such wide doorways are unusual; each room is separate, giving a new scene and new interest as we pass from room to room.

In our larger country houses there is a tendency to approach the English model in many respects, like causes as usual producing like effects. Such a tendency is shown in the plan of a country house in West Virginia by C. T. Mott. The great hall is about sixty feet long and the dining-room about forty. The development of a class of people of independent means and not depending on their labour for their living is producing very much such a house as the same class, long existing in England, has found best suited to its tastes there. The most marked feature is the double entrance—the carriage-porch and the garden entrance, the one for the mere business of entering, the other the approach to the pleasure grounds, park, garden, or often merely what we would call a yard.

How spontaneously similar circumstances generate similar solutions is illustrated in the plan of a country house to be used as a shooting-box, designed by the writer. There was no especial attempt to imitate English methods. Given a large forest tract, where wild game abounded, a taste on the part of the owner for the chase, a house to be used chiefly for the gratification of this taste, the plan naturally follows. One storey high, because there is no need of condensing into two or three. No cellar to speak of, because the coolness of the summer requires none for keeping things cool, and, the occupation being only in summer, no cellar is needed for heating apparatus, or as a frost-proof place of deposit. Immediately we have what is essentially the English country house. A large hall, paved upon the surface of the soil, properly prepared, in this case paved with brick; long rambling corridors, running off in one direction to bedrooms, in another to kitchens and the other offices, a dining-room, and a quite subordinate drawing-room, a boudoir for the ladies' use, a cosier refuge than the great hall. Finally come the stables and kennels enclosing the gravelled quadrangle.

The Hempstead house, by the writer, gives the double entrance again, the garden front—always the principal part—upon the lawn, the real entrance with covered carriage-porch in the rear.

Some English arrangements will not bear copying—their manner of separating the dining-room from the serving-room and kitchen, for instance. In a way that is manifestly studied, but for what real reason the American mind finds it hard to guess, their dining-rooms are placed so that all the dishes must be carried across the main hall, through the only door which is provided for entrance. Inquiry has disclosed that a dining-room with more than one doorway is looked upon as "a terrible place for draughts," and in a country where unwarmed halls and bare neck and arms for dinner are the custom such considerations are necessarily paramount.

When we come to actually carrying out whatever plan we finally work out, the expediencies to be weighed and questions to be settled are innumerable. For most of them no perfect solution can be found; it is at the best accepting the inevitably imperfect. In every case, too, we must aim at the reasonably practicable financially; the very best way is often too costly to be prudent, even if there is money at hand to pay for it.

For the material of the outside stone is rarely available. Rough field stone when found on the spot may do well enough, but even then it is far more costly than the framed construction. The latter is the usual resort, covered with shingles, or rough cast or clap-boards, if we can condescend to such banality. There is nothing more generally available than

* From a paper by Mr. John Beverley Robinsen, published in the *Engineering Magazine*.

shingles; cypress last longest and greys well with the weather. Although white pine gives a whiter and more silvery grey, it is not so enduring. Cedar shingles turn blackish rather than grey, and are better stained.

Cement, plain or covered with pebbles, does well for parts or for the whole, and suggests masonry in a very satisfactory way. I have a notion that slate could be used more than it is for covering the sides of houses, as well as the roofs. The trouble is the objectionable colour of the ordinary black slate—the excessive uniformity of the market slate of all kinds. There is beautiful slate to be obtained which is regarded as waste by the quarries, very much as until recently the most beautiful brick were rejected by the kilns because they did not meet the demand for uniformity of colour. These inferior qualities, as they are considered, I have reason to believe are of as good quality as many others for wear. After a year or two they change colour irregularly, fade into soft blue greens, olives or browns, which make with the original green or purple a colour effect which it is a joy to behold.

They have a way in the West of veneering houses with brick, which is a perfectly legitimate and available resource. There they use it to imitate a brick construction, but such a fatal attempt at imitation is easily avoided. Properly used, a veneered brick house will have a character of its own, and can be made no less satisfactory than shingles.

There is one point trifling to the unprofessional mind, but very important to the professional. I speak of what are called flashings. These are the metal-sheets used for making tight joints in the angles of roofs, about chimneys and in other places. Tin, however well painted, is sure eventually to rust into holes. Zinc is rustless and cheap, but apt to crack in putting on. Lead is good for many reasons, but best of all is copper. Use copper, if your purse can stand it, by all means, for flashings, gutter-linings and all similar purposes. If not copper, lead and zinc judiciously used are always available—zinc in small pieces, where much bending will not be needed; lead over doors and windows and built into chimneys for what are known as “cap-flashings.” These make tight and permanent work.

In the interior the chief part of the work is plastering; the chief part, that is, in superficial measurement, as five sides out of six in each room are usually plastered. Of late years what are called hard plasters have been introduced. These are said to be substantially of the same nature as the well-known Keene's cement—that is, of plaster of Paris mixed with alum and reburned. Asbestos fibre is mixed in to take the place of the usual hair. There are various makes of hard plaster, all of which are said to be good; the only one of which I can speak from experience is the “Windsor cement.” Of this, one virtue I can distinctly affirm; and doubtless there are others which have the same advantage. It does not fall from the ceiling, no matter how much it may have been saturated. In other ways the hardness is of advantage, especially against the bruises and marrings caused by accidental knocks from furniture or otherwise. Hard plaster, however, has two drawbacks; the first is that workmen are apt to put it on as ordinary plaster is put on, which is sure to make it worthless; the other is that the harder and better it is the more it transmits sound through partitions and floors. With floors this is easily remedied by a layer of soft felt paper; in partitions no convenient and inexpensive remedy presents itself.

Floors come next to plastering, and are much more difficult to make satisfactory. Double floors, of course, we must have, the under floor as rough as you like, only the boards must be of even thickness, and it is better to lay them diagonally than across the beams. Laid across, each wide board is sure, when it shrinks, to gather three or four of the narrower boards of the top floor together, making a wider crack than usual at that point. When they are laid diagonally this difficulty is avoided. On this rough floor we will lay a thickness of deafening paper—asbestos, if we can afford it. The real trouble comes with the top floor. No matter how much care is used in drying the material, cracks are almost sure to appear after a winter or two of furnace heat. The narrower the boards are, the narrower of course the cracks will be, and the more expensive the floor. In fact, if we must have the best floor possible, I should use the parquet floor put down by experienced men who do nothing else. The cost would not be prohibitory, even for an ordinary fortune, not so very much in excess of a hard-wood floor in very narrow strips. It is possible that something in the way of a continuous paper floor may be seen in the future; the inherent defects of a wood mosaic are insuperable. Such a paper floor I fancy I could construct, but such new devices are not commercially available until somebody devotes himself to manufacturing them.

One word about windows. The usual guillotine sash, though the most convenient, is the ugliest thing possible. You may take your choice, beauty and draughts, or ugliness and what the yachtsmen call “weatherly qualities.” On the other hand, nothing can be prettier than the casement sash, opening outward. They are out of the way, too, of curtains and furni-

ture; but, besides the other defects which almost all casements have—of not being tight, and of slamming and breaking the glass—they have a curious and unforeseen drawback, it is impossible to wash them on the outside without a ladder, or taking them off their hinges and lifting them bodily indoors. A pretty arrangement which avoids this inconvenience is sometimes available. The window is divided into four parts in width; the middle pair of sashes open outwards, the two sashes at the sides open inwards, but are only intended to be opened for the purpose of washing the middle pair.

All the rest of the construction of the house—doors, stairs, closets, pantry arrangements, dumb-waiter, and such trifles, no doubt they seem as door-knobs and sash-fastenings—I pass over; but to each the architect must give some consideration.

After the main part of the actual construction has been determined the no less important matter of appliances is to be thought out. By appliances I mean gas-fitting, plumbing, drainage and heating. Sanitary plumbing has been pretty well exhausted as a topic, written and rewritten to revulsion. With drainage the case is much the same.

Pages might be filled with such considerations, upon the fifty or a hundred items that go to make up a house; but which I chiefly wish to convey is that each way of doing each thing has its advantages and its corresponding disadvantages. The work of the architect is to balance these as best suited to the matter in hand, so as to secure a practically, æsthetically, and economically harmonious result.

LONDON COUNTY COUNCIL BUILDINGS.

AT the meeting of the London County Council on Tuesday a report was submitted by the Establishment Committee on the schemes for a county hall, which were initiated in 1889 in consequence of the growing wants of the Council for increased space. In 1889 the staff in the central offices numbered some 200; it had now risen to 350, of whom 100 were located in different houses away from the county hall. The committee gave extracts from the reports prepared by the Offices Committee in 1890 and in 1892 dealing with various suggested sites. These sites were:—1. Christ's Hospital site, which the Offices Committee did not consider suitable on the ground that the frontage to Giltspur Street and Newgate Street was so small, and that a large portion of the ground was “back land,” over which there were several rights of light. The cost of acquiring the total area would probably exceed 500,000*l.*, which the committee thought was a figure which precluded further consideration being given. 2. Victoria Embankment site (City), which the Offices Committee stated in July 1890 consisted of an area of 2½ acres, or 99,500 feet. Subsequently, however, a large portion of the site in the rear was disposed of, leaving only 53,043 square feet available, of which 7,301 square feet was over the District Railway; they therefore deemed the site unsuitable. 3. Site at Holborn, including Barnard's Inn, of over an acre in extent, an area, in the opinion of the committee, too small for the purposes of the Council. 4. Site near the British Museum, comprising nearly three acres, abutting on New Oxford Street and Tottenham Court Road. On asking for further particulars the committee ascertained that the land under ordinary circumstances would not be offered for sale, nor that any valuation of the freehold had been made. The committee came to the conclusion that the site would not be a suitable one. 5. Millbank Prison site, regarding which the Offices Committee stated that it was suggested by Mr. S. S. Tayler, who estimated the cost of it at 120,000*l.* After considering the matter, the committee were of opinion that the site was not sufficiently central, and that the price suggested was not in conformity with the views of the Home Secretary. 6. Foundling Hospital site, which the committee considered extended beyond the order of their reference. 7. Warehouse property in Fenchurch Street, the only particulars of which were given were that the property comprised an area of 107,000 square feet, and that the price was 7*l.* per square foot, equal to 749,000*l.* The price appearing exorbitant, the committee did not think it expedient to obtain further particulars. 8. Farringdon Market site, regarding which the Offices Committee considered that the area was somewhat limited for the future requirements of the Council, and was further restricted by ancient lights. The site was afterwards sold. The Establishment Committee then proceeded to deal with the sites considered by themselves. With regard to the Salisbury estate property, the committee reported that an offer had been received from the Official Receiver in March last to sell it to the Council at the price of 400,000*l.* With regard to the building, they were of opinion that it could not be adapted so as to make satisfactory municipal offices. The committee had also considered the suitability of a site on the Victoria Embankment, between Horse Guards Avenue and New Scotland Yard, but on investigating the matter they found it was hardly

adequate in size, and, further, that they could not obtain the principal portion. Since their previous report communications had been received from the clerk to the governors of Christ's Hospital, inquiring whether there was any probability of the Council treating for the whole or a portion of the hospital property, and intimating that the total area now available would be about $3\frac{1}{2}$ acres, and from the chairman of the Royal Aquarium Society with reference to the property of the Society. They had considered these communications, but they did not think it desirable to make any alteration in their recommendation, which was that the offer to sell to the Council, for the sum of 750,000*l.*, the Parliament Street site be accepted. To this recommendation notice has been given of amendments by Mr. Arnold, Mr. Boulnois, M.P., and Mr. Fardell.

The attention of the London County Council has been again directed by the Official Receiver (Mr. C. J. Stewart), who has charge of the affairs of J. W. Hobbs & Co., now in course of liquidation, to the suitability of the Salisbury estate property for the purposes of the Council. The property, which has an area of $2\frac{1}{4}$ acres, consists of the main building, having a frontage to the Embankment of about 216 feet, and a depth of about 94 feet; a block of buildings on the west side, adjoining Adam Street, Adelphi, now in course of erection; and twelve houses on the east side, at present producing a rental of 865*l.* As planned, the principal entrance to the main buildings was to be from the Strand; but it is pointed out that if the Council decided on the acquisition of the property another entrance could easily be made on the southern side, with a drive up through the gardens on the Embankment. The main part of the building contains a hall—originally meant as a dining-room—which could be adapted for the Council's chamber, with seating accommodation for 158 councillors, and two galleries, one for the Press and the other for the public, the latter seating 168. The measurements of this hall are about 74 feet by 54 feet, and the height is 28 feet. If, however, this hall were not considered suitable for the purpose of the council chamber, it is suggested that the piece of ground on the eastern side of the property, about three-quarters of an acre in extent, on which are the twelve houses above referred to, could be made available as a site for the erection of a much larger chamber. Besides this hall the building contains nearly 300 rooms; some of them are large, but the greater number of them are small; the latter, however, it is said, could be enlarged at little cost by taking out partition walls. Under the courtyard, which lies between this building and the Strand, are a number of vaults with an underground roadway, which are estimated to produce a rental of 4,500*l.* a year. The whole property (site and buildings) when it came into the Official Receiver's hands was mortgaged to the extent of 692,000*l.* (the third mortgage, that to the Liberator Society, being for 452,000*l.*), and is now offered by him to the Council at 400,000*l.* The cost price of the land alone was 200,000*l.*, which works out at 2*l.* 14*s.* a square foot; and the price of the property in its present state, with the buildings partly erected on it, works out at 5*l.* 8*s.* a square foot. In this connection it will be remembered that the price of the Parliament Street site, recommended by the Establishment Committee to the Council, worked out at 7*l.* 13*s.* a square foot. The Official Receiver further states that he has had an estimate made of the cost of finishing the main building and making it ready for use, and that such cost would not exceed 60,000*l.*

NEWBATTLE ABBEY.

THE members of the Dalkeith Rambling Club lately paid a visit to Newbattle Abbey, the Mid-Lothian seat of Lord Lothian. Mr. Ramsay, clerk of works, was in charge of the party. After seeing the famous beech tree, the largest in Scotland, the company walked to the Abbey house, at which various interesting matters were stated. The Cistercian monastery of Newbattle was founded in the twelfth century by David, and by then almost universal custom the site, in a valley at the side of a running stream, was chosen with various practical considerations of great importance. Excavations made in 1878 and more recently laid bare the foundations of the church and the walls of a conventual residence. The north transept has two angle buttresses of large dimensions, the north wall being 7 feet 6 inches in thickness and 46 feet wide inside between the east and west walls, including the side chapels. From the inside of the north wall to the north aisle is 30 feet 9 inches, and the length of the main building from the great western door to the east end of the chancel is 293 feet, whilst the width across the nave and aisles is 57 feet. The width from north to south transept, including the crossing, is 122 feet. The only other abbey in Britain having great angle buttresses is that of Furness, in Lancashire, but these are on the corners of the chancel at the east end. Furness Abbey was founded nearly twenty years after Newbattle. The Abbey of Newbattle was twice destroyed by fire, in 1398 and in 1544.



Otis Electric Elevators.

SIR,—We are having so many inquiries as to whether or not we have an exhibit in the exhibition at Chicago, and those inquiries have indicated so much of interest in the subject, that perhaps we may be allowed to state through your columns that this company has no exhibit, its business being entirely confined to the countries on this side of the Atlantic. Our American friends, however, Otis Brothers & Co., of New York, and Hale Elevator Company, Chicago (all of whose patents for Europe we own), have a large exhibit of all the different types of hoisting machinery, including two electric elevators of different types. They have entered as an exhibit the eight passenger elevators which run from the main floor to the top of the tower in the transportation building, and they have the only elevator plant in operation in the great building of manufactures and liberal arts. These are electric. In both the transportation and liberal arts buildings the elevators land passengers at platforms communicating with walks extending around the upper portion of the roof on the outside. This walk, in the case of the latter building, is fully half a mile long, about 220 feet above the ground, and commands the finest view of the fair grounds that can be obtained.

As the owners of all the European patents of Otis Brothers & Co., and as our productions are identical with those referred to in the United States, the name of this company appears on all these exhibits.—Yours faithfully,

WM. AUG. GIBSON, Managing Director.

Otis Elevator Company, Limited: June 22.

GENERAL.

Mr. J. Hunter-Duvar contributes to the *Reliquary* for July an article on "The Dawn of Art," illustrated. Articles are also given in the same issue on "The Misericords in Limerick Cathedral," by D. Alleyne Walter; "The Pre-Conquest Churches of Northumbria," by Charles Clement Hodges; and "Some Sculptured Stones at Boroughbridge," by Alex. D. H. Leadman.

The Clifton Antiquarian Club, under the guidance of the secretary, Mr. A. E. Hudd, have made an excursion to Bath and inspected the abbey and the Roman baths, which they were shown by Major Davis, F.S.A., the city architect. They then went on to Wellow and examined the tumulus at Stony Littleton, under the direction of the Rev. H. H. Winwood, and afterwards inspected Wellow Church.

Mr. John Henry, architect and surveyor, Durham, has passed away in his seventy-ninth year, after a painful illness of some months' duration. His practice was mainly in that city, and for fifty years he held the appointment of clerk of works to the university. Mr. Henry has left a widow, one daughter and three sons.

Mr. Lewis Barrett has prepared plans for the drainage of Portslade and Southwick, in Sussex, which have been adopted by the Steyning Sanitary Authority. The work will cost 13,000*l.*

Wilhelm Scholz, who was during several years one of the most humorous draughtsmen on the "Kladderadatsch," has died in Berlin.

A Statue of Jules Grévy, the work of M. Falguière, has been set up in the Place Pinzon (now Place Grévy) in the town of Dôle. The President is represented standing, and at his feet is a figure of France offering him the tricolour. The cost of the memorial was mainly borne by the Grévy family.

Mr. George Wood has resigned the office of head-master of the Sidney Cooper School of Art, Canterbury, which he has held for six years.

At the General Assembly of the Royal Society of British Artists the following gentlemen were elected members, viz.:—Messrs. Gilbert Foster, H. G. Hewitt, N. A. Loraine, Wm. Manners, Arthur Ryle, G. Hillyard Swinstead, W. E. Tindall, Leonard Watts and Walter West.

The Annual General Meeting of the Dundee Institute of Architecture, Science and Art was held yesterday (Thursday), when the annual report was presented.

The Chapel Royal, Stirling Castle, is being cleared out, and excavations conducted beneath where the altar stood. It is supposed that the Regent Lennox, who was killed in Stirling in 1571, was buried there.

Professor Copeland reports that considerable progress has been made in the erection of the new buildings for the Royal Observatory, Edinburgh.

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BANSTEAD.—Jan. 6.—For Building Porter's Lodge and Alterations to Workshops at Schools. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

BARKING.—Jan. 24.—For Building Public Offices and Public Library, Fire Station, Mortuary, Stabling, Cart Shedding, and Cottage. Mr. C. J. Dawson, Architect, East Street, Barking.

BEDMINSTER.—Jan. 6.—For Enlargement and Alteration of Knowle Infant School. Mr. Maynard Froud, Architect, 3 St. Stephen's Chambers, Baldwin Street, Bristol.

BELFAST.—Jan. 9.—For Rebuilding Premises, Amelia Street. Messrs. Young & MacKenzie, Architects, Donegall Square East, Belfast.

BELFAST.—Jan. 24.—For Building Goods Store, 300 feet by 120 feet, at Terminus. Mr. John Milliken, Secretary, Belfast.

BOGNOR.—Jan. 13.—For Pulling Down and Rebuilding Bridges. Mr. Charles Adcock, County Surveyor, 5 Queen's Square, Bognor.

BRIERLEY HILL.—Jan. 18.—For Building Crown Post Office. Mr. H. W. Primrose, Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

BRIGHTON.—Jan. 12.—For Building Public Abattoir, Supply and Erection of Machinery and Fittings, and other Works in Connection. Mr. Francis G. C. May, Engineer, Town Hall, Brighton.

BURNLEY.—Jan. 18.—For Painting and Decorating Interior of Town Hall. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

BURNLEY.—For Alterations to Shop. Mr. Thomas Bell, Architect, Burnley.

CALCUTTA.—Jan. 6.—For Supply of 24-inch and 48-inch Double-faced Sluice Valves, with Gun-metal Spindles, Nuts and Faces, &c., Cast-iron Pipes, Irregular Castings, Strainers, Floats, &c., for the Waterworks. Messrs. J. Quick & Son, Engineers, 36 Great George Street, Westminster.

CARLBY.—For Restoring Nave, Roof of Parish Church. Messrs. Charles Kirk & Sons, Architects, Sleaford.

CARLTON.—Jan. 17.—For Constructing Culvert and Concrete Work for the Local Board. Mr. J. K. Clark, Clerk, Board Room, Carlton.

CASTLETON.—For Building Leather Works. Messrs. Butterworth & Duncan, Architects, 4 South Parade, Rochdale.

CATERHAM.—Jan. 13.—For additions to Water Storage and other Work at the Asylum for Imbeciles. The Metropolitan Asylum Board, Norfolk House, Norfolk Street, Strand, W.C.

COLCHESTER.—Jan. 6.—For the Supply, &c., of Two Sets of Three-cylinder Compound Vertical Pumping Engines, with a Set of Pumps to each, Two Multitubular Steel Boilers, Traveller, Tools, &c., Cast-iron Pumping, Supply and Service Mains, Connections to existing Mains, and Cast-iron Service Tank, Sluice Valves, By-passes, Girders, &c. Mr. Charles E. Bland, Superintendent of the Waterworks, 12 Crouch Street, Colchester.

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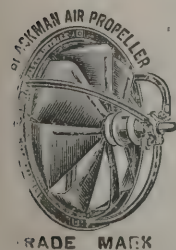
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TRADE MARK

CORNWALL.—Jan. 25.—For Restoring St. Keverne Church. Mr. Edmund Sedding, Architect, 7 Buckland Terrace, Plymouth.

DARTFORD.—Jan. 6.—For Additions to Coach-house and Stable, Long Reach. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

FRECKLETON.—Jan. 14.—For Building Four Semi-detached Cottages at Grange Farm. The Borough Engineer, 16 Church Street, Preston.

FROME.—Jan. 11.—For Construction of Covering Over Up-platform. The Engineer, Paddington Station.

GLASGOW.—Jan. 14.—For Construction of Additional Aqueduct from Loch Katrine (3 miles). Mr. Gale, Engineer to the Water Commissioners, 45 John Street, Glasgow.

GOLDEN LANE.—Jan. 13.—For Works of Repair, Painting, Cleaning, &c., at Warehouse, known as Manchester Buildings, for the Vestry of St. Luke. The Surveyor to the Vestry, Vestry Hall, City Road, E.C.

GRAVESEND.—Jan. 16.—For Building Board School. Mr. Geo. C. Hammond, 23 Harmer Street, Gravesend.

HASTINGS.—Jan. 11.—For Supply of Cast-iron Water Mains. Messrs. Jeffery & Skillier, Surveyors, 5 Havelock Road, Hastings.

HIPPERHOLME.—Jan. 14.—For Alterations and Additions to the Hare and Hounds Inn. Mr. Raymond Berry, Architect, Arcade Chambers, Halifax.

HORBURY.—Jan. 7.—For Building Two Cottages. Messrs. Hart & Dawson, Architects, Wakefield and Horbury.

HORNSEY.—Jan. 6.—For Constructing Stoneware Pipe Sewer. Mr. T. de Courcey Meade, Local Board Offices, Southwood Lane, Highgate, N.

HORNSEY.—Jan. 9.—For Sewering, Paving and Making Roads. Mr. T. de Courcey Meade, Local Board Offices, Southwood Lane, Highgate, N.

ISLEWORTH.—Jan. 10.—For Two Gas-engines, 12 horsepower (nominal), with necessary Appliances (to use Dowson's Gas), to replace smaller ones at Sewage Works, Wyke Green. Mr. A. Lawrence Houlder, Local Board Offices, High Street, Southall, Middlesex.

KENDAL.—Jan. 10.—For Building Superintendent's Residence, Police Offices, Cells, &c. Mr. Stephen Shaw, Architect, Kendal.

LEEDS.—Jan. 14.—For Extension and Completion of Menston Asylum. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

LONDON.—Jan. 11.—Brick and Pipe Sewer (565 feet and 850 feet), Rahere Street. The Surveyor, St. Luke, Middlesex, Vestry Hall, City Road, E.C.

LONGFORD.—Jan. 21.—For Building Post Office and Residence. Mr. J. H. Roynan, Architect, Nenagh.

MIDLAND RAILWAY.—Jan. 6.—For Building Cottages at Oakley and Warehouse at Thorney. The Company's Architect, Cavendish House, Derby.

MINORIES.—Jan. 11.—For Construction of Goods Depot, Warehouse, Offices, &c., at America Square. The Engineer, Paddington Station.

NEWTON-UPON-OUSE.—Jan. 13.—For Restoration of Bridge over the River Kyle. Mr. Octavius Robinson, Clerk to the Highway Board, Easingwold.

OSAKA.—For Supplying Three Sets of Centrifugal Pumps, Five Sets of Double-acting Main Pumps, Boilers and other Accessories, as required in the Osaka Waterworks, Japan. N. Okoshi, Acting Consul-General for Japan, 84 Bishopsgate Street Within, London, E.C.

OSSETT.—Jan. 12.—For Building Five Houses, Outbuildings and Boundary Walls. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

OXFORD.—Feb. 7.—For Erection of Municipal Buildings. Mr. Henry T. Hare, Architect, 1 York Buildings, Adelphi, W.C.

PENMAENMAWR.—Jan. 6.—For Re-erection, &c., of House and Shop. Mr. Richard Davies, Architect, Bangor.

PLYMOUTH.—Jan. 11.—For Construction of Waiting Room at Mutley Station. The Engineer, Plymouth Station.

PONTYPRIDD.—Jan. 14.—For Construction of Filter Beds, Service Tank, &c. Mr. Togarmar Rees, Engineer, Corn Exchange Chambers, Newport, Mon.

POOLE.—Jan. 10.—For Building Offices, &c., for Mr. J. J. Norton. Messrs. Lawson & Donkin, Architects, Yelverton Chambers, Bournemouth.

PORT GLASGOW.—Jan. 7.—For Building Public Baths and Washhouses. Mr. J. B. Stewart, Architect, 2 Hamilton Street, Greenock.

RHAYADER.—Jan. 9.—For Alterations and Additions to Lion Hotel. Mr. Stephen W. Williams, Architect, Rhayader.

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RIPON.—Jan. 7.—For Building Mechanics' Institute and Technical School. Mr. George Styan, Architect, St. Helen's Chambers, Davygate, York.

ROTHERHAM.—Jan. 7.—For Building Three Dwelling-houses and Sale Shop. Mr. J. Platts, Architect, Rawmarsh Hill, Rotherham.

ROTHERHAM.—Jan. 9.—For Building Board Schools, Ferham Street, Masbrough. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

ROTHERHAM.—Jan. 14.—For Alterations to Shops in College Street. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

SENNEN.—Jan. 7.—For Building Pair of Cottages, Penrose Farm. Mr. G. Gow, Tregothnan Office, Truro.

SMETHWICK.—Jan. 13.—For Construction of Brick and Pipe Sewers, &c. Messrs. Harris & Harris, Engineers, 9 Benett's Hill, Birmingham.

STAINLAND.—Jan. 18.—For Building Warehouse and Offices at Dog Lane Mills. Messrs. C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.

STANLEY.—Jan. 7.—For Building Police Station. Mr. Wm. Crozier, County Architect, Shire Hall, Durham.

ST. AGNES, REDRUTH.—Jan. 24.—For Building Coastguard Station. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

STAMFORDHAM.—Jan. 7.—For Building Police Station. Mr. John Cresswell, County Architect, Moot Hall, Newcastle-on-Tyne.

ST. GEORGE.—Jan. 23.—For Building Higher Grade and Technical School. Mr. F. Bligh Bond, Architect, 36 Corn Street, Bristol.

STUDHAM.—Jan. 10.—For Restoration of Church. Mr. Sutherland, Ashridge Estate Office, Little Gaddesden.

SUNDERLAND.—Jan. 7.—For Additions, &c., to 40 & 41 Fawcett Street. Mr. W. Milburn, Architect, 35 West Sunnyside, Sunderland.

SUNDERLAND.—Jan. 9.—For Alterations to Corporation Buildings, East Cross Street. The Borough Surveyor, Town Hall, Fawcett Street, Sunderland.

WEST HARTLEPOOL.—Jan. 11.—For Construction of Retort House Roof and Roof for Coal Store. Mr. Thomas Bower, Engineer, Gas and Water Company, West Hartlepool.

WOMBWELL.—Jan. 13.—For Enlargement of Jump Board School. Mr. W. J. Sykes, Architect, Hoyland, near Barnsley.

WOOLWICH.—Jan. 10.—For Engineering Work in connection with Public Baths in course of Erection. Mr. H. H. Church, Architect, William Street, Woolwich.

TENDERS.

BRADFORD.

For Street Drainage Works, Kerbing, Channelling, &c., West Bowling, for Mr. E. B. W. Balme. Messrs. JOSEPH SMITH & MARGERISON, Surveyors, 14 Tanfield Chambers, Piece Hall Yard, Bradford. Quantities by the Surveyors.	
J. Duckett, Bradford	£609 0 0
T. Egan, Bradford	404 14 0
A. H. Hutchinson, Bradford	445 0 0
W. Totty, Bradford	437 5 0
M. Hall, Bradford	418 5 2
R. Naylor & Son, Cleckheaton	416 8 3
W. BARRAND, Bradford (accepted)	361 14 2
R. Parker, Bradford	328 13 0

BRISTOL.

For Building the Church of St. Bartholomew, Montpelier, Bristol. Messrs. W. & C. A. BASSETT-SMITH, Architects, 10 John Street, Adelphi, London.	
Davis, Bristol	£6,045 0 0
Eastabrook & Sons, Bristol	6,000 0 0
Perkins, Bristol	5,998 0 0
Cowlin & Sons, Bristol	5,780 0 0
Humphreys, Bristol	5,771 0 0
Hatherly, Bristol	5,681 0 0
Stephens & Bastow, Bristol	5,647 0 0
Church, Bristol	5,456 0 0
Brock & Son, Bristol	5,220 0 0
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R. Wilkins & Sons, Bristol	5,016 0 0
G. H. WILKINS, Bristol (accepted)	5,011 10 0

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For Noake's Memorial Pulpit, Bushey Heath Church, Hertfordshire. Mr. JAMES NEALE, F.S.A., F.R.I.B.A., Architect, 10 Bloomsbury Square.	
J. NORRIS & SONS, Sunningdale (accepted)	£139 0 0
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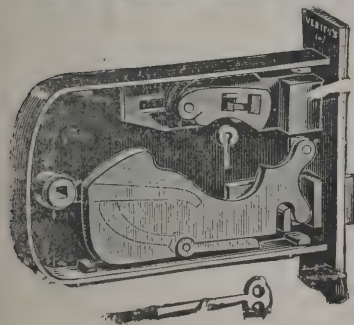
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C. O. Bullough & Co., Ulverston	1,930	0	0
C. O. Bullough & Co., Ulverston	1,876	5	0
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J. POMROY, Ashburton	410	13	0

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Accepted Tenders.

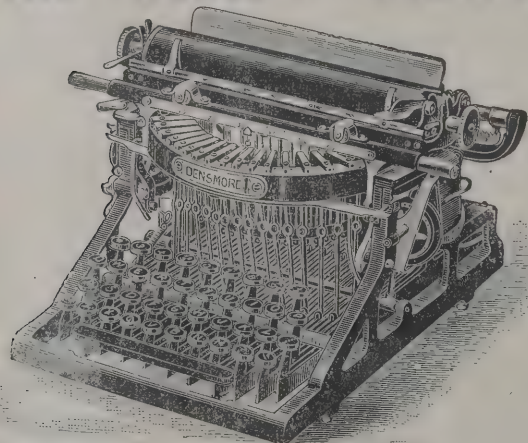
Wm. Sutcliffe, Sowerby Bridge, masonry, brickwork, &c.	£22,000	0	0
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Rushworth & Firth, Halifax, slater and plasterer	3,237	0	0
G. Greenwood & Sons, Halifax, concreting	1,834	7	0
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W. Hill & Co., Gosport	960	0	0
E. Margrett, Reading	950	0	0
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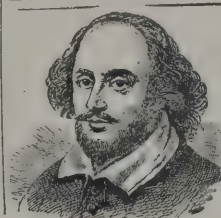
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For Building Board School, Simpson Avenue, Northampton.
 Sharman Bros. £9,180 0 0
 Hawtin 9,110 0 0
 Green Bros. 8,777 0 0
 Woodford & Son 8,661 0 0
 Martin 8,648 0 0
 J. T. WINGROVE (accepted) 8,439 0 0

NORTHAMPTONSHIRE.

For Alterations and Additions at Oxenden, under the Superintendence of Mr. JAMES NEALE, F.S.A., F.R.I.B.A., Architect, 10 Bloomsbury Square. Quantities not supplied.
 SMITH & Co., London (accepted) £3,586 4 0

Stable-fittings.

Barton, Oxford Street.

RHAYADER.

For Building Dwelling-house and Shop, East Street, Rhayader, for Miss Lloyd. Mr. STEPHEN W. WILLIAMS, F.R.I.B.A., Architect. Quantities by Architect.
 John D. Williams, Knighton £1,324 0 0
 H. Welsh, Hereford 1,219 0 0
 Richard Price, Shrewsbury 1,150 0 0
 W. P. Lewis & Co., Hereford 1,100 0 0
 THOMAS PRICE, Hay (accepted) 1,080 0 0

SEVENOAKS.

For Laying 9-inch Stoneware Pipe Sewer, with Manholes, Lampholes and Flushing-tank in Seal Hollow Road, and Making Good Part of the Road, &c., Sevenoaks. Mr. JABEZ MANN, Surveyor.
 W. Wiltshire, Sevenoaks £1,333 3 3
 S. Hudson, Streatham Hill 1,148 3 9
 E. ILES, Wimbledon (accepted) 1,133 9 1
 Surveyor's estimate 1,180 0 0

SOUTHAMPTON.

For Wood-paving at Drill Hall of the 1st Hants Artillery Volunteers, St. Mary's Road. Major W. B. G. BENNETT, Engineer, Southampton.
 J. Preedy, Southampton £399 17 3
 Dyer & Sons, Southampton 398 0 0
 J. W. Roe & Co., Southampton 360 0 0
 J. Treherne & Sons, Southampton 351 15 6
 J. W. Rowland & Sons, Southampton 349 0 0
 G. B. JORDAIN & Co., Southampton (accepted) 345 0 0
 Engineer's estimate 390 0 0

THAMES DITTON.

For Alterations, Ember Lodge, Thames Ditton. Mr. W. I. CHAMBERS, Architect.
 Ingram & Son, Hersham £798 0 0
 Saml. Woods, Weybridge 750 0 0
 Hilder & Edge, Golden Square 730 0 0
 J. W. ACOCK, Forest Gate (accepted) 725 0 0

TOTNES.

For Alterations and Additions at Dundridge House, for Mr. Robert Harvey, J.P. Mr. W. TOLLIT, Architect, Totnes. Quantities supplied.
 Laphorn & Goad £2,025 0 0
 Reeves & Selwood 1,733 0 0
 Chapman & Pearce 1,732 0 0
 Rundle & Brown 1,699 0 0
 Vanstone 1,697 0 0
 RABBICH & BROWN (accepted) 1,68c 0 0

WALTHAMSTOW.

For Erection of Weighbridge Offices, New Goods Depot, Wood Street, Walthamstow, for the Great Eastern Railway Company.
 W. SHURMUR (accepted).
 For Alterations, &c., at the Chequers Public-house, Hoe Street, for Messrs. Thorne Bros. Messrs. LEE & PAIN, Architects.
 W. SHURMUR (accepted) £894 0 0

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TENDERS FOR THE YEAR 1892.

THE following are a few of the more important works that were estimated for during 1892, and which appeared in our columns last year :—

BATH.

For Erection of Municipal Buildings, Bath. Mr. J. M. BRYDON, Architect.		
Estcourt, Gloucester	£27,823	0 0
Higgs & Hill, London	26,932	0 0
Grover, London	26,925	0 0
Downs, London	26,410	0 0
H. A. Forse, Bristol	26,350	0 0
Chappell, London	25,860	0 0
Holloway Bros., London	25,843	0 0
Perry & Co., London	25,369	0 0
W. Cowlin & Sons, Bristol	24,913	0 0
A. J. Beavan, Bristol	24,250	0 0
J. Long & Sons, Bath	22,273	0 0
Hayward & Wooster, Bath	22,253	0 0

BELFAST.

For Belfast Main Drainage, Contract No. 7.

R. C. Brebner, Edinburgh	£41,106	0 0
Dixon & Campbell, Belfast	39,950	0 0
Workman & Co., Belfast	30,500	0 0
James Perkins, Manchester	30,261	0 0
James Henry, Belfast	29,882	0 0
H. & J. Martin, Limited, Belfast	29,047	0 0

CARDIFF.

For Building Infectious Diseases Hospital, Canton, Cardiff, for the Cardiff Corporation. Mr. W. A. HARPUR, Borough Engineer, Architect.

Stephens, Bastow & Co., Bristol	£30,999	0 0
D. J. Davies, Cardiff	29,990	0 0
J. Strachan, Cardiff	29,177	0 0
Latty & Co., Cardiff	28,289	0 0
J. Allan, Cardiff	28,198	0 0
J. Haines, Cardiff	27,997	0 0
C. J. Dunn, Cardiff	27,721	0 0
H. Davies, Cardiff	25,870	0 0
E. Turner & Sons, Cardiff	24,858	0 0

CODFORD.

For Building the Bath and Somerset Lunatic Asylum, Codford. Messrs. GOUGH & TROLLOPE, Architects, 28 Craven Street, Charing Cross, London.

Westleigh Stone.

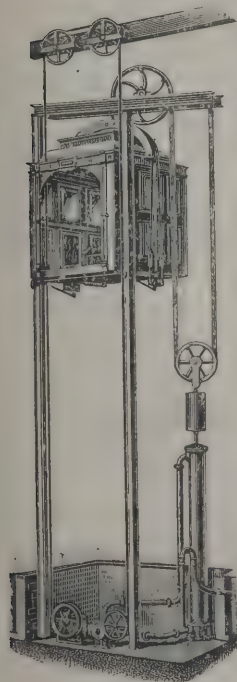
Pallinson, London	£164,942	0 0
Pollard, Bridgwater	158,282	0 0
Facey, Taunton	145,439	0 0
Cowlin, Bristol	144,773	0 0
Sanders, Southampton	144,500	0 0
Pollard, Taunton	139,535	0 0
Lovatt, Wolverhampton	138,719	0 0
Beaven, Bristol	137,000	0 0
Willcocks, Wolverhampton	135,390	0 0
Reed, Plymouth	133,971	0 0
Pethwick Bros., Plymouth	129,994	0 0
Girling, Ipswich	129,629	0 0
Morgan, Southampton	118,886	0 0
Gooding, Exeter	116,393	0 0
Phillips, Exeter	114,000	0 0

DEVONPORT.

For Building Workmen's Houses, Devonport. Mr. W. N. RICHARDS, Architect, Devonport. Quantities by Mr. G. H. BRYANT, 31 Gladdon Terrace, Plymouth.

S. Perkins, Devonport	£18,942	16 6
J. Julian, Truro	17,500	0 0
A. N. Coles, Plymouth	16,824	0 0
Cole & Fox, Plymouth	16,764	4 2
Blowey, Plymouth	16,750	0 0
Crockerell, Devonport	16,479	0 6
A. R. Lethbridge & Son, Plymouth	16,065	0 0
Williams & Westlake, Stonehouse	15,981	18 0
W. Trevena, Plymouth	15,750	0 0
J. Partridge, Plymouth	15,645	0 0
Wakeham Bros., Plymouth	15,227	17 2
A. Andrews, Plymouth	14,965	0 0
T. May, Plymouth	14,817	0 0
Reed, Blight & Co., Plymouth	14,744	10 0
H. Kerswell, Plymouth	14,528	0 0
S. Roberts, Plymouth	14,307	4 0
G. Shellabear, Plymouth	12,260	0 0

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Exeter Cathedral	Eddystone Lighthouse
Llandaff "	Birmingham Municipal Buildings
Wells "	Hove Town Hall
Silgo "	Burnley, Holy Trinity Church
Bradford Town Hall	Crawley Parish Church
St. James's Palace London	Corbridge-on Tyne Parish Church
Sherborne Abbey	Windermere Church
Sydney Town Hall, N.S.W.	Durban Town Hall, S.A.
Eiffel Tower, Paris	Royal Military Exhibition, &c., &c., &c.
GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1885.	
SILVER MEDAL—PARIS 1889.	

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more Cathedral, Sherborne Abbey, Wandsworth
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Eton; Corpus Christi College, Oxford, &c., &c.

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COVENTRY.

For Building Coventry Public Baths. Mr. HAROLD T. BURGESS and Messrs. SPALDING & CROSS, Joint Architects. Messrs. F. G. W. BUSS & G. FLEETWOOD, Surveyors, 15 Furnival's Inn, W.C.			
Balaam Bros., London	£18,999	0	0
F. N. Stephens, Aston	18,600	0	0
Gould & Brand, London	18,179	0	0
J. T. Wingrove, Northampton	16,978	0	0
Reed, Blight & Co., Plymouth	16,935	0	0
T. Lowe & Sons, Burton	16,550	0	0
J. Allen & Sons, London	16,417	0	0
G. F. Smith & Sons, Leamington	16,290	0	0
C. G. Hill, Coventry	15,076	0	0
C. W. King, Cheltenham	13,500	0	0

EAST DULWICH.

For Building Workhouse, East Dulwich. Mr. T. W. ALDWINCKLE, Architect, 1 Victoria Street, S.W. Quantities by Mr. R. C. GLEED, Adelaide Place, London Bridge, S.E.			
Garlick & Horton, Limited, Sloane Street	£77,640	0	0
Reed, Blight & Co., Plymouth	72,777	0	0
W. Brooks, Folkestone	72,079	0	0
Balaam Bros., Old Kent Road	71,806	0	0
J. T. Chappell, Pimlico	69,420	0	0
Lawrance & Son, City Road	68,040	0	0
H. L. Holloway, Deptford	66,215	0	0
J. Allen & Sons, Kilburn	65,888	0	0
Leslie & Co., Kensington Square	65,264	0	0
Braide & Co., Basinghall Street	65,000	0	0
Kirk & Randall, Woolwich	61,922	0	0
F. & F. H. Higgs, Loughborough	61,000	0	0

GODALMING.

For Construction of Main Outfall Sewer, Manholes, Ventilators, Distributing Tanks, Receiving Well, Pumping Station, Laying Out and Drainage of the Filtration Area, &c. Mr. H. MOON, Surveyor, High Street, Godalming.			
W. T. Botterill, London	£20,215	0	0
J. Neave, Forest Hill	15,481	0	0
T. Kavanagh, Surbiton Hill	14,853	11	0
R. R. Facey, Taunton	14,056	10	0
B. Cooke & Co., Battersea	13,910	0	0
W. Cunliffe, Kingston-on-Thames	13,747	11	0
P. Peters, Horsham	12,100	0	0
Morgan, Isted & Morgan, Southampton	10,416	0	0

GUILDFORD.

For Construction of High and Low Level Intercepting Sewers. Contract No. 2.			
Sewage Outfall Works, Pumping Station, &c.			
Stephens, Bastow & Co., Bristol	£38,526	0	0
Peters, Horsham	36,483	0	0
G. Geen, Newport, Mon.	36,000	0	0
R. Finnegan, Northampton	35,500	0	0
J. Band, Wisbech	29,440	0	0
J. Dixon, St. Albans	26,506	0	0
Peattie & Axtel, Kensington	26,215	0	0
T. P. Hall, Southsea	26,000	0	0
Bentley, Leicester	25,756	3	11
G. Osenton, Westerham	25,174	0	0
J. Neave, Forest Hill	24,689	0	0
J. Hayward, Eastbourne	24,195	0	0
B. Cooke & Co., Battersea	21,990	0	0
W. Nichols, Wood Green	20,186	0	0
W. Cunliffe, Kingston	18,547	0	0
Morgan & Co., Southampton	18,486	0	0
M. W. Roles, London	14,800	0	0

HORNSEY.

For Building Schools, &c., Frobisher Road, Hornsey, for the Hornsey School Board. Mr. CHAS. BELL, Architect. Quantities by Mr. H. LOVEGROVE.			
Anley	£23,027	0	0
Payne & Son	22,926	0	0
Bryan & Son	22,813	0	0
Rowe Bros.	22,788	0	0
Lawrence & Sons	22,012	0	0
J. W. Dixon	21,999	0	0
B. E. Nightingale	21,776	0	0
R. G. Battley	21,691	0	0
Maddox Bros.	21,649	0	0
Allen & Son	21,259	0	0
C. Dearing & Son	21,229	0	0
Holliday & Greenwood	21,137	0	0
Yerburg	21,076	0	0
Hepwell	19,300	0	0
Coxhead	19,229	0	0
C. Wall	18,833	0	0
F. Stevens	17,308	0	0

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J. Bentley, Woodhouse Carr	68,222	13	3
W. Ives & Co., Shipley	66,744	0	0
Gould & Stevenson, Leeds	62,470	15	8
Armitage & Hodgson, Leeds	61,442	0	0
B. Graham & Sons, Huddersfield	60,197	0	0
T. Obank & Sons, Idle	58,241	10	0

LEWISHAM.

For Erecting New Infirmary, High Street, Lewisham, for the Guardians of the Lewisham Union. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street. Quantities by Messrs. FRANKLIN & ANDREWS, 25 Ludgate Hill, E.C.

Allen & Sons	£62,876	0	0
Shillitoe & Sons	58,953	0	0
C. Wall	54,675	0	0
C. Miskin	54,394	0	0
Leslie & Co.	54,250	0	0
Patrick Webb	53,780	0	0
A. Kellett	52,674	0	0
Higgs & Hill	51,974	0	0
T. O. Richardson	51,450	0	0
W. Johnson & Co., Wandsworth	51,000	0	0
W. Brook	50,850	0	0

LIVERPOOL.

For Building Workhouse Infirmary, Toxteth Park. Messrs. ELLISON & SON, Architects, Liverpool.

I. Dilworth	£39,192	0	0
Morrison & Sons	33,878	10	0
W. Thornton & Son	33,009	9	3
J. Henshaw & Sons	32,592	10	0
J. Taylor	31,781	0	0
S. Webster	31,500	0	0
Paterson & Sons	31,430	0	0
Raffle & Campbell	30,989	0	0
C. Burt	30,793	0	5
Brown & Backhouse	30,056	16	9
Kelly Bros.	29,580	13	8

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Mr. HORACE E. DAVEY, Architect, Selhurst, S.E. Quantities by Messrs. HEELIS & WRIGHTSON, Budge Row.

Holloway Bros.	£34,415	0	0
Colls & Sons	33,890	0	0
Patman & Fotheringham	33,681	0	0
Dearing & Son	33,500	0	0
F. & H. F. Higgs	33,420	0	0
Perry & Co.	32,997	0	0
Lawrance & Sons	32,979	0	0
L. H. & R. Roberts	32,798	0	0
W. Downs	32,777	0	0
Burman & Sons	32,500	0	0
Kilby & Gayford	32,434	0	0
Knight	32,209	0	0

For General Offices, Workrooms and Receiving Wards, &c., at Poplar, for the Guardians. Messrs. WALTER A. HILLS & SON, Architects, 149 Bow Road. Quantities by Mr. HENRY POSTON, F.S.I., 39 Lombard Street.

Harris & Wardrop	£23,600	0	0
Perry & Co.	25,120	0	0
John Mowlem & Co.	24,864	0	0
J. O. Richardson	24,327	0	0
Mark Patrick & Son	24,270	0	0
W. H. Lascelles & Co.	23,998	0	0
Joseph Holland	23,990	0	0
W. Shurmur	23,598	0	0

For Building Ward's Schools, Thames Embankment, for the Land and City Courts' Committee of the Corporation of the City of London.

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Lascelles	19,759	0	0
Chessum	19,610	0	0
Lawrance & Son	18,800	0	0
Charteris	18,547	0	0
J. T. Chappell	18,547	0	0
Brass & Son	17,843	0	0
Nightingale	17,547	0	0
Kirk & Randall	17,420	0	0
Kilby & Gayford	17,236	0	0
Perry & Co.	17,227	0	0
Mowlem & Co.	16,976	0	0
Atherton & Latta	16,812	0	0

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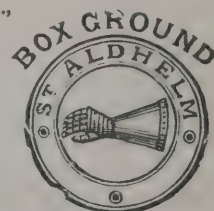
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Shillitoe & Son	£67,500	0	0
Reed, Blight & Co.	64,662	0	0
Mark Patrick	58,200	0	0
Kirk, Knight & Co.	56,648	0	0
Lawrance & Son	54,042	0	0
Leslie & Co.	53,930	0	0
W. Brooks, Folkestone	50,861	0	0

For Building St. Catherine's Church, Hatcham. Messrs. STOCK, PAGE & STOCK, Architects, 9 Denman Street, London Bridge. Messrs. WIDNETT & TROLLOPE, Surveyors, Westminster.

Peto Bros.	£23,170	0	0
Stimpson	23,050	0	0
Stephens, Bastow & Co.	22,999	0	0
W. Downs	22,820	0	0
S. & W. Pattinson	22,534	0	0
T. Rider & Son	21,928	0	0
Collins	21,786	0	0
S. J. Jerrard	21,779	0	0
H. L. Holloway	21,680	0	0
Dove Bros.	21,455	0	0
B. E. Nightingale	21,390	0	0
Brown, Son & Blomfield	20,850	0	0
Goddard & Son	20,835	0	0
Rudd & Son	20,400	0	0
Higgs & Hill	19,984	0	0

For Main-beam Engines and Works connected therewith, at Abbey Mills Pumping Station, for the County Council.

	Four engines.		Eight engines.
Pollit & Wigzell, Lim.	£19,250	14	0
J. Penn & Sons	18,200	0	0
Fullerton, Hodgart & Barclay	15,320	0	0
Thames Ironworks Co.	13,500	0	0
Clayton, Goodfellow & Co.	13,000	0	0
Easton & Anderson, Lim.	12,600	0	0
J. Watt & Co.	10,400	0	0
Yates & Thom	10,400	0	0
B. Goodfellow	10,200	0	0
			£35,650
			29,500
			25,300
			22,500
			21,800
			21,400
			17,250
			16,980
			19,200

LONDON—continued.

For Additions to Guildhall, Westminster, for the Middlesex County Council. Mr. F. H. POWNALL, Architect.

Leslie	£18,787	0	0
Allen & Sons	18,465	0	0
Nightingale	18,300	0	0
Mowlem	17,953	0	0
Dove Bros.	17,945	0	0
Roberts	17,775	0	0
Cubitt	17,760	0	0
Holland & Hannen	17,300	0	0
Colls	17,190	0	0
Chappell	16,849	0	0
Higgs & Hill	15,740	0	0

For Alterations and Additions to Administrative Buildings at the Northern Hospital, for the Metropolitan Asylums Board. Messrs. PENNINGTON & BRIDGEN, Architects.

J. Bentley, Leicester	£13,880	0	0
G. E. Todd, Hackney Road	10,779	0	0
J. W. Dixon, Highgate	10,569	16	0
G. Godson & Son, Kilburn	10,409	0	0
Wall & Co., Kentish Town	10,378	0	0
Kirk & Randall, Woolwich	10,241	0	0
W. Shurmer, Upper Clapton	9,990	0	0
Architect's estimate	8,000	0	0

NANTWICH.

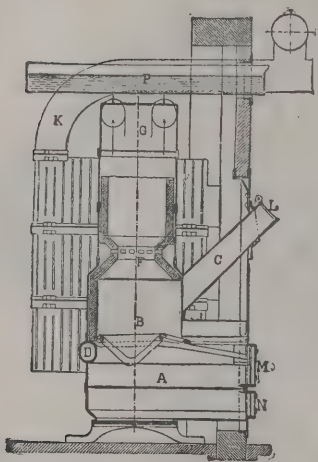
For Erection of Hotel Buildings and Baths, at Shrewbridge Hall, for the Nantwich Brine Baths and Hotel Company, Limited. Messrs. MACKMURDO, HORNBLOWER & WALTERS, Architects, London and Liverpool.

Hotel (exclusive of Works in Old Hall).

Holme & Green	£12,449	0	0
Brown & Backhouse	12,385	0	0
W. Tomkinson & Son	12,072	0	0
Hughes & Stirling	11,490	0	0
J. Mathews	10,538	0	0
W. Brown & Son	10,216	0	0

Baths.

Brown & Backhouse	3,000	0	0
Holme & Green	2,969	0	0
W. Tomkinson & Son	2,943	0	0
Hughes & Stirling	2,690	0	0
J. Mathews	2,495	0	0
W. Brown & Son	2,353	0	0



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Henry Welsh, Hereford	£24,000	0	0
Stephens, Bastow & Co., Limited, Bristol	23,429	0	0
John Jenkins, Newport	22,800	0	0
Frank Ashley, Barry Dock	19,000	0	0
Morgan & Roberts, Newport	18,000	0	0

NORWOOD.

For Building Model Home at Norwood, for The British Home for Incurables, H.R.H. Princess of Wales, Patroness. Mr. ARTHUR CRAWSTON, F.R.I.B.A., Architect, 13 Queen Anne's Gate, S.W.

Foster & Dicksee, Rugby	£21,454	0	0
Deacon & Co., Norwood	20,698	0	0
Lorden, Tooting	20,500	0	0
Longley, Crawley	20,470	0	0
Sanders, Southampton	20,072	0	0
Charteris, London	19,704	0	0
Lawrance & Sons, London	19,684	0	0

PORTSMOUTH.

For Building School for 1,112 Children, Southsea, for the Portsmouth School Board. Messrs. RAKE & COGSWELL, Architects, Portsmouth. Quantities by Mr. CHAS. H. BALL, Southsea.

Armitage & Hodgson, Leeds	£13,008	0	0
W. Ward, Portsmouth	12,200	0	0
W. R. & C. Light, Portsmouth	11,790	0	0
Scammell & Dowdell, Portsmouth	11,700	0	0
A. E. Porter, Portsmouth	11,150	0	0
T. P. Hall, Portsmouth	11,133	0	0
Morgan, Isted & Morgan, Southampton	10,983	0	0
W. Evans, Portsmouth	10,947	0	0
Spriggins Bros., Portsmouth	10,900	0	0
C. Harding, Portsmouth	10,890	0	0
J. H. Corke, Portsmouth	10,850	0	0
T. Quick, Portsmouth	10,797	0	0
H. Jones, Portsmouth	10,753	0	0
W. Learmouth, Portsmouth	10,410	0	0

PLYMOUTH.

For Reconstruction of Portion of Public Market, containing the Corn Exchange, No. 14, Shops, No. 25, Butchers' Stalls and Covered Entrances to Market. Mr. CHARLES KING, Architect, Plymouth. Quantities by Architect.

A. R. Debnam	£23,164	0	0
G. Shellabear	22,735	0	0
J. P. Berry	21,521	0	0
J. F. Blackell	21,013	0	0
Reed, Blight & Co.	20,142	0	0
Pethick Bros.	19,439	0	0
Tozer & Son	19,423	0	0
A. W. Coles	19,250	0	0
J. Finch	19,054	0	0
A. R. Lethbridge & Son	18,640	0	0
T. May	18,488	0	0
S. Roberts	17,725	0	0

TOTTENHAM.

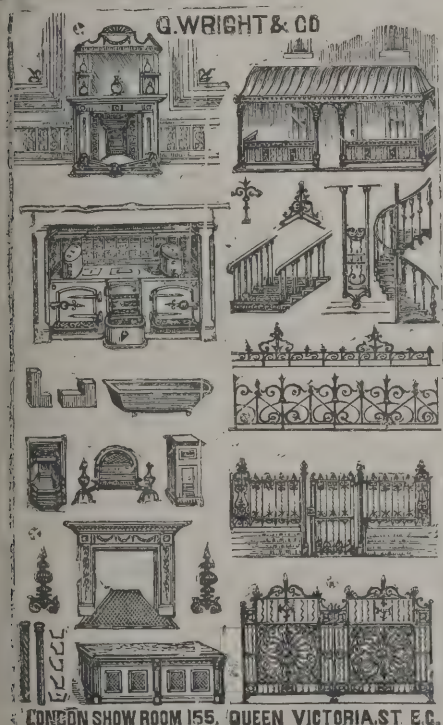
For Building Woodland Park Schools, for the Tottenham School Board. Mr. C. BELL, F.R.I.B.A., Architect, 3 Salters' Hall Court, Cannon Street. Quantities by Messrs. D. CAMPBELL & SON, 69 Finsbury Pavement.

Buckingham & Son	£18,789	9	0
Reed, Blight & Co.	18,516	0	0
A. Kellett	16,700	0	0
W. Brass & Son	16,555	0	0
Perry & Co.	16,547	0	0
Chessum & Sons	16,495	0	0
McCormick & Sons	15,989	0	0
Allen & Sons	15,965	0	0
Percival Hart	15,354	10	0
Charles Wall	15,350	0	0

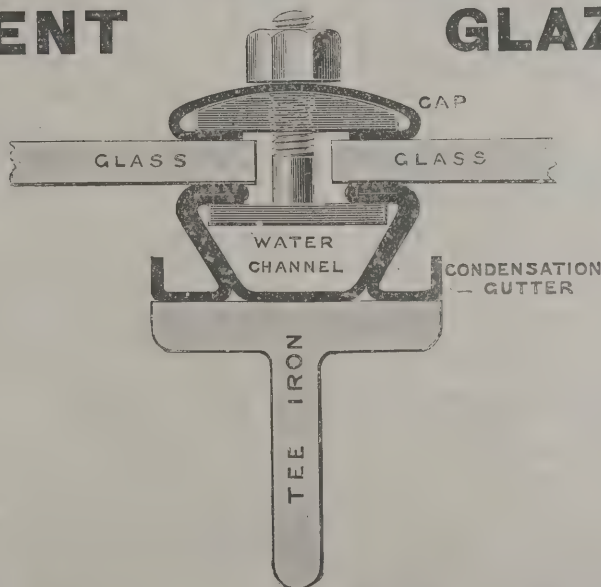
WEST HAM.

For Building Public Hall and Municipal Offices, Barking Road, Canning Town. Mr. LEWIS ANGELL, Architect.

Reed, Blight & Co., Plymouth	£20,941	0	0
J. Robson, Westminster	19,985	0	0
J. Holland, Poplar	19,860	0	0
W. J. Maddison, Canning Town	19,850	0	0
J. F. Coxhead, Leytonstone	19,299	0	0
Perry & Co., Bow	19,159	0	0
Allen & Sons, Kilburn	18,825	0	0
Kirk & Randall, Woolwich	18,718	0	0
A. Kellett, Willesden	17,984	0	0



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Mr. THOS. H. FLEEMING, Architect, Wolverhampton.

Quantities by Architect.

H. Willcock & Co., Wolverhampton	£11,701	0	0
Harley & Sons, Smethwick	11,549	0	0
Guest & Son, Stourbridge	11,420	0	0
Hirton, Brierley Hill	10,850	0	0
Lovatt, Wolverhampton	10,789	0	0

For Supply of Plant, &c., for Electric Lighting of the Borough of Wolverhampton, for the Town Council. Mr. W. H. PREECE, Engineer.

	Continuous Currents.	Alternating Currents.
Electric Construction Corporation	£28,614 10 0	£30,525 0 0
Siemens Brothers	27,105 5 0	29,345 5 0
Crompton	—	28,628 10 0
Brush Electrical Engineering Company	—	31,229 10 0

WOOLWICH.

For Building Public Baths, for the Woolwich Local Board of Health. Mr. H. H. CHURCH, Architect, Woolwich.

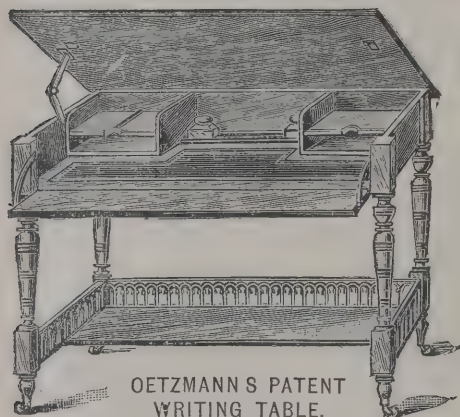
Godson & Sons	£19,963	0	0
Chapman	18,984	0	0
Reed, Blight & Co.	18,832	0	0
B. E. Nightingale	18,225	0	0
Wallis & Sons	17,880	0	0
Kirk & Randall	17,000	0	0
Larder & Son	16,881	0	0
H. L. Holloway	16,530	0	0

For Rebuilding Kent House, Powis Street, Woolwich, for Messrs. Garrett & Co., Limited. Mr. H. H. CHURCH, Architect, Woolwich.

Treasure & Son	£14,880	0	0
Allen & Sons	14,350	0	0
Kirk & Randall	13,555	0	0
Balaam Brothers	12,759	0	0
Woodward & Co.	12,700	0	0
Nightingale	12,355	0	0
Chapman	12,350	0	0
Young & Lonsdale	11,998	0	0
Holloway	11,719	0	0
Munday & Son	11,640	0	0

TREES IN FRENCH CITIES.

THE United States Consul at Bordeaux, in a recent report, says that one of the chief beauties of the larger French cities, and second only to their edifices and monuments, are the trees. The almost interminable vistas of chestnuts and acacias stretching along the broad and well-paved avenues as far as the eye can reach, their bending branches almost touching one another in an endless arch of verdure, form not only a delightful perspective for the eye, but serve to add beauty to cities already beautiful, and grace and symmetry to whatever might be harsh and forbidding. This, however, is not the result of nature's handiwork alone, for science and art have lent their aid. The planting, as well as the maintenance of the trees in French cities, is an item of no little importance in the annual budget prepared by the municipal council, which does not look upon their preservation as of less consequence than the repairing of the roadways or the lighting of the streets. The climate and soil of France are not suited to the nurture and growth of every tree, so that those chosen to line the avenues and boulevards of the cities must be selected with no little judgment. Chestnuts thrive wonderfully. They grow well on a not too rich or generous soil, but require at the same time frequent watering at the roots. Elms are also favourites with the professional landscape gardeners, though they are, unfortunately, extremely susceptible to destruction by worms and insects. Maples grow slowly, but they are hardy and strong. Add to these the acacia, the linden, the sycamore, the oak, and the buttonwood, and the list of trees that live and thrive to advantage in the great Continental cities is nearly complete. France imports a great many of her fruit as well as shade trees, and the utmost care is taken where they shall be planted. Handfuls of earth from every place where a tree is to be placed are carefully examined and analysed. Upon ground rich and moist trees from the United States grow best. A sandy soil is most favourable to resinous trunks, and so on. In squares and parks, though more especially along the principal thoroughfares, where the trees are planted about 20 feet apart, particular attention is given to the replacing of the dead or dying by healthy trees of the same species. In this way the line of perspective is never broken, nor is the eye repelled by the absence of a single trunk. One reason for the great care which the French bestow upon their arteries of traffic is that the nation, as a whole, spends, whenever the weather permits, the best part of its leisure time in the open air. The

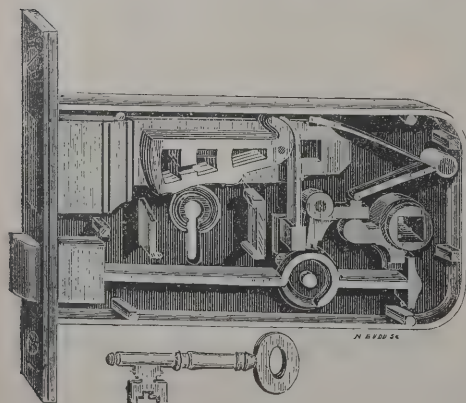


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Frenchman looks upon the streets of his native city and the adornment of the same much as an Englishman or an American does upon the decoration of his house. "Charles Kingsley is authority for the statement that verdure is just as essential to life as air itself, and that the kitchen garden of the labourer goes as much to add a touch of sunshine to his moral being as a bunch of roses to an invalid or the Royal Park to the Queen of England. The proof of the theory, which is a truer one than may at first appear, is in the witnessing of the crowds of poor that flock in summer-time to any spot where grass and foliage exist. The French know this. They plant trees and lay out flower-beds in every available corner within their cities' boundaries, while the benefit wrought thereby is too self-evident to demand interpretation."

TRADE NOTES.

THE new Board Schools, Brecon, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE directors of the Clay Cross Water Company have instructed Mr. W. H. Radford, C.E., of Nottingham, to report as to the best method of increasing the pressure in the town, as to the advisability of relaying and enlarging service-main, as to the necessity for storage of water, and as to the present filtering arrangements.

A LOCAL GOVERNMENT BOARD inquiry was held at the Town Hall, Mold, to consider an application from the Local Board to borrow 4,500*l.* for the intercepting sewers and sewage disposal of Mold. Mr. W. H. Radford, C.E., of Nottingham, is the engineer of the scheme.

THE Accrington Gas and Water Company have deposited a Bill for power to raise further moneys "for the purposes of improving and extending their existing works for the supply of gas and water, and for the general purposes of their undertaking."

ADDITIONS have been made by Mr. E. Denison, cloth manufacturer, Westfield Mills, Yeadon, near Leeds, to his extensive works, which, being at the Guiseley end of the town, has been hitherto without a public timekeeper. Mr. Denison has built a clock tower in his extensions, and has fixed a first-class clock, showing the time on two 6-foot illuminated dials, and fitted with automatic gas apparatus, Lord Grimthorpe's gravity escape-

ment, compensated pendulum, and all the latest improvements, and will be lit up for the first time this week. The new clock has been made and fixed by Messrs. Potts & Sons, of Leeds, who made the Yeadon Church clock, fixed about forty years ago; Yeadon Town Hall clock, presented by Mr. J. Peate; Messrs. Brown & Brayshaw's mill clock; also the adjoining church clock at Guiseley, erected over forty years—the whole of which have gone well, and given every satisfaction.

WE learn that Messrs. John Gibbs & Son (warming and ventilating engineers, 27 South John Street, Liverpool) have just erected a heating apparatus, on their well-known "Improved Small-bore Pipe" hot-water system, in a large "timber drying-room" in Liverpool with excellent results, the proprietor now claiming to have the largest and best drying-room for timber in Liverpool. The furnace is constructed on an improved principle, whereby the awkward drop fire-bars are entirely done away with, still permitting of easy access for cleaning from the front; it can be fed either from the top or front as may be desired. We may say this firm are the inventors and proprietors of the well-known "Gibbs' Fireplace Lintel," for the prevention of smoky chimneys, while at the same time improving the construction of flues. This latter invention is well known to architects.

THE new Roman Catholic church now being erected at Tenby is being ventilated by the "Climax" Ventilating Co., Limited, of 15 Great George Street, Westminster, S.W., and 93 Hope Street, Glasgow, their patent, direct-acting ventilators being used for the extraction of vitiated air, the fresh air being admitted through improved inlets.

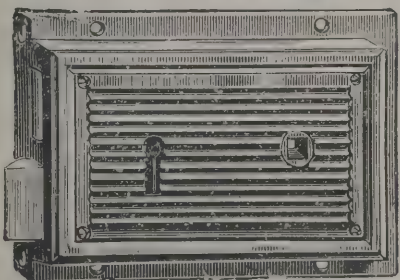
BUILDING AND BUILDERS.

THE Tontine Hotel, a large house at 9 Ardgowan Square, Greenock, is to be converted into a first-class hotel, for Mrs. Buchanan. The purchase was made privately, after the property had been put up to auction and found no bidders.

THE trustees of the Greenock Eye Infirmary have decided to erect a new eye infirmary suitable to the wants of Greenock and Port-Glasgow. A local gentlemen has agreed to supply the funds.

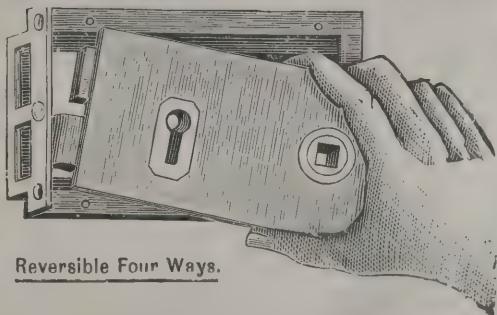
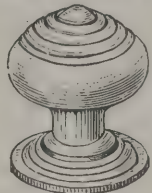
AT a meeting of the special committee of the Governors of Robert Gordon's College, Aberdeen, to consider the proposed extension and heating and ventilation of the buildings, Mr.

HILL'S PATENT LOCKS AND OTHER FITTINGS.



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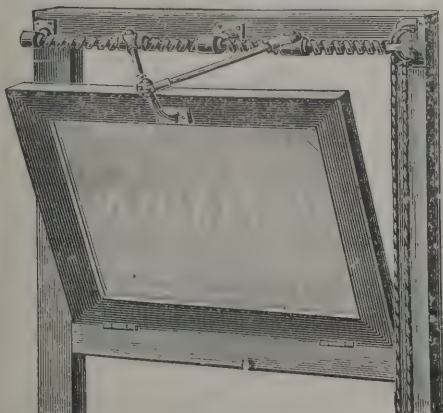
(Patent Bolt for Narrow Stiles.)



Reversible Four Ways.

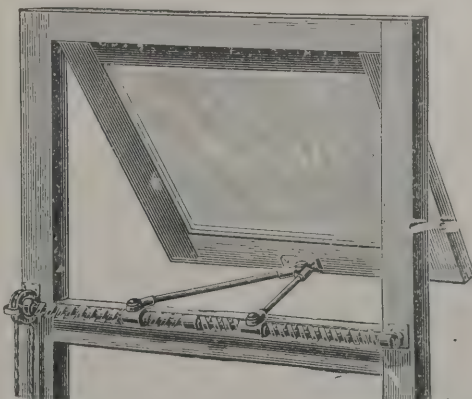
Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod on right or left side.

(Triple-Action Bolt.)



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Marr, architect, submitted the plan and specification for the heating and ventilation, which showed that, along with the extension of the buildings, an outlay of nearly 8,000*l.* would be incurred. The cost of the extension, without the heating and ventilation, was estimated at nearly 5,000*l.* The consideration was deferred.

IN accordance with a wish expressed by Mr. James Williamson, M.P., who recently paid in to the credit of the new infirmary fund at Lancaster the sum of 5,000*l.*, the committee have decided to proceed forthwith to erect the building upon modified plans at a cost of about 17,000*l.* The president, Mr. W. Smith, M.P., has undertaken to erect the children's ward, for which 1,000*l.* will be required. Towards the total cost between 12,000*l.* and 13,000*l.* has been raised or promised.

AT the meeting of the Bridgnorth Town Council, the special committee appointed to consider the question of providing dwellings under the provisions of the Working Classes Act 1890, reported that a public conference had been held with the working-men, and the eligibility of several sites was also discussed. The working-men delegates had selected a set of plans, and expressed a desire that any dwellings provided should have not less than three bedrooms (with separate access), two living-rooms (or parlour and kitchen), with detached washhouse; also a passage at back of premises between each portion of dwellings, and as much garden as possible, for a total rental not to exceed 3*s.* 6*d.* per week. The committee had agreed to submit the selected plans to the borough surveyor for his report and amendment, and had also instructed him to prepare for the committee's guidance an approximate estimate for the erection on one of the sites of twelve dwellings in three blocks of four. The report was adopted.

A NEW nurses' home has been proposed for the Leeds Workhouse Infirmary at Burmantofts. The scheme is now assuming definite shape. It was decided to erect on ground adjacent to the infirmary a building to accommodate from 30 to 40 nurses. There will be a general dayroom, private sitting-rooms for the matron and assistant matron, and a separate bedroom for each nurse. New receiving-wards are also to be erected near the entrance in Beckett Street. Mr. Winn is the architect.

MR. ROBERT DENNETT, of London and Nottingham, has accepted the presidency of the National Association of Master Builders of Great Britain for this year.

ELECTRICAL.

THE Bristol Electric Safety Lamp Works are carrying out the work of electric lighting of omnibuses, for the London General Omnibus Company. The battery weighs about 8 lbs. and is placed in a wooden box under one of the seats. The box is provided with two brass spring terminals which make automatic contact with the battery when it is let down into the box. The lamp is of a special manufacture and is made as small as possible to allow it being placed in the centre of the roof, and for the same reason the incandescent lamp is suspended horizontally instead of vertically. By this arrangement a maximum amount of light is obtained and risk of breakage is avoided. The batteries and lamps are made by the Bristol Electric Safety Lamp Works, 40 Great Smith Street, Westminster, and covered by their patents. About seventy busses have been lighted up to the present, and one hundred and forty were to be finished by the end of the past year.

It is proposed that the Dundee Harbour Board take into consideration the propriety of lighting the harbour and docks by electricity, and the desirableness of procuring an electric car to run from the West Station to the cattle depot.

THE Bewdley Town Council have appointed a committee to consider and report upon the desirability of utilising the power of the river Severn for electric lighting, and also for pumping water for domestic and street-watering purposes.

THE adjourned discussion on the report of the Electric Lighting Committee recommending the adoption of a scheme for the introduction of the high-tension system for private supply and deferring for the present the question of lighting the streets with electricity was resumed at the meeting of the Cheltenham Town Council. An amendment referring the matter back to the committee, with a request that they should take further professional opinion upon the scheme recommended by the committee on the advice of Mr. Hall (borough surveyor) and Professor Ayrton, was adopted.

THE Heckmondwike Local Board of Health have adopted a recommendation of the Electric Lighting Committee, to empower the clerk to take the necessary steps for obtaining permission of the Board of Trade and the Local Government Board to their electric lighting scheme.

PROGRESS is being made towards the lighting of Scarborough by electricity. A site has been decided upon for the erection of the works, the company having purchased two acres

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of land situated in Beaconsfield Street and Salisbury Street, off Seamer Road. The plans are being proceeded with, Messrs. Hall & Tugwell being the architects.

It is proposed that the Runcorn Commissioners appoint a committee to inquire as to the probable cost and practicability of securing an installation of the electric light for the public streets of Runcorn, and to report to the Board at the earliest opportunity.

VARIETIES.

THE Withington Local Board have arranged the purchase of 11 acres of land from Lord Egerton of Tatton for the establishment of a cemetery and the erection of a refuse-destroyer at Withington. Lord Egerton has intimated his intention of presenting to the Local Board two plots of land in Withington, and two in Chorlton-cum-Hardy, for the purpose of recreation.

THE residents at Banchory, N.B., are enjoying an immunity from frozen pipes. Owing to the continuous frost they allowed their water-taps to run all night, with the result that the water has run nearly all out of the reservoir. The public wells are all dry.

AT the meeting of the Islington Board of Guardians a letter was read from the Local Government Board informing the Guardians that they were of the opinion that the proposal of the Guardians to erect a new infirmary on the Tollington Park site would be the best solution of the difficulty to provide adequate and proper accommodation for the sick poor of the parish. The Board assented to the purchase of the site.

A CONVERSAZIONE was held on Tuesday evening, the 3rd inst., at the Archbishop's House, Westminster, to consider a proposal for promoting an Exhibition of Christian Art, to be housed in temporary buildings to be erected in Westminster upon the vacant ground set apart for the future Roman Catholic cathedral. A paper giving an outline of the proposal was read by Mr. Charles T. Gatty. A resolution, proposed by Mr. Gatty and seconded by the Duke of Norfolk, was unanimously passed asking the Archbishop, who presided, to promote the Exhibition.

THE Southport Town Council have rejected the 15,000*l.* scheme for developing the foreshore, and adopted instead an enlarged scheme estimated to cost 20,000*l.* on the first outlay. This scheme embraces an outer marine drive and the joining of the two marine lakes to form a 50-acre sheet for boating and

bathing, the lake to be crossed by a five-span bridge. The new drive will be 24 feet wide, with a footpath on the seaside, and it is contemplated to add an electric tramway, electric works being about to be constructed.

THE Manchester Town Clerk has received a letter from the Local Government Board stating that they are not prepared to sanction the loan of 60,000*l.* for the purchase of the Rampton Manor estate by the City Council for the disposal of sewage.

THE Hornsey Local Board have passed a resolution stating that the alienation of the Alexandra Park and Palace for building purposes would be a lasting injury to the northern suburbs as well as to the metropolis generally, and have expressed their willingness to contribute the sum of 25,000*l.* towards the purchase of the park for the public use. The proposed purchase price is 275,000*l.*

AN inquiry has been held by the Local Government Board into an application by the Local Board of Haverhill to borrow 8,400*l.* for works of water supply, and 1,800*l.* for street improvements. No objection to the proposal of the Board was made.

AT a meeting of the Council of the Tramways Institute of Great Britain and Ireland, held at the Queen's Hotel, Birmingham, Mr. Carruthers-Wain presiding, a discussion took place on the construction and maintenance of permanent way, and a paper was read by Mr. A. Dickinson on the "Overhead Electric Traction Installation in South Staffordshire" just opened.

THE next ordinary general meeting of the Surveyors Institution will be held on Monday, January 9, when papers will be read by Mr. P. D. Tuckett, entitled "A Short Explanation of the Proposed Bi-metallism as affecting British Interests," and Mr. A. Goddard, on "The Currency Question and Land."

AT the meeting of the Worcester City Council it was resolved to increase the filtering area at the waterworks by constructing three additional filters, at an estimated cost of 4,500*l.*, repayable in thirty years.

THE *Leeds Mercury* says a strong room has just been opened in the new Joint-Stock Bank in Park Row, Leeds. This is designed to give absolute security against fire, thieves and falling buildings. On the outside are firebricks, in the inside a lining of steel half an inch in thickness, and between the two 18 inches of solid concrete, in which the iron ribs of the structure are embedded. The door is of great thickness, but that is not its most remarkable feature. The most ingenious

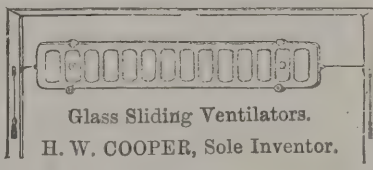


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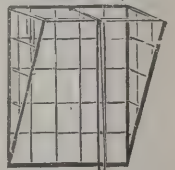


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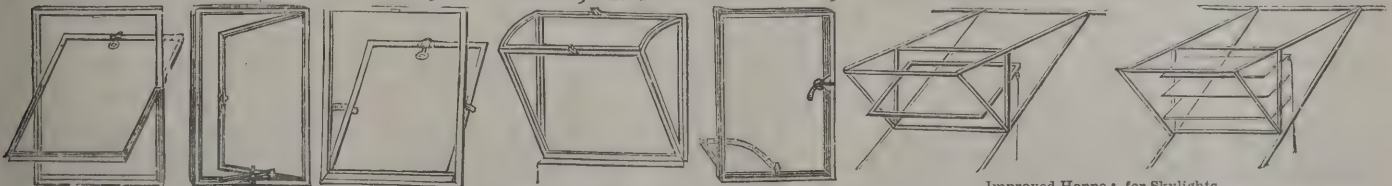
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cracksman would be lucky if he discovered within a week the twists and turns by which it is made to withdraw its numerous and heavy bolts. Then the making of the keys would probably engage his attention another week. Nor would this be all. When he had got the door opened, he would have a no less difficult task in getting beyond the ponderous steel bars which form an additional barrier. But before he attempted this, electric bells would have announced his presence, and ere he was aware of his danger he would wish that he had not attempted so foolish an exploit.

THE Aston Local Board have sanctioned plans and specifications for the making of Sandy Lane and Thimble Mill Lane, at an estimated cost of 1,750*l.*, and that application be made to the Local Government Board for a loan. They also approved of plans for another theatre at Aston Cross, subject to satisfactory provision being made for ingress and egress.

THE following officers of the Aberdeen Granite Association have been elected:—President, Mr. William Boddie; vice-president, Mr. William A. Stewart; treasurer, Mr. Alexander Wilson; delegate, Mr. James McIntosh; directors, Messrs. John Donald, John Dunn, W. Edwards, R. Gibb, James Hunter, James Pope; secretary, Mr. James S. Jeffrey.

NOTES ON NOVELTIES.

Merrill's Patent Flush Tank and Trough Closet.—

These have been designed with the object of providing a thoroughly reliable automatic flushing closet, without the drawbacks hitherto experienced in consequence of the fouling of the trough from defective formation and from the failure of the flush tank. Merrill's tank has neither air-holes nor small pipes, which, as was proved by the Sheffield Corporation trials, wherever present, choke up and stop the action. It is self-trapping, and untraps at the end of every flush, will work equally well with clean or dirty water, and when used with waste water for flushing drains requires no grease-trap. The action is as follows:—There is placed below the tank a tumbler or tipping-bucket, into which the long leg of the syphon dips, reaching nearly to the bottom. When the water in the cistern rises to the bend of the syphon it runs down the long leg into the tumbler, thus trapping the syphon and confining the air contained in it. As a consequence the water in the cistern rises above the bend of the syphon in about the same proportion as in the tumbler. When the tank is filled the

tumbler also is filled to its tipping-point, and it discharges its contents, unsealing the syphon, which is instantaneously charged by the head of water in the cistern. The tumbler remains tipped until the finish of flush, when the air passes up the syphon, effectually unsyphoning it, thus dispensing with the usual leak-off holes or small syphons. The Sheffield trials proved that this tank could not be put out of order without actual destruction, and was thus reported upon by Mr. G. Alsing, A.M.I.C.E., and Dr. Harvey Littlejohn, medical officer of health:—"The only cistern which came absolutely scatheless out of the several tests to which they were subjected was that of the Water Carriage Engineering Company, which never failed to flush under any conditions, and which moreover is from its construction extremely unlikely to get out of order, or admit of its being easily tampered with. We are therefore of opinion that of all the cisterns which we have subjected to observation, this one is the most reliable in every way, and that under all ordinary conditions it can be depended on to act automatically and with regularity."—Sheffield Corporation report. The trough is egg-shaped, and has a straight back and front which gives the flush the greatest scouring power. The rear is set well back from the seat to escape fouling. As a result of this method of construction a considerable depth of water is retained in the trough, and the flush rises nearly to the top of the trough. The before-mentioned report of the Sheffield Corporation says of this:—"The form of trough which undoubtedly seems to us to be most favourable to a good flush is a triangular one, as exemplified in the two examples of the Water Carriage Engineering Company. By adopting this form a minimum quantity of water reaches a maximum amount of surface, or in other words, with the same volume of water as in the other forms, less surface liable to be soiled remains unaffected by the flush." They are manufactured by the Water Carriage Engineering Company, Limited, Sheffield.

BUILDING TRADES.

THE *Glasgow Herald* says the building trades have been unusually active during the past year. Not since the failure of the City Bank have wages been so high as now. Specially does this remark apply to masons and bricklayers. Locally these branches have been brisker than others in consequence of the large number of public works—railway, &c.—now in progress;



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and besides these there are the new asylums in course of erection by the boards of the city, the barony, the Govan, and by the county at Hartwood. These are all large mason jobs, and they have made masons really scarce. Wages have consequently risen, and at some jobs fully 2*l.* per week has been paid for the services of a journeyman mason. Bricklayers have been able to command as high wages as masons. Joiners have not been quite so well off. The lull in shipbuilding always sends a large number of ship-joiners into the building trade, and, therefore, labour in that department has not been so scarce. Plasterers and plumbers have been very busy, especially the latter; the action of the health committee, in forcing the adoption of sanitary arrangements to a large number of old houses, has created quite a boom among plumbers. The other branches of the trade have been fully employed, and shared the general prosperity. House-building has been active, and received a spurt in consequence of the promotion by the Corporation of the New Buildings Regulation Bill. Just before the Bill became law, the Dean of Guild Court was crowded with new plans for dwelling-houses.

In connection with the building trade, the following table shows the linings granted by the Dean of Guild Court during the year, along with the estimated valuations:—

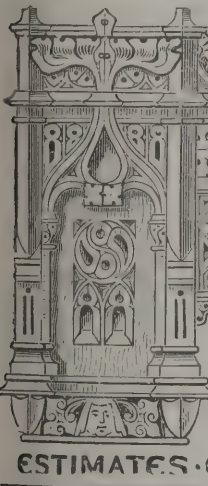
Nature of Application.	No. of Warrants.	Valuation.
Churches, halls, schools, and other buildings for public purposes, with alterations thereon	4	£33,750
Warehouses, offices, workshops, stables, byres, &c., and alterations thereon ...	110	254,750
Alterations on shops and dwelling-house property, with additions thereto	314	172,840
New buildings for shops and dwelling-houses	112	445,400
	540	£906,740

Any comparison with the previous year would be misleading in so far as regards these statistics, as they include all the districts added to the city on November 1, 1891, the statistics of which previous to that date we have not got. But it may be stated that any increase within the boundaries of the city previous to that date can be accounted for in the increase of applications for the construction of water-closets and internal alterations upon dwelling-house property necessitated by the Police Amendment Act of 1890.

Memorandum of Linings Granted by Dean of Guild Court.

District.	Apartments.						Shops.	Valuations.	No. of Lngs.	
	1.	2.	3.	4.	5.	6.	Sin'e.	D'le.		
Central.....A	24	72	22	3	1	1	13	17	£27,900	6
Western ...B	—	11	32	—	—	—	7	7	15,890	3
Eastern ...C	48	201	227	32	—	7	40	16	108,850	28
Southern ...D	92	118	21	—	—	—	11	5	27,800	6
Northern ...E	12	28	75	29	19	3	5	2	39,200	7
St. Rollex...F	25	122	69	3	—	—	19	5	31,800	8
G	—	10	126	14	21	42	6	3	89,000	27
H	55	181	129	35	9	23	13	9	103,050	27
	256	743	701	116	50	76	114	64	£445,400	112
Churches, halls and schools									£33,750	4
Warehouses, stores and workshops									254,750	110
Alterations and additions									172,840	314
									£906,740	540

During the past year the building trade of Edinburgh has been steadily prosperous, a decline noticeable in the winter months being natural and inevitable, and affording no symptom of an impending dulness. There has been little friction between masters and workmen, and wages have risen in several of the branches of the trade without resort to the method which during the year has wrought such havoc in other industries elsewhere. The masons who now, like the joiners, possess a Conciliation Board, were in May granted a rise of $\frac{1}{4}$ *d.* per hour, which brought the wage to the standard of 1891—viz., 8 $\frac{1}{4}$ *d.* The standard for joiners is now 7 $\frac{3}{4}$ *d.*, an increase of $\frac{1}{4}$ *d.* having been given six months ago, while plasterers have throughout the twelve months enjoyed the extra $\frac{1}{4}$ *d.* an hour, bringing their wage to 8*d.*, which was obtained in January last. Plumbers also have risen $\frac{1}{4}$ *d.*, their standard wage being 7 $\frac{1}{2}$ *d.*, and painters and decorators have earned good wages, varying from 7 $\frac{1}{2}$ *d.*, the standard figure, to 10*d.* and 1*s.* per hour for ordinary work, and from 9 $\frac{1}{2}$ *d.* to as much as 1*s.* 4*d.* for overtime. The wages agreement between masons and their employers will be reconsidered in May 1893. It is satisfactory to report that the trade activity has not to any considerable extent been due to the speculative building which was so



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prevalent a few years ago, and which of course was succeeded by reaction and depression. There was a decrease on the number of warrants granted by the Dean of Guild Court for house property of a first-class character, but the total number of warrants showed an increase, a goodly proportion being for alterations on existing buildings. A great part of the employment in the trade was, however, due to warrants granted in previous years for such undertakings as the M'Ewan Hall, which still engages a large staff of men, although quickly approaching completion. The building is a piece of magnificent workmanship, and when the thoroughfare improvements in its neighbourhood for which the Corporation have made provision take place, it will be possible to regard it as an architectural monument of which the citizens have reason to be proud. At present, hemmed in as it is by buildings of an inferior kind, it is impossible to get more than a glimpse of its outlines. The station works promoted by both the railway companies have been pushed forward rapidly. The new Caledonian Railway Station will be finished in the early months of the year, and is already so far completed as to allow the carriage stands to be used. The North British Railway alterations and extensions are, of course, of a different character, but a good deal of work has been provided for masons in the construction of retaining walls. Another work at the western extremity of Princes Street, the re-erection of St. Cuthbert's Parish Church has made rapid progress. The only portion of the old structure which remains is the steeple, and it appears rather dwarf-like attached to a building which, Dr. Macgregor says, will be, when completed, the largest parish church in Scotland. One of the buildings begun and finished during the year was the Empire Theatre on the site of Newsome's Circus. A structure of a more important character, at which over a hundred men are employed, is the National Observatory on the Blackford Hill. The contract price is over 30,000*l.*, and the work will not be ended for over two years. Other contracts which either have given or continue to give employment to large bodies of workmen are the extension of the General Post Office, the new police station in Gayfield Square, additions to the North British Distillery and Biscuit Works in the western portion of the city, the Scottish Wholesale Co-operative Company's roller-mills at Chancelot, the new bank premises in Cockburn Street, the Corporation refuse-destructor at Powderhall, a new U.P. church in Polworth Gardens, the additions to George Watson's Colleges for boys and girls and the extension of the Royal Infirmary. The last-mentioned is a very important work, upon

which it is in contemplation to spend a large sum. House-building operations have gone forward satisfactorily, especially in the southern suburbs of the city. The Morningside district is steadily developing in popularity. At the point about which it joins the trading portion of the city, the villas that a few years ago were so numerous and so closely sequestered from the vulgar gaze by walls and plantations have been entirely obliterated by huge tenements or are about to undergo that process. At the opposite extremity of the district villas of a smaller size have sprung up, and as the rents are moderate and the train and tram communication with the town is sufficient, there is but little unlet property. In the Newington district there has also been a good deal of building, including several business premises. Efforts have been made to procure a railway station on the line of the circular route in the neighbourhood of Cameron Toll, but they have not yet been successful. Meanwhile there are some important works in this locality, and it is believed that with better railway communication there would be a considerable amount of feuing possible. In the other portions of the city, beyond the large undertakings already referred to, operations have been of an ordinary character, though mention may be made of a tenement in Ramsey Gardens which Professor Geddes, who is well known for his views on the housing of the poor, is erecting. For the coming year the outlook may not be so bright as builders would like, but it is not destitute of promise. The recent fire in Princes Street having demolished a large building, another of no doubt more imposing dimensions will shortly be begun. Then the erection of the Sick Children's Hospital, the reconstruction of the County Buildings, the extension of the Royal Infirmary, a Board school for the south-western district and the new place of worship for Morningside Free Church congregation will provide work for a large number, besides the undertakings which are still on hand and others that the future always succeeds in discovering.

THE PROPOSED CHANNEL BRIDGE AND RAILWAY.

THE Bill promoted by a company which has in view the ultimate construction of a bridge or viaduct over the English Channel, with a railway thereon, has been deposited in the Private Bill Office of the House of Commons. It contains 13 clauses, and merely asks Parliament to empower the company, "either alone or jointly with any other companies, Govern-

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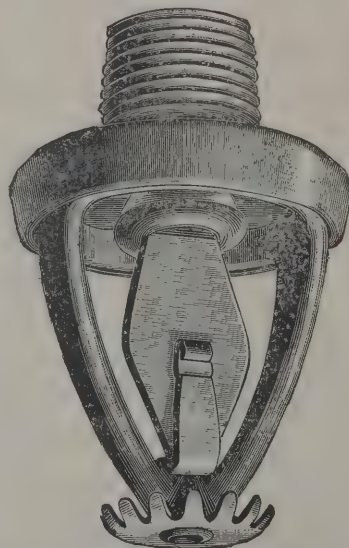
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ments, associations, bodies, or persons," to procure surveys and make soundings under the bed of the Straits of Dover below low water mark, for the purpose of ascertaining and determining the practicability of making, and maintaining a bridge or viaduct over the English Channel as a means of communication by steam locomotion or otherwise between England and France. The Bill contains no clauses to enable the company to raise any money to carry out these experimental works, but power is sought in the most general terms to enable the company to enter into agreements with the South-Eastern and London, Chatham and Dover Railway Companies, with the Dover Harbour Board, "or any other companies, Governments, associations, or bodies."

BUILDINGS IN BIRMINGHAM, &c., IN 1892.

MR. F. W. LLOYD, the Birmingham City Building Surveyor, has furnished the following return of new buildings, &c., for which plans were approved during the year ended December 31, 1892, together with a summary of the three previous years :—

	1892.	1891.	1890.	1889.
Houses and shops	1,491	966	1,061	938
Business premises	22	36	65	18
Manufactories, warehouses and shopping	199	183	179	163
Churches	1	0	0	2
Chapels	2	0	2	0
Schools	1	3	3	3
Miscellaneous	230	214	185	211
Alterations and additions	205	139	213	195
	2,151	1,541	1,708	1,530

It will be seen that, with the exception of business premises, under which head are included large retail establishments, hotels, &c., there is a steady increase all round ; the dwelling-houses and shops being over 500 more than the same item in 1891, and include two additional blocks of artisans' dwellings built by the Corporation in Lawrence Street. There is only one church, viz. Church of England, St. Oswald's Road, Small Heath. The chapels are :—Friends' Meeting House, St. James's Road and George Road, and a Mission Chapel in

Kelynge Street. The one school is St. Mary's Roman Catholic, Lonsdale Road, Harborne. Amongst the miscellaneous are Church of England Mission Hall, Park Road, Harborne ; New Free Library, Small Heath ; Assembly Rooms, Stratford Road ; Midland Railway Offices, Suffolk Street ; Kyrle Society's Hall, Sheep Street ; Dogs' Home, Fazeley Street ; and new Police Offices, Corporation Street. The alterations and additions include additional class-rooms and new cookery and laundry school, St. Thomas's Church, Bath Row ; enlargement of Congregational Chapel, Francis Road ; additional chancel, &c., St. Catherine's Roman Catholic Church, Horse Fair ; extension of Mason College, Edmund Street ; extension of Volunteer Drill Hall, Thorpe Street ; and alterations and additions to Dental Hospital, Newhall Street. From the above return it would appear that the past year has been one of much activity with all branches of the building trades in the city, especially if the prolonged strike of bricklayers and bricklayers' labourers in the early part of the year is taken into consideration. During the year 935 notices have been forwarded to property-owners and others as to dangerous buildings, projecting signs, emblems, &c. ; and a quantity of land, amounting to 144 superficial yards, has been conceded to the Corporation by owners of property setting back projecting windows, steps and other projections. During the same period 275 factories have been examined in accordance with the provisions of the Factory and Workshop Act, 1891, as to the means of egress for the employes in the case of fire. Of these 174 have since been altered, and are now provided with satisfactory means of egress, and the necessary alterations are at present in progress at forty-eight other factories.

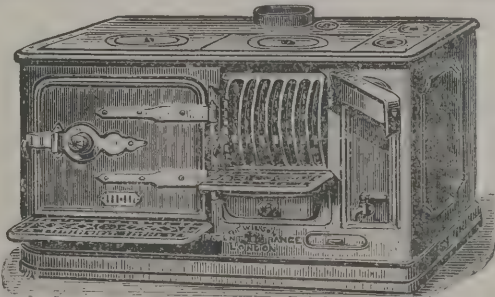
The Bolton Chronicle says :—Whatever fluctuations characterise the industrial career of this town and the surrounding district during the period between one Christmastide and its successor, one feature is always prominent—the development of building operations. Including the completion of undertakings previously commenced, and the work still on hand by Boltonian architects and builders, the record of structural extensions and renovations during the past twelve months forms a big total, their great variety being also something to be noticed. We have had enlargements of cotton mills and manufactories, the erection of new Board schools, and the renovation of other educational institutions, the construction of buildings for commercial, trading, religious and many other purposes which the enterprise or the ingenuity of this progressive age suggests. Annexed details furnished by the respec-

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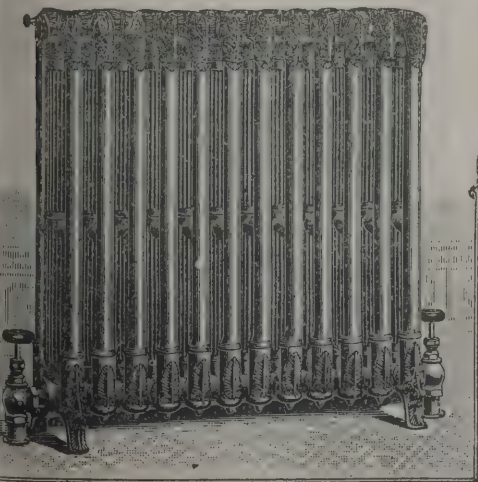
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tive architects and builders show to a great extent the progress made with regard to building undertakings in Bolton and the surrounding locality during the year.

THE EMPLOYERS' LIABILITY ACT IN SCOTLAND.

A CASE was heard last week in the Court of Session, Edinburgh, which exemplifies the contradictory evidence which is becoming common in cases under the Employers' Liability Act. The plaintiff was employed by Messrs. Henderson & Pollock, who in last March were carrying out the contract for the Water of Leith purification scheme. The plaintiff stated that he was assisting at the handles of a crane lowering pipes from the road under the Dean Bridge to the bed of the river, and when one of the pipes was being lowered over the embankment the jib of the crane gave a sudden and violent jerk, in consequence of which a part of the socket of the sole of the crane, in which the pivot worked, was wrenched up and broken, and the lower strap which fastened the westmost crane stays to the ground snapped, and the crane fell down. In consequence of the fall of the crane he was knocked over the embankment and fell into the bed of the river, a distance of about 30 feet, sustaining severe injuries. The accident was attributed to the crane being unfit and insufficient for the purposes to which it was applied. The contractors maintained that the crane was in all respects well fitted for the work, and that the accident arose from a latent defect in the strap, for which they were not responsible.

The Lord Justice-Clerk said it was a case in which the evidence upon the one side and the other presented perhaps as extraordinary contrasts as had ever been seen in a jury Court. For example, this crane was said to have been working regularly for four or five weeks before the accident. On the other hand, some witnesses stated that it was only working for two days, and only now and again, to raise and lower the pipes. Then they were told by people who were working the crane that they never saw Sturrock the manager oiling it. On the other hand, Sturrock said that he oiled it every day. They were told that it was never inspected during all the time it was there, and Sturrock told them that he inspected it every day as part of his duty, while it was also part of the evidence for the defence that if a crane of this kind was inspected when it was put up, it did not require to be examined for other twelve months. Some witnesses said that the crane worked stiffly and with jerks; others said that there was no stiffness, and that it never jerked

at all. Some witnesses said that the accident happened when the crane was being slewed round; others said that the slewing was finished, and that it came down when in the act of lowering the pipe down to its bed. Some of the witnesses said that at the time it came down there was a very sudden jerk, one of them saying he was thrown against the wall, while Sturrock, who was present, said that it came down "quite canny." Then, when they came to an examination of the crane, some witnesses said that there was a distinct crack in the sole-plate, which, it was evident, had been there before the accident, because it was not fresh; others said that they examined it with care, and that there was no such crack after the accident, and that all the break there was was absolutely fresh; while the manager told them that he had made a chip in it some time before, and that that chip must have been there at the time the accident took place. The chip had not, perhaps, weakened the crane, but it was visible, whilst many of the witnesses said that they saw no such thing. Lastly, as regards the strap, they were told by people who examined it immediately after the accident that they saw an old crack in it, red with rust, coming to the outside. Other witnesses told them that there was no crack coming to the outside, that there was no rust, but that there was inside, where it could not be seen, a flaw which some of them said was shown by a black mark. Others said it was shown by a mark which looked like red sand. So from beginning to end there was in this case the most absolute contradiction and conflict between the witnesses on both sides, and, therefore, it was a case in which the jury would have to do their best to get at what was a true and reasonable result. It was entirely and essentially a jury question, in which there was no real question of law involved at all.

After an absence of a quarter of an hour, the jury returned with a verdict for the pursuer, and assessing the damages at 150*l*.

THE SARDINIAN CHAPEL, LONDON.

THE clergy of the old Roman Catholic Church of St. Anselm and St. Cecilia, Lincoln's Inn Fields, which for upwards of two centuries has been known as "The Sardinian Chapel," have, it is said, received formal notice from the County Council that the site of that building will be wanted for the purpose of forming the new street from Holborn to the Strand, and that it will have to be removed. The building itself is of some historical interest, inasmuch as it dates from the year 1648, when it was



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built in the rear of the mansion of the Sardinian Ambassador, which faced the south-western corner of Lincoln's Inn Fields. At that period, and for at least a century afterwards, the various ambassadors' chapels in London were the only places where the Roman Catholics of the metropolis could meet for their religious services, the erection of churches and chapels for that body being forbidden by law. Indeed, the use of the ambassadors' chapels by them was rather connived at than permitted. The chapel was partially wrecked by the mob in the Gordon Riots of 1780, but afterwards it was enlarged and to a great extent rebuilt. From that date down to about 1820, when St. Mary's, Moorfields, was built and opened, the Sardinian Chapel served as the headquarters of Roman Catholic worship and of the charities of that community, as it was near to the residence of the Bishop or Vicar Apostolic in Castle Street, Holborn, and also to the Freemasons' Tavern, where most of the public meetings were held for the agitation of "Roman Catholic Emancipation" in the early part of the present century. Erected under all sorts of difficulties, in a retired situation, and with a special view to the very reverse of display, the building has no sort of beauty or attractiveness, and many persons pass daily along Sardinia Street without even noticing that it is an ecclesiastical edifice. And yet down to the end of the reign of George III. it was the weekly resort of the Roman Catholic aristocracy on Sundays and holy-days of obligation, when the street in front of it was crowded by their carriages.

REGISTRATION OF PLUMBERS.

THE Lord Mayor presided at the quarterly Court of the Plumbers' Company at the Guildhall. A communication from the sub-committee of the Hornsey Divisional Committee of the Middlesex County Council on Technical Instruction was reported, stating that the County Council proposed to arrange for the holding of a class on plumbers' work at the Museum of Sanitary Appliances, established by the Hornsey Local Board at Highgate, and requesting the Plumbers' Company to nominate a teacher. The Court nominated Mr. Geo. Taylor, R.P.C., foreman to Messrs. Dent & Hellyer, as teacher. The Court also considered a communication from Professor W. R. Smith (director of the Laboratories of State Medicine), on behalf of the Governors of King's College, offering the use of workshops, lighted by electricity, and the physical and

chemical laboratories of the College for advanced technical instruction for plumbers in connection with the Company's educational scheme. On the motion of Sir Philip Magnus, a committee was appointed to prepare a scheme by which selected students from the metropolitan plumbing schools may have the opportunity of attending a course of advanced instruction at King's College. The Court also considered and approved a syllabus of technical lectures on sanitary plumbing, hot and cold water supply, and house drainage, to be delivered in connection with the Victoria University College, Liverpool, where classes for plumbers' apprentices are carried on under the direction of members of the United Operative Plumbers' Association of Great Britain and Ireland.

LIST OF REGISTERED PLUMBERS.

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FARRER, F. T., 17 Flood Street, Chelsea, S.W.

London Journeymen.

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PLUMRIDGE, W. C., 62 Wilcox Road, South Lambeth, S.W.

Provincial Masters.

ADKIN, J. W., Boston Spa, Yorks.
BALL, J. T., 44 Foregate Street, Chester.
HOLT, R., Overton, Ruabon, Denbigh.
SYKES, E., Bridge Road, Milnsbridge, Yorks.

Provincial Journeymen.

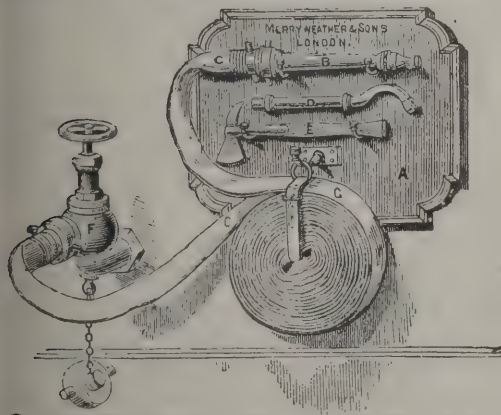
BAMBER, R. D., West Street, Alford, Lincolnshire.
COCKILL, A. H., 14 Coburg Street, Camp Road, Leeds.
DENNIS, G., 72 Chirkdale Street, Liverpool.
GOODBURN, R., 66 Rydal Street, Everton, Liverpool.
IRELAND, M., 6 Denne Road, Horsham.
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KENNEDY, J., 18 Cicely Street, Wavertree Road, Liverpool.
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PRIESTLEY, J. H., 60 Coronation Street, Blackpool.
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PSEUDO FIREPROOFING.

At the last monthly meeting of the Illinois Chapter of the American Institute of Architects, the results of the recent fire in the Chicago Athletic Club building were considered, and the information given is interesting as revealing the risks attending the use of detachable materials as a means of defence against flames.

Mr. Henry Ives Cobb, the architect of the building, said that perhaps the best way to bring the matter before the members was to briefly describe the structure, which is situated upon an inside lot with 80 feet frontage, 172 feet depth, and ten storeys in height, solid party walls on either side, and a front of blue Bedford limestone and brick. At the time of the fire the plastering was finished and the finishing well under way, and the contractors had used the gymnasium floor as a storage place for the hardwood lumber, some 70,000 feet being piled on this floor. In the storeys above was about the same amount of lumber that would be found in an ordinary fireproof building. The fire seemed to have started in the gymnasium and a number of other places at the same time. The woodwork in the upper floors was entirely consumed, but the fire did not go through the floors, but gained access through stairways and elevator shafts. In a general way the principal damage to the building was in the front, which is so far destroyed as to necessitate its rebuilding above the fourth storey. An interesting result was found in the fireproofing of the gymnasium floor where the fire was hottest. The first day the fireproofing was found to be in a generally good condition, but on following days the bottom member of the arches dropped off. It seemed to have lost its strength. The iron, where it was covered with fireproofing, was not damaged. The front of blue Bedford stone flew to pieces as soon as the water struck it. In the gymnasium, which was spanned by steel girders 40 feet long and 5 feet deep, special sections of the fireproofing dropped off the lower member, the tile breaking at the lower edge of the flange that held it to the girders, but these were not in any way damaged. The architect considered that the results proved that some system by which the tile could be tied in place by wire would be valuable. The fire was most intense in the gymnasium around the columns, where the fireproofing was destroyed, and in the dining-room where there was comparatively little fire the columns were in some cases left exposed. Above the gymnasium floor the building is changed in form to an I, the court walls being 15-inch, built in the ordinary steel

construction. These were more or less damaged. In the tennis court, which was lined with cement and contained steel columns, the cement was cracked, showing an expansion of the metal. In the front, where the 12-inch brick walls contained columns, no effect was noticed, showing that here the brick protected the columns. In the places where cement or lime was used the strength of both was killed. In the tennis court, where cement was used on the walls and laid with extraordinary care, being kept wet until the several courses were laid, it peeled off in courses. It was noticed that at the bottom of some columns where wire was used to secure the fireproofing, the material came off as in other places.

The water thrown on the material did serious damage, and it would have been better if the firemen had turned their attention to protecting the surrounding buildings and thrown no water into the building. While the fireproofing saved the building from being pulled to pieces by the expansion and contraction of the steel, it did not save itself, as shown by the disintegration and dropping of the bottom member under beams after the fire. It was probable that a large portion of the fireproofing would have to be renewed.

A member having asked Mr. Cobb if he would use the same system (terra cotta lumber) again, Mr. Cobb said he would, as he believed it to be as good as any fireproofing material, if not the best. It was a matter of regret that the several kinds of fireproofing were not used in the building, so that a comparative test might have been had. In the destruction of the fireproofing around columns, the speaker was of opinion that the water thrown on them penetrated to the air space behind the fireproofing (Z-bar columns were used), and formed gases which threw the protecting material off.

General Sooy-Smith said he went over the building very carefully the next morning after the fire. What struck him forcibly was that the heat was intense but of short duration, with the best possible draft at almost blow-pipe intensity. In the gymnasium the sections of fireproofing around the columns rested upon wooden blocks, which penetrated to the column. These were in some cases charred and in others completely burned out, and this may have caused the material to fall. One lesson taught is that fireproofing should be fireproof. They should select a fireproofing that in its manufacture is subjected to a heat more intense than any it can be subsequently subjected to in a building, and it is also necessary to devise a better method of securing it in place. The speaker endorsed Mr. Cobb's supposition that steam had generated behind the fire-

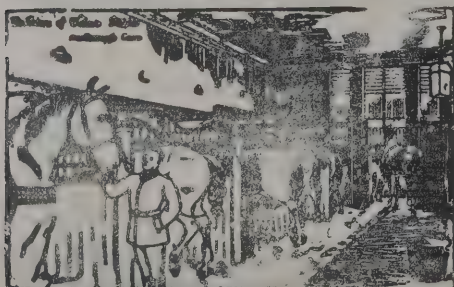
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proofing on columns, and stated that it was apparent that wooden bands in connection with fireproofing around columns were out of place, and that if the metal is thoroughly protected a permanent building can be constructed by ordinary methods. In mercantile buildings excessive care should be taken in fireproofing. Architects will have to come to the using material for columns that is in itself fireproof, and he suggested this as a very interesting and profitable line of research, and that at least it will bring about a better system of fireproofing columns than that now employed. In regard to the stone used, while it was probable that no stone would resist fire and water, still some was much better than others. The speaker spent three days after the great fire in studying the effects of fire on stone, and the best stone he found was artificial stone. In one place he found this combined with limestone and sandstone. The limestone was totally destroyed, the sandstone was cracked, while the artificial stone was not much damaged. In fireproofing, what was needed was a system that would resist fire and still retain its stability. Columns must be homogeneous, or steam will form and throw off the fireproofing.

AN AMERICAN MONOLITH.

A GREAT brown-stone monolith will be among Wisconsin's contributions to the World's Fair. This obelisk claims the title of being the largest on earth. The work was commenced with five steam channellers and about forty men in August last, since which time the work has been pushed until the large pillar was worked out. Previous to the day of raising, the workmen at the quarry had carefully started the parting wedges, so that on the appointed day all that was necessary to complete the task Mr. Prentice had undertaken was the successful driving of the wedges. Along each side of the monolith, which had been sawed at either end, were about four hundred leather wedges, all partly driven. Arriving at the quarry, all that remained to be done was the giving of the signal to begin driving the wedges. There were fifty men on either side standing with mauls uplifted, waiting for the word to be given to tap the entered wedges. At a signal the mauls fell, and the work had begun. With the precision of clockwork the men drove the wedges, at each succeeding blow advancing to the next wedge. At last, with a slight quiver, the huge rock parted in its entirety from the mass and lay at the bottom of the pit ready to be delivered to the State Commission, to be trimmed

to the desired size. Mr. Prentice's first proposition to furnish the monolith was for a stone just a trifle larger than the Egyptian obelisk at Rome, said to be the largest in the world, which is 105 feet 7 inches, exclusive of the foundation, and 9 feet square at the base. He first intended the monolith to be 106 feet in length and 9 feet 2 inches at the base, but upon a later consideration decided to have it 115 feet long, 10 feet at the base and 4 feet square at the top. The apex will be about 5 feet long, and will be tapered to about a 6-inch tip. The entire monolith will rest upon a foundation of granite 10 feet high and 12 feet square.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

22772. Joseph Jones and John Rawson, for "A window sash-fastener and rattling preventer."

22850. James Price, William Henry Price, and Edwin John Price, for "Improvements in cocks and valves."

22895. Walter Brierley, for "Improvements in locks."

22924. The Co-operative Padlock Society, for "Improvements connected with the insertion of keys within locks and latches."

22979. James Moran, for "An improved automatic fire-escape."

22988. David Baron, for "A combined inlet and outlet ventilator."

23026. George Clarke, for "Improvements in stays for casements, fanlights and skylights, and for other like hinged articles."

23056. Thomas McKenzie, for "Improvements in chimney cowlings."

23111. Charles Darrah (of the firm of Baxendale & Co.), for "Improvements in hinges."

23175. "An improved device for mounting swinging mirrors, sash-frames, ventilators, and the like."

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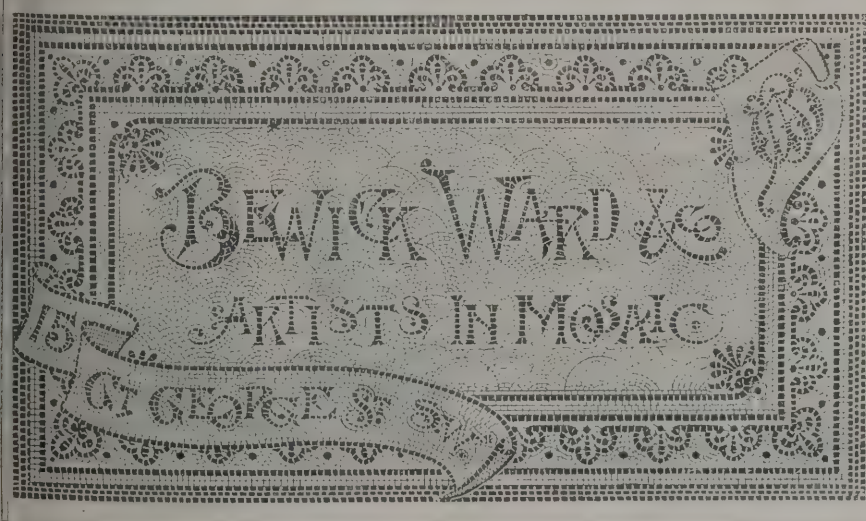
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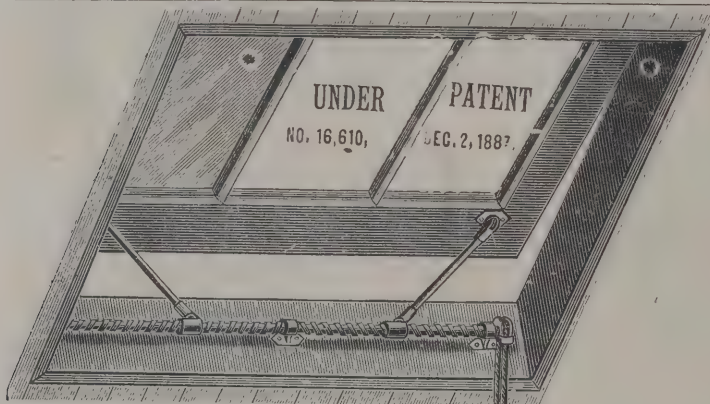
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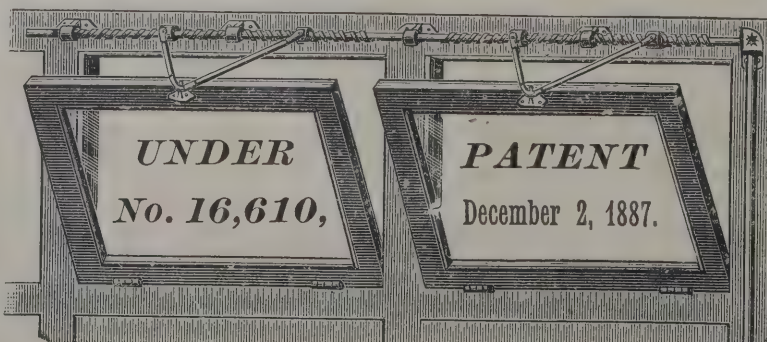
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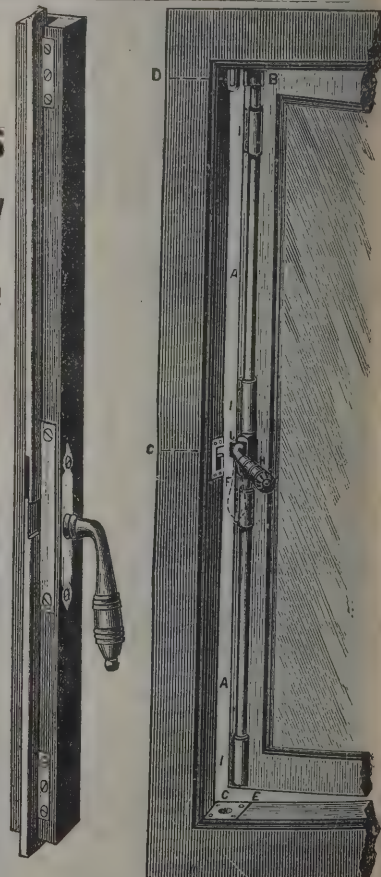
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COMPETITIONS OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200*l.*, 150*l.* and 100*l.* Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

PLYMOUTH.—Plans, Sections, &c., are Invited for Housing Working Classes. Premiums of 50*l.*, 25*l.* and 15*l.* Mr. J. H. Ellis, Town Clerk, Municipal Buildings, Plymouth.

WAKEFIELD.—Feb. 1.—Designs are invited for the Erection of Council Chamber, Committee Rooms and Offices. Mr. F. Alvey Darwin, Clerk of the Peace, West Riding Offices, Wakefield. Premiums of 200*l.*, 100*l.* and 50*l.*

WINSFORD.—Feb. 13.—Designs, Estimates, &c., are Invited for Proposed Technical Schools and Gymnasiums. Premiums of 50*l.*, 15*l.* and 10*l.* Mr. J. Cowley, Secretary, 38 Witton Street, Northwich.

CONTRACTS OPEN.

ACCRINGTON.—Jan. 18.—For Extension of the Globe Works. Mr. Henry Ross, Architect, Birch Street, Accrington.

AMLWCH.—Jan. 29.—For Building Semi-detached Villa Residences, Construction of Roads, Drains, &c., Bull Bay. Mr. Robert Grierson, Architect, Bangor.

ASHTON-UNDER-LYNE.—Jan. 17.—For Repewing, &c., Wesleyan Chapel. Messrs. T. George & Son, Architects, Old Square, Ashton-under-Lyne.

BARKING.—Jan. 24.—For Building Public Offices and Public Library, Fire Station, Mortuary, Stabling, Cart Shedding, and Cottage. Mr. C. J. Dawson, Architect, East Street, Barking.

BATLEY.—Jan. 16.—For Building Four Houses, Out-buildings and Boundary Wall. Mr. J. H. Brearley, Architect, Commercial Street, Batley.

BELFAST.—Jan. 24.—For Building Goods Store, 300 feet by 120 feet, at Terminus. Mr. John Milliken, Secretary, Belfast.

BOGNOR.—Jan. 13.—For Pulling Down and Rebuilding Bridges. Mr. Charles Adcock, County Surveyor, 5 Queen's Square, Bognor.

BRIERLEY HILL.—Jan. 18.—For Building Crown Post Office. Mr. H. W. Primrose, Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

BURNLEY.—Jan. 18.—For Painting and Decorating Interior of Town Hall. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

BURNLEY.—Feb. 8.—For Plumbing, Glazing, Painting and Hot-water Apparatus, for New Workhouse Infirmary. Mr. S. Keighley, Architect, Nicholas Street, Burnley.

BURTON-ON-TRENT.—For Building Liberal Club. Messrs. D. Brown & A. J. Gordon, Architects, 3 Whitehall Avenue, S.W.

CARLTON.—Jan. 17.—For Constructing Culvert and Concrete Work for the Local Board. Mr. J. K. Clark, Clerk, Board Room, Carlton.

CATERHAM.—Jan. 13.—For additions to Water Storage and other Work at the Asylum for Imbeciles. The Metropolitan Asylum Board, Norfolk House, Norfolk Street, Strand, W.C.

COLCHESTER.—For Building Public Library. Mr. Brightwen Binyon, Architect, Ipswich.

CORNWALL.—Jan. 25.—For Restoring St. Keverne Church. Mr. Edmund Sedding, Architect, 7 Buckland Terrace, Plymouth.

DEPTFORD.—Jan. 18.—For Construction of Underground Urinal. Mr. J. Spencer, Clerk, 141 Greenwich Road, Greenwich.

DUMFRIES.—Jan. 31.—For Mason and Ironwork for Bridge at Drumpark. Mr. J. Symons, Writer, Dumfries.

DUNDALK.—Jan. 30.—For Building Offices, Waiting-rooms, Refreshment-rooms, &c., at New Station. Mr. W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin.

ELLAND.—Jan. 26.—For Building Fire Brigade Station and Sanitary Depot. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

FOLESHILL.—Jan. 31.—For Building Senior Boys' School. Messrs. G. & J. Steane, Architects, 22 Little Park Street, Coventry.

FOWEY.—Jan. 14.—For Building Wesleyan Church and School. Mr. F. C. Jury, Architect, St. Austell.

FRECKLETON.—Jan. 14.—For Building Four Semi-detached Cottages at Grange Farm. The Borough Engineer, 16 Church Street, Preston.

GLASGOW.—Jan. 14.—For Construction of Additional Aqueduct from Loch Katrine (3 miles). Mr. Gale, Engineer to the Water Commissioners, 45 John Street, Glasgow.

GOLDEN LANE.—Jan. 13.—For Works of Repair Painting, Cleaning, &c., at Warehouse, known as Manchester Buildings, for the Vestry of St. Luke. The Surveyor to the Vestry, Vestry Hall, City Road, E.C.

GRAVESEND.—Jan. 16.—For Building Board School. Mr. Geo. C. Hammond, 23 Harmer Street, Gravesend.

GWAELODYGARTH.—Jan. 31.—For Building Master's House. Mr. R. Y. Evans, Guildhall Chambers, Cardiff.

HIPPERHOLME.—Jan. 14.—For Alterations and Additions to the Hare and Hounds Inn. Mr. Raymond Berry, Architect, Arcade Chambers, Halifax.

LEEDS.—Jan. 14.—For Extension and Completion of Menston Asylum. Mr. J. Vickers Edwards, County Surveyor, Wakefield.

LEEDS.—Jan. 25.—For Building Fifty Houses. Mr. Wm. Bell, Architect, North-Eastern Railway, York.

LLANDAFF.—Jan. 23.—For Building Master's House and Cottage, for Cathedral School. Messrs. Halliday & Anderson, Architects, 19 Duke Street, Cardiff.

LONGFORD.—Jan. 21.—For Building Post Office and Residence. Mr. J. H. Roynan, Architect, Nenagh.

LUTON.—Jan. 24.—For Alterations and Repairs to Premises and Town Hall. Mr. T. R. Roscoe, Borough Surveyor.

LYNDHURST.—Jan. 23.—For Construction of Two Small Powder Magazines, Concrete Vault, Machine House, &c. Messrs. Lemon & Blizard, Engineers, Lansdowne House, Castle Lane, Southampton.

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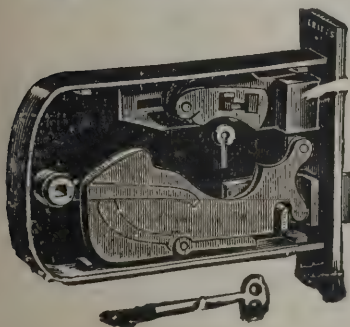
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MILLOM.—Jan. 30.—For Building Board School for Girls and Alterations to School. Mr. W. T. Lawrence, Milloom.

NEW BROUGHTON.—Jan. 21.—For Building Wesleyan Chapel. Mr. Robert Williams, New Broughton, Wrexham.

NEWTON-UPON-OUSE.—Jan. 13.—For Restoration of Bridge over the River Kyle. Mr. Octavius Robinson, Clerk to the Highway Board, Easingwold.

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OXFORD.—Feb. 7.—For Erection of Municipal Buildings. Mr. Henry T. Hare, Architect, 1 York Buildings, Adelphi, W.C.

PONTYPRIDD.—Jan. 14.—For Construction of Filter Beds, Service Tank, &c. Mr. Togarmar Rees, Engineer, Corn Exchange Chambers, Newport, Mon.

PRESTON.—Jan. 24.—For Building Grain Shed, 552 feet by 100 feet. Mr. Henry Hamer, Town Clerk.

ROCHDALE.—Jan. 19.—For Providing Five Slipper-baths for Second-class Department. The Borough Surveyor.

ROTHERHAM.—Jan. 14.—For Alterations to Shops in College Street. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

SHIPLEY.—Jan. 24.—For Building Two Houses. Mr. W. H. Beevers, Architect, 25 Bond Street, Leeds.

SMETHWICK.—Jan. 13.—For Construction of Brick and Pipe Sewers, &c. Messrs. Harris & Harris, Engineers, 9 Bennett's Hill, Birmingham.

STAINLAND.—Jan. 18.—For Building Warehouse and Offices at Dog Lane Mills. Messrs. C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.

ST. AGNES, REDRUTH.—Jan. 24.—For Building Coastguard Station. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

ST. GEORGE.—Jan. 23.—For Building Higher Grade and Technical School. Mr. F. Bligh Bond, Architect, 36 Corn Street, Bristol.

STRATFORD.—Feb. 14.—For Construction of Underground Urinal. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

TOTTENHAM.—For Building Block of Board Schools for 1,560 Children, Bruce Grove. Mr. G. E. T. Lawrence, Architect, 181 Queen Victoria Street, E.C.

WOMBWELL.—Jan. 13.—For Enlargement of Jump Board School. Mr. W. J. Sykes, Architect, Hoyland, near Barnsley.

TENDERS.

BRISTOL.

For Pulling-down Old and Erecting New Warehouses, Bristol. Mr. HERBERT J. JONES, Architect, Wellington Chambers, Bridge Street, Bristol. Quantities by Architect.
G. HUMPHREYS, Bristol (accepted) £4,609 0 0
Ten other tenders received.

BECKENHAM.

For Improvement Works, Beckenham. Mr. G. B. CARLTON, Surveyor.

Wickham Road.

Griffith & Co., Kingsland	£2,049 16 4
Woodham & Fry, Greenwich	1,646 17 3
Mayo & Co., Brixton	1,399 17 7
MOWLEM & Co., Westminster (accepted)	1,332 14 0
Surveyor's estimate	1,650 0 0

Sultan Street.

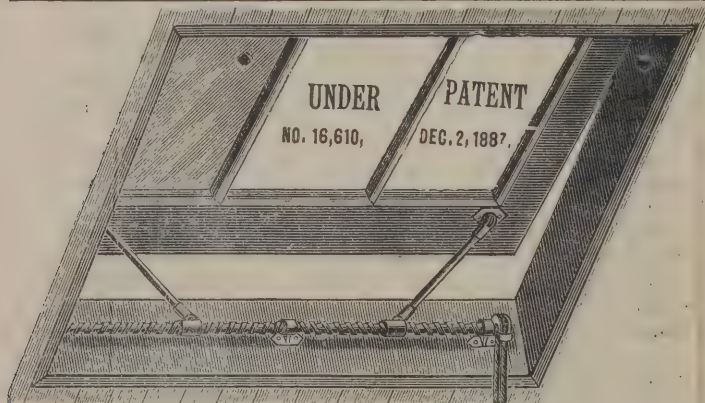
Griffith & Co.	508 6 11
Woodham & Fry	418 18 1
Mayo & Co.	372 9 1
Mowlem & Co.	337 16 6
Surveyor's estimate	333 19 9

Gwyddor Road.

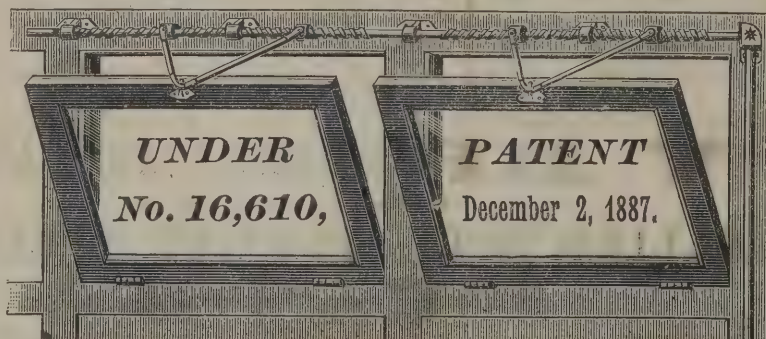
Griffith & Co.	756 9 4
Woodham & Fry	605 0 0
Mayo & Co.	519 18 0
MOWLEM & Co. (accepted)	499 15 0

Church Road.

Griffith & Co.	372 2 0
Woodham & Fry	277 2 10
Mayo & Co.	253 13 3
MOWLEM & Co. (accepted)	229 15 0
Surveyor's estimate	260 0 0



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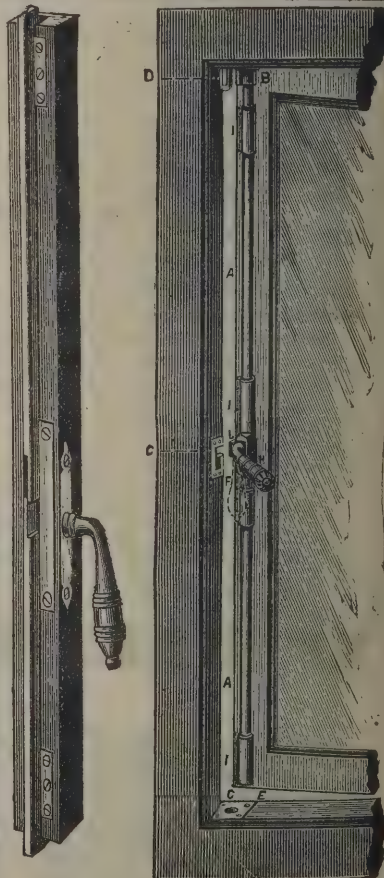
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Woodham & Fry	1,040	12	4
Mayo & Co.	855	1	9
MOWLEM & Co. (accepted)	797	0	0
Surveyor's estimate	857	10	0

Chancery Lane.

Griffith & Co.	318	0	0
Woodham & Fry	282	0	0
Mayo & Co.	245	13	4
MOWLEM & Co. (accepted)	235	0	0
Surveyor's estimate	235	0	0

GLOUCESTER.

For Alterations and Additions to Wellington Hotel, Gloucester, for Mr. Henry R. J. Braine. Mr. EDWIN NIBLETT, Architect, Gloucester. Quantities not supplied.

W. Jones, Gloucester	£1,259	0	0
Claridge & Bloxham, Banbury	1,232	0	0
GURNEY BROS., Gloucester (accepted)	1,137	0	0

HUCKNALL TORKARD.

For Additions to Dwelling-house at the Waterworks, Salterford, for the Hucknall Torkard Local Board. Mr. WILLIAM SWANN, Architect.

J. Dove, Hucknall Torkard	£120	0	0
J. & R. Stainforth, Hucknall Torkard	95	0	0
Jas. Whyatt, Hucknall Torkard	87	10	0
Levi Green, Hucknall Torkard	78	10	0
R. S. WEBSTER, Hucknall Torkard (accepted)	75	0	0

LONDON.

For Erection of Buildings in Chancery Lane. Mr. ST. PIERRE HARRIS, Architect, 1 Basinghall Street. Quantities by Messrs. C. STANGER & SONS, 21 Finsbury Pavement.

Jaques (<i>too late</i>)	£5,601	0	0
Ringdon	5,507	0	0
Higgs & Hill	5,457	0	0
Lawrance & Sons	4,500	0	0
Longmire & Co.	4,330	0	0
Holloway Bros.	4,310	0	0
Colls & Sons	4,122	0	0
Gregory & Co.	3,977	0	0
BUSH & SONS (accepted)	3,975	0	0

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For Hot-Water Warming and Supply Apparatus, at the Western Hospital, Fulham, for the Managers of the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

W. Briggs	£1,950	0	0
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Perkins & Son	675	0	0
Strode & Co.	670	0	0
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Potter & Son	659	0	0
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W. Brown	535	0	0
Benham & Sons	510	0	0
Wenham & Waters	497	0	0
London and Birmingham Manufacturing Company	494	0	0
J. & F. May	490	0	0
CLEMENTS, JEAKES & Co. (accepted)	370	0	0

For Extension of Boiler House, St. Luke's Workhouse, City Road, for the Guardians of the Holborn Union. Mr. H. SAXON SNELL, Architect. Quantities supplied.

Dove Bros.	£865	0	0
W. Bamford	775	0	0
Flew & Co.	715	0	0
C. Dearing & Son	689	0	0
J. O. RICHARDSON (accepted)	629	0	0
H. Wall & Co.	609	0	0

For Alterations to 74 High Street, Lewisham. Mr. ALBERT GUY, Architect.

Kennard Bros.	£374	0	0
Rosenberg	355	5	0
Courtney & Fairburn	345	0	0
Pritchard & Renwick	308	0	0
J. O. RICHARDSON (accepted)	284	0	0

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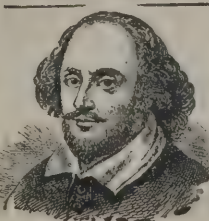
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J. B. POTTER (accepted)	439	0	0
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W. H. Lascelles & Co.	£313	0	0
Tufts & Wood	290	11	6
J. ELLINGHAM, Bexley Heath (accepted)	250	13	0

For Works at the Salutation, Newgate Street, for Mr. C. Todd-Pullen. Messrs. DICKENSON & PATERSON, Architects, 5 John Street.

Builders' Work.

HOLLINGSWORTH, Peckham (accepted).

Gasfittings.

VAUGHAN & BROWN (accepted).

NORTHALLERTON.

For Constructing Outfall Sewer, &c., for the Northallerton Local Board. Mr. D. BALFOUR, Engineer, 3 St. Nicholas Buildings, Newcastle-on-Tyne.

H. Fleming, Redcar	£675	10	8
G. Allison, Sunderland	625	0	0
W. Blooman, Whitby	543	17	0
J. L. Hampton, Harrogate	444	12	0
R. Hudson, jun., Sunderland	400	0	0
T. Dixon, Houghton-le-Spring	396	0	0
J. Carrick, Durham	379	11	0
J. GOLDSBOROUGH, Chester-le-Street (accepted)	325	18	0
Engineer's estimate	340	0	0

ORPINGTON.

or Additions and Repairs to Falkland Lodge, Orpington. Mr. ST. PIERRE HARRIS, Architect, 1 Basinghall Street, and Orpington.

Somerford & Son	£134	0	0
Stebbing & Pannett	120	0	0
Osborne & Co.	97	10	0

PORCHESTER.

For Alterations and Additions to Board School, Porchester. Mr. WM. YEARDYE, Architect, Town Hall, Fareham.

C. Harding, Southsea	£937	0	0
T. & P. Hall, Southsea	918	0	0
G. H. & A. Blackman, Fareham	820	0	0
G. Stallard, Havant	790	0	0
J. Crockerell, Landport	765	0	0
J. PLUMMER, Fareham (accepted)	748	0	0
J. W. Perkins, Southsea	730	0	0
G. R. Holdaway, Fareham	643	0	0

ROCHESTER.

For Fittings for Science School in New Municipal Buildings, Rochester. Mr. F. T. W. GOLDSMITH and Mr. E. J. GOSLING, Joint Architects.

Geo. M. Hammer & Co., Strand	£298	0	0
D'Oyley's Joinery Works, Lim., Oxford Street	275	0	0
North of England School Furnishing Company, Lim., Newgate Street	255	10	0

STOKE.

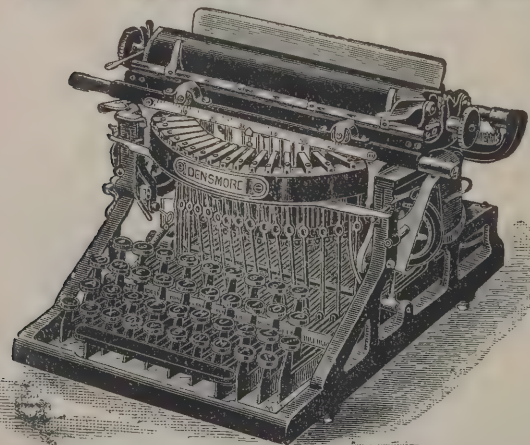
For Building and Finishing a Residence in the Parish of Stoke-next-Guildford, in the County of Surrey, Exclusive of Stoves and Chimney-pieces, for Mr. Charles James Scott. Mr. ROBERT CLAMP, A.R.I.B.A., Architect, Woking.

Quantities supplied:			
Colls & Co., Dorking	£3,005	0	0
Rider & Son, London	2,988	0	0
P. C. May, Guildford	2,947	0	0
Harris & Son, Woking	2,895	0	0
Mitchell Bros., Shalford	2,750	0	0
Wheatley & Son, East Molesey	2,512	0	0
R. PINK, Godalming (accepted)	2,437	0	0

WESTON-SUPER-MARE.

For Building Three Houses, Beach Road, Weston-super-Mare. Mr. W. J. SPENCER, Architect, James's Street, Weston-super-Mare. Quantities not supplied.

T. Palmer, Weston-super-Mare	£1,883	0	0
J. Palmer, Weston-super-Mare	1,845	0	0
W. M. Dubin, Weston-super-Mare	1,750	0	0
C. Addicott, Weston-super-Mare	1,700	0	0
J. Hando, Weston-super-Mare	1,640	0	0
C. Taylor, Weston-super-Mare	1,573	0	0
A. J. Dorey, Weston-super-Mare	1,539	0	0
T. ALLEN, Weston-super-Mare (accepted)	1,500	0	0

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WANSTEAD.

For Erection of Trumpington Road Schools, for the Wanstead School Board. Mr. John T. BRESSEY, Architect, 70 & 71 Bishopsgate Street Within.			
E. Houghton & Son, Stroud Green	£15,415	0	0
W. Gregar & Son, Stratford	13,924	0	0
W. J. Maddison, Canning Town	13,730	0	0
C. Norman Phillips, London	13,497	0	0
Harris & Wardrop, Limehouse	13,497	0	0
W. Watson, Ilford	13,300	0	0
S. J. Scott, London	13,237	0	0
A. Reed & Son, Stratford	12,876	0	0
J. Catley, Wanstead	12,159	0	0
De Vere Buckingham & Co., Basingstoke	11,050	10	0

WICK (SCOTLAND).

For Supplying, Laying, &c., 5,710 Lineal Yards of Fireclay and Cast-iron Pipes, Varying from 6 Inches to 20 Inches in Diameter, including Cutting and Refilling Tracks for same, and Works in Connection with the Extension of the Drainage of the Burgh. Messrs. GORDON & MACBEY, Engineers, Elgin and Inverness.

J. Shaw, Leith	£3,106	18	0
R. C. Brebner, Edinburgh	3,036	6	1
W. G. Flett, Glasgow	2,965	2	6
L. & W. Macdonald, Inverkeithing	2,847	9	7
R. Fraser, Inverness	2,586	6	0
T. Munro, Pulteneytown	2,558	10	2
Tait & Reid, Wick	2,375	9	0

WORKSOP MANOR.

For Additions to Worksop Manor, Notts, for Mr. John Robinson. Mr. W. H. HIGGINBOTTOM, Architect, 5 King John's Chambers, Nottingham. Quantities by Architect.

Geo. Sadler, Nottingham	£718	0	0
E. Kent, Nottingham	712	14	0
J. Shaw, Nottingham	663	5	0
H. Vickers, Nottingham	660	0	0
J. F. Price, Nottingham	643	0	0
J. Hutchinson, Nottingham	565	0	0
Fish & Son, Nottingham	564	0	0
ILETT & SON, Worksop (accepted)	550	0	0

WIMBLEDON.

For Improvement Works, for the Wimbledon Local Board.

Alexandra Road.

S. Atkins, Kingston-on-Thames	£1,450	0	0
Woodham, Fry & Fry, Greenwich	1,398	0	0
J. Mowlem & Co., Westminster	1,388	0	0
E. ILES, Wimbledon (accepted)	1,234	0	0

Latimer Road.

J. Mowlem & Co.	552	0	0
Woodham, Fry & Fry	520	0	0
E. ILES (accepted)	434	0	0

Queen's Road.

J. Mowlem & Co.	331	0	0
Woodham, Fry & Fry	319	0	0
E. ILES (accepted)	279	0	0

CHICAGO EXHIBITION NOTES.

THE American flag now floats from the Administration building at Jackson Park, to signify that the World's Fair buildings and grounds are in the possession of the United States Government.

ALL of the World's Fair offices, except two or three, are now removed to Jackson Park, and those will soon follow. For nearly two years the offices have been in the Rand-McNally building in the centre of the city. Now, however, the work of preparation of the great Fair has reached a stage requiring it to be carried on in the buildings which are to contain the exhibits. All of these buildings are now practically finished and ready for the installation of exhibits. Most of the work remaining to be done on the buildings is of a decorative nature and can be carried on and completed without interfering with the placing of exhibits.

In the Administration building, with Director-General Davis, are the offices of the departments of Foreign Affairs and Publicity and Promotion. The chiefs of the various exhibit departments—agriculture, electricity, mines, transportation, &c.—have their offices respectively in the great department buildings.

"SPHINX" PORTLAND CEMENT



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 14 inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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ESTABLISHED 1844. NATURAL PORTLAND AND ROMAN CEMENTS, HYDRAULIC BLUE LIME, Plaster of Paris, Keene's and Parian Cements, Bricks, Roofing Tiles, Drain Pipes, Paving Tiles, Bath Bricks, &c. Railway and water communication.

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PATENT
ASPHALTE
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FELT ROOFING.

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White Silica Paving.

SEYSSSEL ASPHALTE.

MARBLE WORK.

EMLEY & SONS, Lim^d.

Steam Sawing, Moulding, Turning, and Polishing Works,

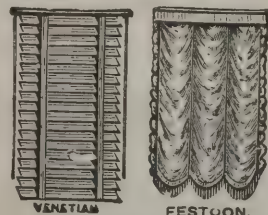
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Nails, Stoves, Kitcheners, and Open Fire Ranges,

Rainwater Goods, Sash Weights, Furnace Pans, Locks, Hinges, Pulleys, Bolts, Sash Fasteners, AND EVERY DESCRIPTION OF BUILDERS' IRONMONGERY.

THE
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Town and Country Houses, Mansions, Castles, &c., fitted to the very best advantage in every case.

Established over a Quarter of a Century.

G. A. WILLIAMS & SON,

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BAYSWATER, W.

THE "INFANT" DYNAMO.

ARCHITECTS are invited to SPECIFY it for small Electric Lighting Plants.

ADVANTAGES.—The framework is cast in one solid piece. The Armature can be taken out in a few seconds. There are no loose wires dangling from the brush-holders. The "Infant" Dynamo attains the high efficiency of 94 per cent. Full particulars and prices on application.

H. AUSTIN, Florence Works, Armley, LEEDS.

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THE installation of exhibits has already begun, but has not yet progressed far. Soon, however, the interior of each one of the buildings will be the scene of great activity. The authorities are determined to have all exhibits in place at the opening of the Fair, and manifestly this cannot be accomplished if exhibitors are allowed to be dilatory. It will not do to permit the great mass of exhibitors to defer installing their exhibits until April, and accordingly State and foreign commissions and individual exhibitors will be required to be prompt. Exhibitors who are dilatory beyond a certain point will lose their space and be barred out.

THE requirements of the preparation of the official catalogue of exhibits also necessitate promptness on the part of exhibitors. This catalogue will be an elaborate publication, and, generally speaking, will have a separate volume devoted to each department. It is the determination to have it on sale in complete condition on the opening day of the Fair, if it is possible to do so. That will, of course, depend mainly on the promptness of exhibitors.

UNDER the east windows of the occupied wing of the Administration building lies a scene like a creation of the Arabian Nights. It is the grand court, the main gateway to the World's Fair, the feature *par excellence* of the entire perfect plan of the Exhibition.

IN the centre ripples the blue waters of the great basin, which, while constantly renewed by Lake Michigan, is yet sheltered from the giant waves foaming on the open shore. The sky line on the east side—where the grey-blue horizon melts indistinguishably into the greyer blue of the lake and basin—is broken by the imposing pillared colonnade and the magnificent central arch of the peristyle. At either end stands the Music Hall and the Casino, disappearing in the soft misty haze behind the stately corner pavilion of the Manufacturers' building on the north, and on the south partially hidden by the graceful front of the Agricultural building. Above the dome of the latter the famous figure of Diana pirouettes with the shifting wind. This statue, being of heroic proportions and brilliantly gilded, is dazzlingly conspicuous amidst the prevailing white and grey of the landscape. Here and there, too, along the ornate fronts of these ivory palaces are rich, warm frescoes in mellow reds and yellows, painted under the direction of Millet, the artistic magician of the World's Fair. At the east end of the great basin stands French's grand statue of the Republic, lifting her shapely length 60 feet

from the pedestal, towering 90 feet above the waters of Lake Michigan. Opposite and immediately in front of the Administration building is the celebrated McMonnies fountain fast approaching completion. Columbia sits enthroned in the barque of Progress, heralded by Fame, and rowed by the geniuses of civilisation, while Time, representing experience, keeps a firm steady hand on the tiller. It is a strikingly beautiful and particularly spirited conception, the wind from the lake seeming to rustle the snowy drapery of the forward bent figures at the oars.

To the right and left of this workmen are toiling and machines are whirring within two balustraded semicircles, building the electrical fountains. These will give the finishing-touch to the scene of enchantment by throwing over it the light that never was on land or sea. Over the great basin, with its giant statues and its encircling columns and palaces of ivory and gold, will play these cloud-touching fountains of myriad, ever varying hue, tinging them in turn with violet, rose, blue, green, crimson or the mingled tints of the most resplendent rainbow.

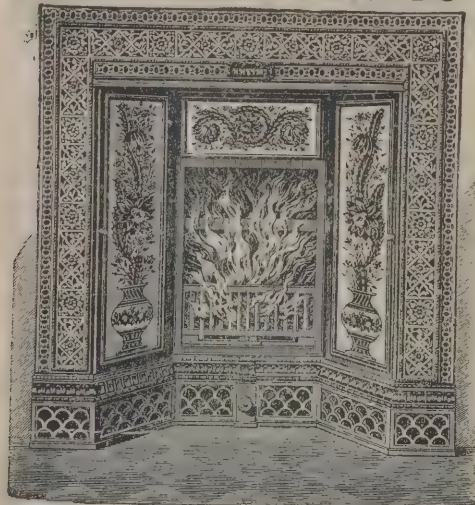
By the time the Fair opens Chicago will have living accommodation for not less than 300,000 strangers. Connected with the exhibition management is a Bureau of Public Comfort, through the agency of which many thousands of visitors can be directed to hotels, apartments, boarding-houses, furnished rooms, &c., where they will be comfortably cared for at moderate prices.

OHIO will erect a mineral cabin in the Mines building at the World's Fair to illustrate its mineral resources. The cabin will be 32 feet by 61 feet in dimensions and 23 feet high, and be constructed entirely of Ohio mineral products.

THE section from one of the big California redwood trees, which the Government will exhibit in its building at the World's Fair, has arrived at the Fair grounds. Eleven freight cars were required to convey it across the continent. It measures 30 feet long by 23 feet in diameter. The section is hollowed out, and when placed on end, divided into two storeys and lighted, as it will be, it will form a rustic house large enough for a family to live in.

THE educational exhibit at the World's Fair is to have the space it requires. A new building costing 120,000 dols. has been ordered for the ethnological exhibit, which accordingly is thereby removed from the Manufacturers and Liberal Arts building, thus allowing more space for the educational exhibit.

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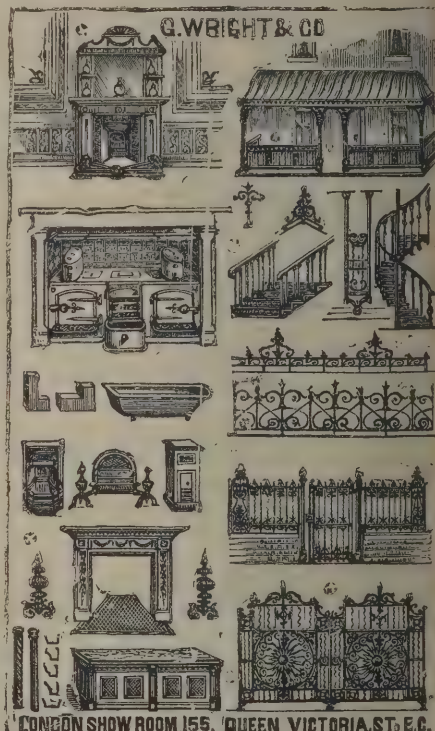
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"Burton Weir" Tile Panels and Hearths.

"THE GOLD MEDAL RANGE"
With Lifting Fire.

WORKS, ROTHERHAM. Estab. 1854.

BUILDING AND BUILDERS.

THE death is announced of Mr. W. White Phillips, builder, Hafod, well-known in the Rhondda. He was a member of the Llanwonno School Board, Pontypridd Local Board and Board of Guardians, and the Ystradfydwg and Pontypridd Joint Sewerage Boards.

AT the meeting of the Hamilton Dean of Guild Court proof was led in the petition by the Fiscal against Mr. John Tainsh, one of their number, for not carrying out the plans of alteration to his property as passed by the Court. When presented, the plans were, after being five times under consideration, dismissed, as Mr. Tainsh would not consent to remove part of the roof of his back yard for ventilation purposes. He then consented, and the plans were passed. Afterwards, he refused to remove the roof, stating that the Court, in so ordering him, had exceeded their powers. At the close of the evidence he was found guilty of a Guild offence, and ordained to carry out the alteration in conformity with the plans before March 1, and to pay 5s. of penalty and the expenses of the action. Mr. Tainsh intimated that he would suspend the judgment.

At the Board of Guardians meeting, Stratford-on-Avon, a letter was read from the Local Government Board on the proposed alterations at the workhouse. The Guardians had sent the plans as prepared by their architect, Mr. T. T. Allen, showing the provision of additional fire exits and various improvements in the sanitary arrangements of the casual wards, which were said to be in a "deplorable state." The Local Government Board returned the plans with a number of recommendations by their architect. The Board instructed Mr. Allen to amend the plans according to the suggestions made and submit them for final approval. Complaints were made of the great delay on the part of the Local Government Board in sanctioning the plans, the proposed work being of an urgent nature.

THE Dunfermline School contemplate building a technical school for about 350 students. Sketch plans have been prepared by Mr. Charles Tweedie, architect, Edinburgh, which provide for the use of the old Wilson School. The cost is estimated at about 4,500l.

THE subject of providing a new town hall came before the Workington Town Council, and it was resolved that the matter should be left to the Mayor's Committee to make all

necessary inquiries as to the probable cost of building a town hall, &c., and to report to a future meeting.

TRADE NOTES.

MESSRS. KEARNS have as usual produced their extensive series of diaries, which are specially prepared for the use of architects, contractors, &c. They are known to be so systematic that some day we may expect to hear the Courts recommend them for adoption in other classes of business, for anyone who will regularly utilise them to record his affairs cannot get into those difficulties which arise from unsystematic management. Messrs. Kearns do not, like many other publishers, depend on the external appearance of their diaries for success; they prefer to expend money on the inside, and paper and printing are as satisfactory as one can desire.

THOSE who have votes to bestow for the London Orphan Asylum, Watford, would do well to bestow their vote at this January election, which takes place on the 23rd inst., on T. C. Wilford, aged ten years, because on account of age it is the last opportunity for the boy. The father, a particularly respected and hardworking man, has left a wife and three children unprovided for, after two years of excessive suffering, during which he was entirely incapacitated for work. He served honourably under the Leicester Corporation, and was afterwards clerk of works to the London School Board, having been chosen out of some hundreds of applicants.

IN connection with Messrs. Archibald Smith & Stevens, we hear that one of their original pattern Smith's springs, which has been at work for thirty-five years on a City office door, was brought to them this week for repair. A comparatively slight renovation will start the veteran on a new course of service.

ON the 5th inst. Mr. Haden Tebb's sixth annual dinner took place at the Holborn Restaurant. Among those present were Mr. Haden Tebb (*père et fils*), Mr. T. H. Bolton, M.P., Mr. Everitt, Mr. Lewis, Mr. Harvey Prior, Mr. Slark, Mr. Horn, Mr. Rhodes, together with other representatives of the various professions.

A GULLEY-TRAP has lately been brought out by Mr. Couzens, of 14 Tudor Street, Cardiff, designed to prevent back-flow of tidal or storm-water, and also the escape of sewer-gas. The action is purely automatic, the ball abutting against the upper seating when water is in the trap, and falling on the

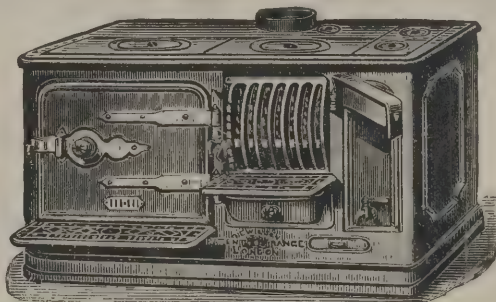
The "Wilson" Portable Cooking Ranges,

With Lifting Bottom Grate for Regulating Size of Fire.

JUST AWARDED THE GOLD MEDAL AT THE UNIVERSAL COOKERY EXHIBITION, PORTMAN ROOMS.

21 PRIZE MEDALS.

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THOS. E. NETTLE,

IMPORTER OF CANADIAN PINE DOORS AND MOULDINGS,

SASHES, DOORS, AND EVERY DESCRIPTION OF WOOD TURNERY, NEWELS, BALUSTERS, &c.

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BOARDS for PACKING CASES, and SMALL BOXES for CONFECTIONERS, &c., Cut to Order.

Timber Yard and Steam Saw Mills:—LUTON GROVE, WALTON ROAD, LIVERPOOL.

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FLOORING COMPANY.**

**PARQUET FLOORS.**

Materials Supplied or Laid Complete.

Price Lists and Samples on application.

Stanley Bridge Wharf,
537^A KING'S ROAD, CHELSEA.

lower when empty, thus closing the trap in either case. Mr. Couzens has also another trap for the same purpose, in which the ball is dispensed with and a plate is employed to close the aperture. Both these arrangements have been patented in England and other countries, and there is every reason to believe that they will prove successful, and that their introduction will be a great benefit, especially to dwellers in seaport towns, in which great annoyance is frequently caused by high tides during storms or otherwise.

AN inquiry has been held by the Local Government Board at the Leighton Corn Exchange with regard to the Local Board's application to borrow 20,000*l.* for the purpose of sewerage, sewage disposal and water supply. A comprehensive account of the scheme was furnished by the engineer, Mr. H. Bertram Nichols, C.E., of Birmingham, who in his evidence stated that the water would be stored in a tank on a tower 81 feet above the ground-level of the highest house in the town. The purification of the sewage is proposed to be on the international process, and the site of the outfall for the sewage works was from the main road, and so situated that it could never prove an eyesore. On the termination of the inquiry, the inspector, accompanied by the Chairman of the Board and Mr. Nichols, the engineer, visited the waterworks site and the site for sewage disposal works.

MR. JOHN GRUNDY, of 30 Duncan Terrace, London, N. and the Tyldesley Ironworks, is now engaged in warming the following Board Schools:—Tottenham new Board School, Rochester new Board School, Hove new Board School, Brighton new Board School, Cobholm Island Board School and Tullynessle Board School. Several Board Schools have recently been opened where Mr. Grundy's warm-air ventilating apparatus has been, we are informed, employed with great success.

At a meeting of the Mersey and Irwell Joint Committee just held it was resolved to proceed with the action against the Whitefield Local Board for polluting the river Irwell. A further extension of time in which to construct sewage works was granted to a number of local authorities.

THE Kingston-on-Thames Town Council have resolved to invite tenders for lighting the borough with electric light. Sanction has been given to the borrowing of 1,600*l.* for the purpose.

THE shareholders of the Highland Railway at a meeting in Inverness unanimously approved of a Bill for the extension of

the line from Stromeferry to Kyle, a distance of a little over ten miles, for which the Government have given a grant of 45,000*l.*

THE City Commission of Sewers have passed a resolution in favour of widening the thoroughfare in Cheapside between Newgate Street and St. Paul's Churchyard, and instructed a committee to prepare a plan and report on the probable cost of the improvement.

THE Baths Committee of the Liverpool Corporation recommend that the Pierhead baths should be reconstructed, the expenditure to be limited to 15,000*l.*

THE Baths and Wash-houses Committee of the Leeds Corporation have decided to erect two swimming and hot baths, the first in Lemon Street, and the second near the Viaducts, in Kirkstall Road. The committee intended to visit Bradford and Dewsbury to see the baths there before advertising for tenders.

THE Wrexham Rural Sanitary Authority have adopted a scheme for the drainage of Ruabon village, prepared by Mr. A. C. Baugh, architect, Wrexham, which is expected to cost slightly over 6,000*l.* Mr. Baugh has adopted the Shone ejector system.

VERY fine work has been executed from time to time by Mr. W. J. Barnikel, staircase, handrail and general joinery maker, of Fulham. The following may be mentioned out of many others:—Staircase and handrail work at Messrs. Rylands & Sons' warehouse, Wood Street, City; at Pentonville and Wandsworth Prisons; grand staircase, royal box, Kempton Park, specially for the visit of the Prince of Wales and the Shah of Persia; for the whole of the Egerton Gardens Estate, opposite the Oratory, Brompton Road, including oak staircase at Sir Michael Seymour's house and special staircase at No. 31; at Ivy Hatch, Kent, and Imperial Bank, Lothbury; including sixty-three large windows, doors and other work now in hand for the Stafford Infirmary, under Mr. Aston Webb, architect, and Mr. Pebworth, clerk of works; handrail work at large block of offices, Bishopsgate Street, and at Cloth Fair, E.C., for Messrs. W. Brass & Son, Old Street.

FOR the illustration of their calendar for 1893 Messrs. Spottiswoode & Co. have copied a painting by Mr. A. H. Tourrier, the *Argument*. It is a capital specimen of chromo-printing which is well worth preservation, for the effect of the old-fashioned costumes and details has been produced without any of the glaring discords too common in modern work of the time.

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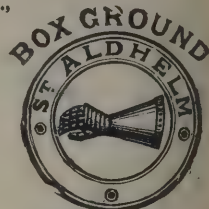
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"A WHITE LIE."

No ordinary success appears to have attended the first night's rendering of "A White Lie" at the Avenue Theatre on Saturday, the 7th inst., Mr. Kendal, manager; lessee, Mr. George Paget. "A White Lie" is an original comedy, in four acts, by Sydney Grundy, the characters being acted by Mr. Kendal, Mr. F. H. Macklin, Mr. Cecil M. York, Mr. G. P. Huntley, Mr. H. Deane, Miss Annie Irish, Miss Barbara Huntley, Miss Mary Clayton, Miss Empsie Bowman and Mrs. Kendal. New scenery has been painted by Mr. Harford, and the new fittings and furnishings, which are admirable, are the work of Messrs. Frank Giles & Co., of Kensington. Mr. and Mrs. Kendal, as it will be known, have only lately returned from America, where they achieved great success.

BRONZE STATUE OF THE QUEEN.

It will doubtless be of interest to the public to learn some details with reference to the bronze statue of Her Majesty, which is now placed in Whitehall for temporary exhibition, before being shipped for its final destination. The statue is the work of Signor Raggi, who received the order from the Hong Kong Jubilee Memorial Committee, it being determined by the principal inhabitants of that colony to mark their loyalty to Her Majesty and attachment to the mother country and fixed belief in the destiny of the British race, by placing an artistic memorial, in celebration of Her Majesty's jubilee, upon a prominent site in Hong Kong. Manifestly, nothing could be more appropriate than a statue representing Queen Victoria in her Imperial robes with the insignia of State. Designs were invited from a few artists of reputation, and from these Signor Raggi's was accepted as the best. It consists of a stone canopy, Renaissance style, about 75 feet high, under which the statue now on exhibition at Whitehall is to be placed, the stonework, which has been executed in England, having already been shipped to Hong Kong. It was, however, thought that so fine a work as the statue itself should not leave the country without giving the public an opportunity of judging of its merits. With this object in view, the Commissioner of Works, in conjunction with the Commissioner of Woods and Forests, have granted the temporary use of the corner of the vacant space where Carrington House once stood, thus offering a good opportunity to view this work of art.

The casting of this statue, which is of a most elaborate and

intricate nature, has been founded by the eminent firm of Messrs. H. Young & Co., Piccadilly, who also cast the colossal bronze sphinxes for Cleopatra's Needle, the Wellington Memorial in St. Paul's Cathedral, besides many other works by which they are well known in London and throughout the British possessions, and which have established them as bronze statue and art founders. Amongst the many works they have in hand is the equestrian statue of His Excellency the late commander-in-chief, General Dhir Shumshire Jung Rana Bahador (known as the Jewelled Prince), for the Nepal Government.

It should be a matter of regret to Londoners that the best art productions of this country are commissioned by our colonists.

WOOD-WORKING IN AMERICA.

THE progress made in the art of wood-working, writes Mr. C. R. Tompkins, M.E., in the *Engineering Magazine*, forms an essential feature of the mechanical inventions and improvements which have distinguished the past century. This art was probably one of the earliest practised by man, and its importance is shown by the fact of its continuing to exist under conditions of constant development. As civilisation has advanced, demanding in each stage more comfortable dwellings, the skill of the worker in wood has fully kept pace with the times. It is not necessary to go back of our own century to find evidence that progress in this art has been equal to that of any other branch of mechanical development.

There are parts of the Old World noted for the grand specimens of architecture in stone which have come down from the Middle Ages, but the slow and laborious processes of hand-labour by which those structures were erected rendered them so costly that none but the wealthiest could hope to secure more than the rudest and most primitive forms of dwellings. Our forefathers in the settlement of America, on account of the scarcity of suitable materials and the great cost of skilled labour, were obliged to be content with log cabins, which seem to have been the prevailing type of dwelling until wood-working machinery came into use.

The saw-mill was introduced soon after the settlement of the colonies, previous to which all the cutting of lumber into boards or planks, both in this country and in England, was performed by hand by the process known as pit-sawing. The log was placed upon a pair of saw-horses high enough to allow one man to stand beneath the log while the other stood upon

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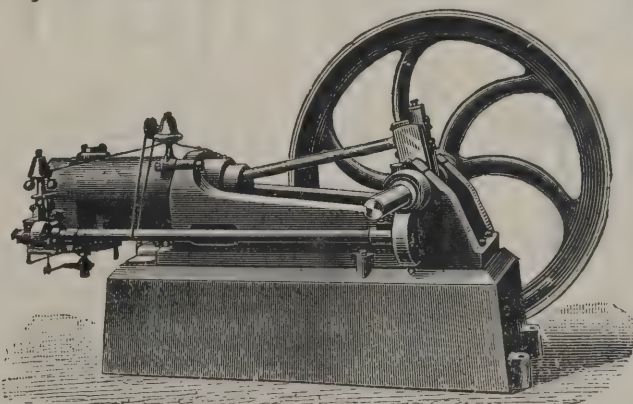
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it, the two working a saw of sufficient length. Long after the introduction of the saw-mill, pit-sawing was practised in many shipyards, and most of the planking and other timbers used in a vessel were sawed in this manner. Improved machines and appliances for wood-working, as well as in every other mechanical industry, have always met with strong opposition from the ignorance, and want of foresight on the part of the working-men employed. When the first attempt was made to introduce the saw-mill in England, the hand-sawyers by their opposition practically placed a veto upon it. It is stated that in 1663 an enterprising company employed a Dutchman to erect a saw-mill in London, but that the enterprise had to be abandoned on account of the opposition of the hand-sawyers. In 1767 a saw-mill was erected and operated by a windmill at Limehouse, England, but it was soon destroyed by a mob. Another, erected in the south of Scotland about the same time, shared the same fate.

It is probable that the United States may justly claim the honour of being the first country to successfully introduce the saw-mill as an aid to the cutting of lumber. At least it was not until large quantities of sawed lumber had been exported by the Dutch from New York into England that the hand-sawyers would allow saw-mills to be erected in the latter country. There was less opposition to the saw-mills in America on account of the abundance of timber and the demand of the colonists for cheap lumber for building purposes, while the hand-sawyers were few in number and confined to the few shipyards. There was almost no attempt made to put hand-sawed lumber upon the market for building purposes. The saw-mill had the effect of rendering building materials cheaper and more plentiful, so that log-cabins in the principal towns soon began to give way to the more sightly and convenient framed structures. These, although an improvement upon the log cabin, were necessarily very plain, from the fact that no machinery aside from the saw-mill had been invented for dressing it. Consequently all the lumber used had to be dressed and fitted by slow and expensive hand-labour, and, except in the case of a few of the more wealthy, no attempt was made for improvement in either style or architecture until within comparatively recent years.

Next to the saw-mill, the most important machine that has been introduced, and one that has had more effect upon the progress of building than any other, is the planing-machine, which dates from the invention of William Woodworth, in 1826. Not only did the work of the planing-machine of itself

give a great impetus to the art of wood-working, but its introduction demonstrated that lumber could be dressed rapidly by the action of rotary cutters, leading inventors to apply the same principle to machines for other uses. The planing-machine may be considered as an American invention, although rotary cutters were used in England long before the Woodworth planer was invented. There is no record, however, that any successful planing-machine, with an automatic feed, was ever put upon the market for wood-working previous to that time.

The same spirit of opposition which manifested itself among the British hand-sawyers against the saw-mill appeared among the journeymen carpenters upon the introduction of the planing-machine. As soon as it was demonstrated that boards could be successfully planed and matched by machinery faster and more accurately than by hand, such excitement and indignation were expressed among the journeymen carpenters that the building in which the machine was located had to be watched day and night for months, lest it should be burned. The carpenters claimed that, if machines of that kind were allowed to come into general use, they would soon be thrown out of employment, and their families would suffer for the necessities of life. In some cities they refused to lay flooring that was planed and matched by machinery. But the planing-machine gradually worked its way into public favour, and the carpenters found that, instead of injuring their trade, it made more work for them, with less labour than before. Building soon began to increase, and it has continued to increase just in proportion as the materials have decreased in price through the aid of machinery, until it is doubtful whether a journeyman carpenter could be hired to plane and match hard wood flooring by hand, as carpenters were obliged to do in former years. The effect upon the wages of the journeyman carpenter is another proof that machinery has benefited instead of injuring their trade. If we go back fifty years, when all the materials of wood necessary for a building were dressed by hand, the average wages of the journeyman carpenter was about a dollar per day of twelve to fifteen hours. Now good journeymen carpenters in the cities find no trouble in obtaining from 2:50 dols. to 3 dols. per day of ten hours, while in some places nine hours constitute a working day.

While the introduction of the planing-machine effected a great change in the cost of dressing lumber, yet in the earliest form it was far from the perfection found in the modern machine. One objection to it was the imperfect manner in which the lumber was planed upon the ends of the boards,



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there being no device, aside from the feed-rolls, for holding the ends down. Although they were placed as close to the cut of the knife as practicable, yet the distance from the centre of the roll to the cut of the knife was always from four to six inches. Consequently, when brought to the action of the cylinder knives, the end would lift from the bed and be shattered, so that several inches had to be cut off of the end of each board as waste. The invention of the chip-breaker—so called—was intended to remedy this fault, and it is applied now to all modern machines, not only to the cylinder but to the side cutters also, rendering the lumber both in the planing and matching as perfect upon the ends as in any other part. The chip-breaker consists of a small weighted roller or pressure-bar placed directly in front of the cylinder, so that the end of the board after it leaves the first pair of rolls is held firmly down to the bed until it passes the cylinder and is caught by the rolls directly behind. The beader is another improvement in wood-working appliances. The earlier wood-workers were satisfied with a machine that would simply plane and match, and where beaded ceiling was required the bead was struck by the carpenter with a hand-plane. But the progress in wood-working demanded a machine that would not only plane and match ceiling, but stick the bead also at the same operation, and the necessary devices for that purpose were soon invented, so that lumber now dressed at the mill is sent out in such a state of perfection that little or no hand labour is required aside from fitting it in its proper position in a building.

The moulding-machine, with its modern improvements, has had much to do with progress in wood-working. Before the invention of this useful machine all mouldings were worked by hand, and only the plainest and simplest style of mouldings were used, but the demand for more artistic wood-work has brought the improved moulding machine into general use. But still the demand for artistic wood-work continued, and it has led to the invention of many other complicated and useful machines. Not only intricate carved work, but irregular-shape mouldings of the most elaborate kind, which were formerly worked only by hand, are now produced by special machines which perform their work more accurately and in less time and more cheaply than hand-labour. This change has demanded not only more accurate and skilfully-constructed wood-working machines, but a more skilful and intelligent class of wood-workers to operate them. In machine-stuck mouldings especially there is a great change as compared with those stuck at the present time and those of a few years ago. Architects

and builders are far more exacting than they were formerly. Once they were satisfied with mouldings provided they were of the correct shape and of an even thickness, and, if the surface required smoothing down by the liberal use of sand-paper or sometimes the moderate use of a hand-plane, no objection was heard. Even with the imperfect state of the art the moulding-machine was far preferable to the hand.

Competition among machine manufacturers, and the desire of one to excel another in quantity and quality of work, together with the increasing demand of architects and builders for better machine-work and less hand-labour, has brought the moulding-machine to such a state of perfection that the most intricate designs in mouldings are now made both in hard and soft wood, so smooth that even the use of sand-paper may be dispensed with. This of course requires mechanical skill on the part of the wood-worker in order to keep the machine in perfect adjustment and the cutting tools in perfect order.

Probably no other branch of the art of wood-working has made more rapid advances than the manufacture of furniture by the use of machinery. It does not require a very old man to remember when most of the furniture was manufactured by hand, and the village cabinet-maker, who was also an undertaker, was an important personage. When a young couple were married, the cabinet-maker was called upon to furnish the necessary furniture for house-keeping; when baby was born, none but the cabinet-maker could furnish him with a suitable crib; and when death invaded the domicile, his services were again called into requisition to furnish a suitable casket and assist in consigning the body to its last resting-place. But the rapid progress in the art of wood-working has wrought a complete change. The village cabinet-shop has changed to the furniture store, and undertaking has become a distinct branch of business, the supplies in both cases being obtained from the factories, where machinery performs the work more cheaply and accurately than hand-labour. It is within comparatively recent years that the makers of wood-working machinery have turned their attention to the construction of machinery specially adapted to the manufacture of furniture. Formerly it was thought that the same class of machines used in planing-mills and sash and door-factories were also adapted to the manufacture of furniture. The use of such machinery tended to reduce materially the cost of production, but the pressure of competition in the furniture trade created a demand for better facilities in order to increase the output, while reducing the cost of production.

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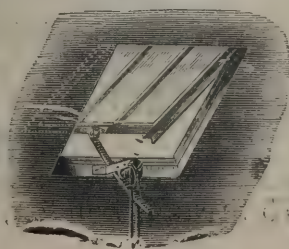
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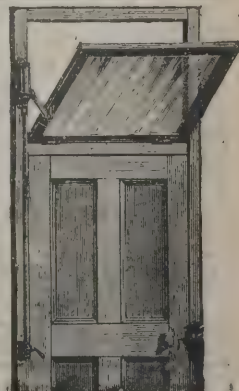
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The band-sawing machine proved to be so much more rapid and better adapted to this class of work that it superseded the jig-saw, and the improved shaper—or, as it is sometimes called, the variety moulding-machine—was another that became indispensable to the furniture manufacturer. This machine is comparatively an old one, but it required many improvements to bring it to its present state of efficiency and adapt it to the varied requirements of the modern furniture manufacturer. With the special attachments, it has almost entirely superseded hand-labour in working irregular and curved shapes. The dovetailing machine is another illustration of the mechanical skill and inventive genius that the progress in the art of wood-working has brought into requisition. The perfection and rapidity of its work is such that with the labour of one intelligent operator the same quantity of work is performed in the same time that would be required by a half-dozen men by the old processes. Other special machines might be mentioned that have been introduced from time to time as the art has progressed, while manufacturers and inventors are constantly on the alert, so that no sooner does it become known that a new style of work is called for, than a new machine is brought out specially adapted for this special purpose. Thus in the present state of the art of wood-working little is left to be performed by hand.

We often hear predictions from a certain class of men that the advance in the art of wood-working, as well as in other mechanical branches, and the introduction of labour-saving machinery, will eventually reduce the wages of the workman. It is safe as a rule to judge the future by the past, and we have already seen that the introduction of labour-saving machines, so far as the building business is concerned, has not only increased the demand for skilled workmen, but more than doubled their wages for fewer hours of labour. What is true with the wood-working trades is equally true with every other branch of mechanics where skilled labour is required. As late as the year 1856 first-class machinists could be hired at 1.75 dols. per day, and the necessary machinery for a planing-mill or other wood-working establishment was little if any cheaper than at the present time, although there is nearly double the work upon a modern planing-machine that there was upon machines of that date. There is no question but with the present facilities a manufacturer would be able to put upon the market machines of the style of 1856 at much less than they were then sold for. Now machines of more than double the capacity of the former, with all modern improve-

ments and conveniences, are afforded at about the same figures that were charged for them forty years ago. While manufacturers are realising about the same profits as formerly, they are paying for the same class of skilled labour from 2.50 dols. to 3 dols. per day. This change has been brought about by the countless labour-saving devices that have been introduced into the modern machine-shop, whereby one man with less manual labour is enabled to turn out double the amount of work in a given time; still the market is not overstocked with first-class machinists. Therefore it does not appear that the introduction of labour-saving machines has had an injurious effect upon machinists' wages. The same rule will apply to every other branch of mechanical business. Experience has proved that the introduction of any mechanical device that will lessen the cost of production, and enable the producer to put upon the market an article at less price, or a superior article at the same, will in every instance increase the demand. Nowhere is this principle better exemplified than in the products of wood-working machinery.

THE ABERDEEN GRANITE TRADE.

ACCORDING to the *Aberdeen Free Press* the year just closed has been a year of very fair prosperity in the granite trade. The American export trade continues to be the chief branch of the Aberdeen monumental trade, and it is satisfactory to note that, in spite of the operation of the McKinley tariff, the American trade continues to develop. This is doubtless in some measure due to the great strike in America, but apart from that even, it is only what was to be expected. Some two years ago, when the imposition of the new tariff was in prospect, and when a slight tendency to alarm was shown by the Aberdeen granite manufacturers, it was urged in these columns that the new system need really have no terrors for them. It is true that the American trade shrank somewhat last year, but that was probably the natural reaction from the excessive fillip the trade previously underwent in prospect of the rise in the duty. This year, as indicated, the American trade has gone upward. And not only has it become the chief branch of the granite industry, but by far and away the chief branch of the Aberdeen-American export trade. During the year the value of finished granite exported to the United States from Aberdeen was far more than the value of all other articles of export put together;

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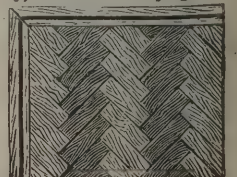


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for, while the total value of these articles—stationery, combs, fish, hides, herrings, breeding horses, linens, paper, woollen goods, whisky, &c.—was about 42,500*l.*, the value of granite monuments alone was about 67,000*l.* The rates accruing to the harbour of Aberdeen from the export of polished granite were 40*g.*, showing an increase of 62*g.* over the rates of the previous twelve months. It is only fair to remember that the credit of working up this important branch of local industry is less due to the local manufacturers than to the enterprise of the Americans themselves, who have sent over and established the agencies in the city that really carry on the trade. As evidence of the fact, it need only be mentioned that one, the oldest of these agencies, ships finished granite from the city to the value of about 450*g.* per week. While this is the present condition of the American trade, it is only right that manufacturers should know exactly what they have to face in the future. It is pretty clear that the Aberdeen American granite trade can only be maintained by the maintenance of the superiority of the Aberdeen material. It was the excellence of the Aberdeen granite, combined with undoubted excellence of workmanship, that gave this important branch of trade its rise. America now commands the most skilful workmen, and it is rapidly developing throughout the various States its own granite resources. Every year more granite is being utilised in the United States for monumental and decorative purposes, and in 1889—the statistics for which have only recently been published—the value of granite thus applied was 2,371,911 *dol.* It is evident, therefore, that if a superior stone does not continue to be sent from Aberdeen, America is not likely to go beyond her own borders for her granite supply. Other branches of the monumental trade have been fairly well maintained during the year. The Canadian trade is likely to rise in importance. It is being pushed chiefly by the American agents, and though yet far below the American trade in volume, being equal probably to less than one-sixth, it is full of promise as a field of operations in the future. The Australian trade, which has been growing slowly for the past few years, has received a momentary check from the imposition of an increased tariff by the colony of Victoria, backed by the flat condition of business in the country. A duty of 20 per cent. was previously imposed by Victoria—in which, of course, the chief Australian business was done—but in July last that was increased to 40 per cent., and along with the depression in business energy in the colony at present, that was too severe a strain not to be felt by the comparatively small Scotch granite

trade. The unfortunate thing about the matter is that New South Wales threatens to follow the example of Victoria, and in that case Sydney, with which some little business has been done during the year, may, like Melbourne, become pretty much a closed port to Aberdeen granite. Very little business has been done with South Africa during the year.

The home trade has been, if anything, somewhat steadier than during 1891. There has been an increase generally in the English trade—a fact that is chiefly accounted for by the growing demand for polished granite for building purposes. Many large contracts of this kind have been fulfilled during the year, and, indeed, there is a prospect that this may yet turn out to be a very much more important branch of the trade than it is at present. But, as already stated, though the volume of work has been increasing, the prices continue to show a downward tendency. Manufacturers complain greatly of the excessive keenness of competition, and urge—although perhaps in their extreme moments—that unless a change takes place some branches of the trade will not be worth following out. There is no doubt that prices are being cut to the very edge. The conditions of labour in the granite trade continue much the same as in 1891. Relations between the employers and the stone polishers were considerably disturbed in the early part of the year. The rupture began with resolutions of the Stone Polishers' Society—passed in the previous November—that the nine hours' day be demanded in all yards "on and after February 1," and that overtime be brought under certain restrictions. On February 9 twenty-eight Union polishers came out on strike, and on February 15 a general lock-out took place. Twenty-four yards were affected—two manufacturers, employing forty Union polishers, granting the demands of the men. Fully 300 men were idle during the lock-out, and the men resumed work without gaining their end on February 29. At the close of the lock-out thirty-two of the 280 members of the Union who were out failed to find employment, but they were all at work again within a month. After the strike time-work was largely introduced to all machine polishers, but the system has partly fallen through, and piece-work has again been adopted in various yards. The pay of the stone polishers averages from 4*d.* to 6*d.* per hour. An agreement as to the pay for overtime was come to in the middle of May. Overtime for the first 160 hours of work is paid for at the rate of time-and-quarter, after 160 hours time-and-half. At present six firms grant their polishers the nine hours' day, all the others work the ten hours. The relations between the employers and the operative masons and

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stonecutters have been unruffled during the past twelve months. The Operative Stonecutters' Society is a particularly strong body, numbering 1,660 members, and to this fact is due perhaps the maintenance of a happy equilibrium during the year. The standard rate of pay continues, as in the previous year, to be 6½d. per hour for those stonecutters engaged in the monumental trade, and 7d. for those in the building line. The working of overtime was for a long time the bane of the granite trade, for masters and men alike, but matters have improved vastly in this respect in recent days. At the present time, largely owing to the operations of the men's society, although a little overtime is being worked in some of the smaller yards, practically none is being worked in yards of any importance. One of the features of the granite trade is the large number of stonecutters who, attracted by the higher pay, leave Aberdeen for the United States in the earlier months of the year. During 1892 about 120 men thus emigrated. Owing, however, to the break-out in May of the great strike in the American granite trade, which still in many parts drags its weary length along, emigration from Aberdeen was checked, and many of those who left the city soon found their way back. There are, and have been throughout the year, very few stonecutters out of employment. And it is satisfactory to be able to say that the outlook for the coming months for both masters and men is hopeful.

The importation of foreign granites has attained to large proportions, and it is bound to have an effect on the local quarrying industry. During the past year there has been landed at the Aberdeen quays from Norway and Sweden close on 7,000 tons of rough granite, representing a money value in rough stock of between 1,400*l.* and 1,500*l.* And the trade continues to increase as new varieties of foreign stone are discovered. The Aberdeen manufacturers, unable to find a sufficient supply of home material, tried the foreign granite a few years ago by way of an experiment. To-day the foreign granite is, in many cases, preferred to the local material. A German stone was first tried, but though large quantities were for a time wrought, it proved utterly unreliable, and has now disappeared from the market. The Swedish and Norwegian promises better, and as this is found in every variety of colour—red, and blue, and green, and black, and grey—it has certainly caught the public taste. It is very little, if any, cheaper than home granite, although there is not on it the same "sliding scale" as in the case of the home material, by which the cost of a block per foot rises in proportion to its size, but the foreign stone can be had in great abundance, and orders

may be executed in it with the greatest despatch. The importance of this, in the American trade especially, is very great, and as a consequence about two-thirds of the American orders are finished in Swedish and Norwegian granite, the rest of local stone. Within the last few months a new, well-coloured grey granite has been imported from Finland by Messrs. Stewart & Co., of the Bon-Accord Granite Works. Though slightly darker, it bears a close resemblance to Dyce granite. Two cargoes have been brought to Aberdeen already, and as the stone takes on a fine polish, it would probably share the demand of the other Continental stones but for the fact that the heavy cost of bringing it over is likely to stand in its way. Some little time ago attention was drawn to the Aberdeen granite trade by a statement by Mr. Carnegie, of Pittsburgh, that rough American granite was actually being brought to Aberdeen, made into monuments, and re-shipped to America. This is, indeed, a case of bringing coals to Newcastle, but all the same the statement was quite accurate, although the excuse would probably be urged that the system is worked on a very small scale. During the past year one or two deliveries, amounting in all to about an average cargo, of dark grey Quincy granite have been imported into Aberdeen and formed into monuments. Canada has hitherto been the destination of the finished work, but it is right to add that the granite has not been disposed of as "Aberdeen" granite.

DRAINAGE OF LONDON BOARD SCHOOLS.

THE magistrate at the Clerkenwell Police Court has given a decision in the case brought on summons against the London School Board by the Islington Vestry for permitting "two foul and defective 9-inch drains" to exist at their premises, the Verbury Road School, "it being necessary to remove the same and to substitute for them two 6-inch glazed stoneware pipe-drains." A second summons complained that the Board allowed drains to exist at the Hanover Street School which were in such a state as to be a nuisance or injurious to health.

Mr. Horace Smith, who visited the school, said that the School Board, upon receiving notice from the vestry, agreed to do some portion of the work required, but with respect to the drains, they decided, after taking proper advice, that they ought not to be called upon to incur a large expenditure for the sake of a doubtful benefit. He had come to the conclusion that both the drains in question were inefficient and were a nuisance

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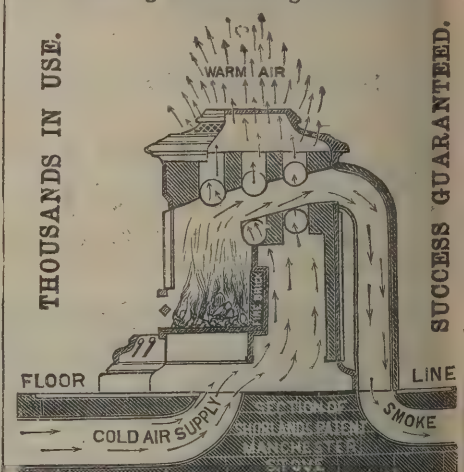


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and injurious to health. He found as a fact that the 9-inch drain was laid in an improper manner. The gradient was irregular and insufficient, and the joints were so badly put together that they caused a leakage of sewage-matter into the soil. It was suggested by the School Board that, although the gradients were irregular, yet by a sufficiently frequent and ample flushing the drain might be left clear; but he found that even if a full flushing were regularly performed there was not sufficient power of flushing the 9-inch pipe. Even if a sufficient quantity of flushing could be obtained to cleanse such a drain, the leakage of the joints would still render the drain inefficient and would allow sewage to percolate into the soil. It had been further urged by the Board that, admitting that the drain was badly laid and that sewage-matter percolated into the soil, yet the soil was stiff London clay, and so no escape of gas would be possible. He would not decide whether a drain perfectly cased in London clay would be so secure as to prevent the possibility of the escape of sewage-gas, but the drain in question and also the 6-inch drain were not perfectly cased in clay, but were laid in a great measure in a soil of a varied character and quite capable of being percolated by sewage and by sewage-gas. It was further urged that the drains were some distance from the schoolrooms, and that the playground and schoolrooms were covered with a thick coating of tar-paving. He was of opinion, however, that it was far from impossible that sewage-gas should not reach as far as the school buildings, and that in case of the cracking of the surface at any time there would be great danger. That being the case there was also danger from the roof water-pipes which ran inside the school buildings becoming contaminated by reason of the percolations from the leakage of the badly-laid pipes; but if the drainage were made thoroughly efficient there would be no objection to the position of the roof water-pipes. The 6-inch pipe running from the caretaker's house appeared to leak throughout, and must be properly relaid and made watertight. He made an order for the abatement of the nuisance and a closing order prohibiting the school from being used until it had been made fit for habitation. Mr. Smith allowed the vestry 5*l.* 5*s.* costs. The second summons, in reference to the Hanover Street School, was adjourned *sine die*, as it was stated that the Board were doing the necessary work in that school. The magistrate was asked whether the Board were required, by his worship's decision, to relay both the pipes at the Yerbury Road School. Mr. Smith said that they were, because he found that the gradients were bad as well as the joints.

REGISTRATION OF PLUMBERS.

DR. TWEEDY, F.R.C.P., speaking on the occasion of the recent visit of the Lord Mayor of London to Dublin, and referring to an illuminated address presented to the Lord Mayor by the plumbers of Dublin and the district, said it was a great pleasure to him to be allowed to add a few words of welcome to the address which had just been presented. The local District Council for the National Registration of Plumbers had, in his opinion, acted very wisely in making itself as representative as possible. It had not confined itself to having among its members merely those connected with sanitary engineering, but had called in also members of other corporations to assist in its deliberations. This arrangement seemed to him particularly felicitous in the case of the Royal College of Physicians, which he had the honour to represent. That body had always had at heart the interests of technical education, and among the items now in the curriculum which had been introduced for perfecting the education of those engaged in their own particular profession were the subjects of hygiene, public health and preventive medicine, and in carrying out the practical details of that they were entirely dependent upon practical workers in sanitary engineering. The College of Physicians had also another bond of sympathy with this Association, and that was in the question of registration. Education was all very well in its way, but the test of an education being sound was by examination, and he rejoiced that this Association for the Registration of Plumbers was following up a sound and practical education by insisting upon the registration of all who chose to join the Association. It was a great pleasure to see the Lord Mayor of Dublin having as his guest the Lord Mayor of London, for there was fresh in the minds of some of them the gracious and genial reception which Mr. Alderman Knill gave as chairman of the Reception Committee of the great Sanitary Congress which assembled in London last year. He believed that the visit of the Lord Mayor of London would be productive of great and far-reaching results, and he was glad to hear that he was going to visit the young men actually at work.

The Corporation of Halifax have announced their intention not to appoint any plumbers as "Corporation authorised plumbers" unless they are upon the register of the Worshipful Company of Plumbers.

At the annual public meeting, recently held in Glasgow under the auspices of the Glasgow and West of Scotland

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District Council for the National Registration of Plumbers, the District Council, in concluding their report, state that there is ample reason for satisfaction at the progress which the registration movement is making. The foregoing pages show that the value of national registration is becoming more and more apparent to all who have at heart the health of the community. The work which is being done in the direction of educating the younger members of the trade cannot but result in advantage to all concerned. With the aid of the expected Parliamentary measure, it may be predicted that in no long time every competent plumber will find it not only expedient, but necessary, to be upon the register, and the beneficial result of that will be seen alike in the protection of the public from the evils arising from insanitary conditions and in the advancement and elevation of the plumbers' honourable craft.

ELECTRIC LIGHTING IN ST. PANCRAS.

ACCORDING to a report by Mr. T. Eccleston Gibb, vestry clerk of St. Pancras, showing the success which has attended the installation by the vestry of the system of electric lighting applied to the south-western portion of the parish, the receipts from November 9, 1891, to November 8 last were 7,620*l.* 5*s.* 7*d.* and the working expenses 6,552*l.* 5*s.* 7*d.* Thus there was a balance towards the payment of interest on and repayment of loans of 1,068*l.* It is pointed out that the expenditure was upon a plant which for a large part of the time covered by the accounts was not doing a tithe of the work it was capable of performing. Last winter there were but few customers, and during the summer of course comparatively little light was needed. During October last, while yet the plant was not in full use, the receipts reached 1,023*l.* 5*s.* 2*d.* Upon this Mr. Gibb anticipates that the total annual income from this source will be, without any extension of plant, at least 10,000*l.*, and this, too, exclusive of the value of the current used for public lighting, representing about an additional 3,000*l.* Having regard to constantly increasing demands for current, and in order that plant now lying idle might be utilised, the vestry are advised to borrow a further 30,000*l.*, making the total capital for the present installation 100,000*l.* The vestry's expenditure compares favourably, Mr. Gibb says, with that of the principal electric companies. He goes on to say that it will be necessary before long to construct two other installations, involving a large increase of capital. In conclusion, Mr.

Gibb remarks on the advantages of electric lighting over gas, especially in regard to light, cost and risk from fire. Professor Robinson, consulting electrical engineer to the vestry, reports that one very probable means of diminishing the cost of production of electricity will be by adopting a system of "thermal storage," by which the boilers are worked continuously, and the heat generated during periods of little or no demand is stored up in water heated to a high temperature, at high pressure, for utilisation at the times of maximum demand.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

23736. Jonathan Hurn Faulkner, for "Improvements in and relating to coin-freed locks and mechanism."

23743. Constantine Henderson, for "A new or improved sash-fastener."

23749. Louis Jean Jacques Aubert, for "An implement for use in levelling or ascertaining gradients."

23829. Frederick de Jersey Clere, for "Improvements in the construction of window-sashes to facilitate cleaning and other purposes."

23884. Henry Leggott, for "Improvements in fire-grates."

23904. Thomas Fitch Rowland, for "Improvements in hydraulic elevators, lifts and the like."

23964. John Wilson Wright, for "Improvements in sash-fasteners."

24022. John Harrison, for "Improvements in sash-fasteners."

24033. Ernest William Beech, for "Improvements connected with locks and latches, also keys and handles for the same."

24164. Lucien Eilertsen, for "Improvements in or connected with cocks or valves for maintaining the water-level in steam boilers, and for other purposes."

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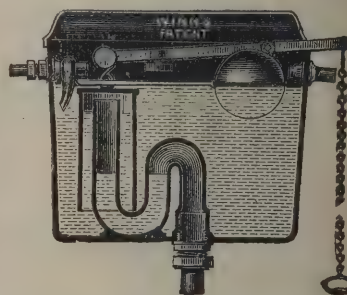
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The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200*l.*, 150*l.* and 100*l.* Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

PLYMOUTH.—Plans, Sections, &c., are Invited for Housing Working Classes. Premiums of 50*l.*, 25*l.* and 15*l.* Mr. J. H. Ellis, Town Clerk, Municipal Buildings, Plymouth.

WAKEFIELD.—Feb. 1.—Designs are invited for the Erection of Council Chamber, Committee Rooms and Offices. Mr. F. Alvey Darwin, Clerk of the Peace, West Riding Offices, Wakefield. Premiums of 200*l.*, 100*l.* and 50*l.*

WINSFORD.—Feb. 13.—Designs, Estimates, &c., are Invited for Proposed Technical Schools and Gymnasiums. Premiums of 50*l.*, 15*l.* and 10*l.* Mr. J. Cowley, Secretary, 38 Witton Street, Northwich.

CONTRACTS OPEN.

ABERAMAN.—Jan. 21.—For Building Three Dwelling-houses and Business Premises. Mr. Charles H. Elford, Architect, Aberdare.

ABERCARN.—Jan. 30.—For Building Master's House at Cross Roads School. Mr. George Rosser, Architect, 29 High Street, Newport.

ACCRINGTON.—For Building Five Shops. Messrs. Haywood & Harrison, Architects, Commercial Chambers, Accrington.

ALSTON.—Jan. 28.—For Building Farmhouse, Tyne Head. Messrs. Webster, Son & Banks, Land Agents, Kendal.

AMLWCH.—Jan. 29.—For Building Semi-detached Villa Residences, Construction of Roads, Drains, &c., Bull Bay. Mr. Robert Grierson, Architect, Bangor.

BARKING.—Jan. 24.—For Building Public Offices and Public Library, Fire Station, Mortuary, Stabling, Cart Shedding, and Cottage. Mr. C. J. Dawson, Architect, East Street, Barking.

BELFAST.—Jan. 23.—For Building Constabulary Barrack. Mr. T. J. Tuohy, Secretary, Office of Public Works, Dublin.

BELFAST.—Jan. 24.—For Building Goods Store, 300 feet by 120 feet, at Terminus. Mr. John Milliken, Secretary, Belfast.

BRADFORD.—Jan. 23.—For Building Store. Messrs. Rycroft & Firth, Architects, Bank Buildings, Manchester Road, Bradford.

BRADFORD.—Jan. 23.—For Adding Storey to Wing of Technical College. Mr. T. C. Hope, Architect, 27 Kirkgate, Bradford.

BURNLEY.—Jan. 25.—For Works for Entrance Lodge at New Park. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

BURNLEY.—Feb. 8.—For Plumbing, Glazing, Painting and Hot-water Apparatus, for New Workhouse Infirmary. Mr. S. Keighley, Architect, Nicholas Street, Burnley.

BURSLEM.—Jan. 21.—For Rebuilding the Rose, Shamrock and Thistle. Mr. A. R. Wood, Architect, Tunstall.

BURY.—Jan. 30.—For the Walls for New Buildings for the Textile Operatives' Association. Mr. D. Hardman, Architect, Silver Street, Bury.

COLCHESTER.—For Rebuilding Furniture Depository. Mr. J. W. Start, Architect, Cup's Chambers, Colchester.

CORNWALL.—Jan. 25.—For Restoring St. Keverne Church. Mr. Edmund Sedding, Architect, 7 Buckland Terrace, Plymouth.

CWMAMAN.—Jan. 21.—For Building Four Houses. Mr. T. Roderick, Architect, Ashbrook House, Clifton Street, Aberdare.

DARTMOUTH.—Jan. 31.—For Construction of Sewers. Mr. T. O. Veale, Borough Surveyor.

DEWSBURY.—Jan. 23.—For Alteration of Warehouse. Messrs. John Kirk & Sons, Architects, Dewsbury.

DUMFRIES.—Jan. 31.—For Mason and Ironwork for Bridge at Drumpark. Mr. J. Symons, Writer, Dumfries.

DUNDALK.—Jan. 30.—For Building Offices, Waiting-rooms, Refreshment-rooms, &c., at New Station. Mr. W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin.

DUNDALK.—Feb. 13.—For Construction of Sewers. Mr. J. Gaskin, Surveyor, Town Hall, Dundalk.

ELLAND.—Jan. 23.—For Building Villa. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

ELLAND.—Jan. 26.—For Building Fire Brigade Station and Sanitary Depot. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

FOLESHILL.—Jan. 31.—For Building Senior Boys' School. Messrs. G. & J. Steane, Architects, 22 Little Park Street, Coventry.

GREAT MISSENDEN.—For Alterations to Premises. Mr. H. D. Searles Wood, Architect, 157 Wool Exchange, Coleman Street, E.C.

GREENOCK.—Jan. 25.—For Construction of Sewage Works and Tanks for Kilbarchan Special Drainage District. Mr. James Barr, Engineer, 221 West George Street, Glasgow.

GWAELODYGARTH.—Jan. 31.—For Building Master's House. Mr. R. Y. Evans, Guildhall Chambers, Cardiff.

HALIFAX.—Jan. 24.—For Additions to North Park. Messrs. G. Buckley & Sons, Architects, Tower Chambers, Halifax.

HALIFAX.—Jan. 28.—For Building House, Stables, &c. Mr. Raymond Berry, Architect, Arcade Chambers, Halifax.

HANDSWORTH.—Jan. 31.—For Additions to Board Schools, Boulton Road. Mr. J. R. Nichols, Architect, 59 Colmore Row, Birmingham.

HASLINGDEN.—Jan. 28.—For Building Vicarage. Mr. H. Fielding, Architect, Haslingden.

HOYLAND.—Jan. 25.—For Building Four Houses. Mr. Walter J. Sykes, Architect, Hoyland, Barnsley.

ILLOGAN.—Jan. 30.—For Additions to Board Schools. Mr. Sampson, Architect, Symon's Terrace, Redruth.

KING'S CROSS.—Jan. 28.—For Pulling-down Octagon Tower. Mr. W. H. D. Horsfall, Architect, 9 Harrison Road, Halifax.

KING'S LYNN.—Jan. 28.—For Building Technical School. The Borough Surveyor.

LEEDS.—Jan. 25.—For Building Fifty Houses. Mr. Wm. Bell, Architect, North-Eastern Railway, York.

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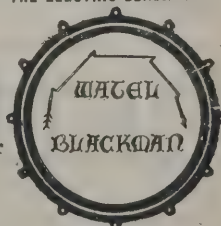
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LEICESTER.—Jan. 26.—For Construction of Brick and Pipe Sewers. Mr. E. G. Mawbey, Borough Surveyor, Town Hall, Leicester.

LLANDAFF.—Jan. 23.—For Building Master's House and Cottage, for Cathedral School. Messrs. Halliday & Anderson, Architects, 19 Duke Street, Cardiff.

LONDON.—Jan. 27.—For Addition to Patent Office. H.M. Office of Works, 12 Whitehall Place, S.W.

LONGFORD.—Jan. 21.—For Building Post Office and Residence. Mr. J. H. Roynan, Architect, Nenagh.

LUTON.—Jan. 24.—For Alterations and Repairs to Premises and Town Hall. Mr. T. R. Roscoe, Borough Surveyor.

LYNDHURST.—Jan. 23.—For Construction of Two Small Powder Magazines, Concrete Vault, Machine House, &c. Messrs. Lemon & Blizard, Engineers, Lansdowne House, Castle Lane, Southampton.

MANCHESTER.—For Building 110 Cottages. Mr. J. H. Pemberton, 40 Brazenose Street, Manchester.

MARYBOROUGH.—Jan. 30.—For Building Chapels and other Additions to Lunatic Asylum. Mr. Thomas Drew, Architect, Dublin.

MERTHYR TYDFIL.—Jan. 28.—For Building Thirty-three Houses. Mr. John Williams, Architect, Edward Street, Morgan Town, Merthyr Tydfil.

MERTHYR TYDFIL.—Feb. 7.—For Building School. Mr. Morgan, Master, Workhouse, Merthyr Tydfil.

MILE END.—Jan. 30.—For Building Pavilions, Laundry Block, Kitchen, Boiler-house, &c., at Workhouse. Mr. Bruce J. Capell, Architect, 70 Whitechapel Road, E.

MILLOM.—Jan. 30.—For Building Board School for Girls and Alterations to School. Mr. W. T. Lawrence, Milloim.

MISKIN.—Jan. 27.—For Building Hotel. Mr. T. Roderick, Architect, Clifton Street, Aberdare.

NEW BROUGHTON.—Jan. 21.—For Building Wesleyan Chapel. Mr. Robert Williams, New Broughton, Wrexham.

NEW CROSS.—Jan. 24.—For Building Fire-brigade Station. The County Council, Fire Brigade Branch, 21 Whitehall Place, S.W.

OTTERBOURNE.—Feb. 4.—For Building Police-station. Mr. J. Cresswell, County Architect, Moot Hall, Newcastle-on-Tyne.

OXFORD.—Feb. 7.—For Erection of Municipal Buildings. Mr. Henry T. Hare, Architect, 1 York Buildings, Adelphi, W.C.

PETERBOROUGH.—For Building Residence. Mr. M. Hall, Huntly Grove, Peterborough.

PORTSMOUTH.—Feb. 21.—For Construction, Alterations and Reparation of Sewers, for the Urban Sanitary Authority. Mr. Alexander Hellard, Town Clerk.

PRESTON.—Jan. 24.—For Building Grain Shed, 552 feet by 100 feet. Mr. Henry Hamer, Town Clerk.

PWLLGWYN.—Jan. 31.—For Building Infants' School. Mr. J. J. Evans, C.E., Penarth.

SHIPLEY.—Jan. 24.—For Building Two Houses. Mr. W. H. Beevers, Architect, 25 Bond Street, Leeds.

ST. AGNES, REDRUTH.—Jan. 24.—For Building Coastguard Station. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

ST. GEORGE.—Jan. 23.—For Building Higher Grade and Technical School. Mr. F. Bligh Bond, Architect, 36 Corn Street, Bristol.

STRICHEN.—Jan. 26.—For Building Church. Mr. Duncan M'Millan, Architect, 211 Union Street, Aberdeen.

SWANSEA.—Jan. 26.—For Construction of Sewers, &c. The Borough Engineer.

TREHARRIS.—Feb. 8.—For Enlarging Chapel. Mr. E. E. Watkins, Grocer, Penn Street, Treharris.

WIMBLEDON COMMON.—Feb. 7.—For Pulling Down and Rebuilding Windmill. Mr. Jesse Reeves, Manor Cottage, Wimbledon Common.

TENDERS.

ALDERSHOT.

For Building Petty Sessions Room and Alterations and Additions to Police Station, Aldershot. Mr. JAMES ROBINSON, A.M.I.C.E., County Architect, Southgate Street, Winchester.

G. Kemp, Aldershot.	£2,832	0	0
Simonds Bros., Reading	2,662	0	0
J. H. CORKE, Southsea (accepted)	2,550	0	0

BANDON.

For Repairs to Courtmacsherry Pier. Mr. NAT. JACKSON, County Surveyor, Bandon.

M. Collins, Innoshannon	£793	14	0
D. P. HAWKES, Bandon (accepted)	500	0	0



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C. Winterburn, Whitby	£932	19	10
G. Hall, Sheffield	913	4	2
Hutchinson Bros., Barnsley	898	0	0
A. Beaumont, Royston	888	6	11
Riley & Robinson, Halifax	870	0	0
C. Green, Rotherham	831	18	0
Rogers & Squires, Barnsley	823	5	6
G. Taylor, Blackburn	813	6	8
Brookman, Morley	775	7	6
Parkinson & Baum, Halifax	730	0	0
J. Tuppett, Sheffield	712	7	2
T. & J. Young, Wakefield	652	1	3
J. Barston, West Ardsley	647	0	9
Dolman & Booth, Dewsbury	579	4	2
Porter & Higham, Barnsley	576	0	0
H. BURROWS & SON, Barnsley (accepted)	575	3	2
Surveyor's estimate	646	10	8

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T. Lansbury, Bromley	£547	1	1
Woodham, Fry & Fry, Greenwich	525	10	3
J. MOWLEM & CO., Westminster (accepted)	490	0	0

CROYDON.

For Repair of Roads, South Norwood, for the Corporation.
Mr. W. POWELL, Borough Surveyor.

Werndee Road.

A. Bullock, Croydon	£276	10	3
H. LAKE, Croydon (accepted)	274	1	3

Balfour Road.

A. Bullock	281	16	4
H. LAKE (accepted)	280	0	11

Stanger Road.

A. Bullock	88	12	6
H. LAKE (accepted)	86	12	7

Crowther Road.

H. Lake	344	10	3
A. BULLOCK (accepted)	338	12	3

DROITWICH.

For Sewering the Witton Estate (about 600 Yards of 9-inch Pipe Sewers). Mr. B. GODFREY, Borough Surveyor, Droitwich.

S. Hipwell, Wisbech	£575	0	0
Jones & Fitzmaurice, Birmingham	470	0	0
T. Jones & Son, Droitwich	450	0	0
H. Welsh, Hereford	439	0	0
T. Vale, Stourport	370	0	0
J. Jameson, Birmingham	337	0	0
CRUWYS & HOBROUGH, Gloucester (accepted)	330	9	10
G. Trentham, Birmingham (too late)	—	—	—
Surveyor's estimate	360	0	0

EASINGWOLD.

For Restoration of Bridge over River Kyle, Newton-upon-Ouse, and Repairing and Embanking Road Approaches on both sides of the Bridge.

Wood & Blackburn, Stillington	£600	6	8
J. Keswick, York	538	0	0
W. Blackburn, Welburn	531	18	6
J. Foster, Linton-on-Ouse	497	7	6
T. Poppleton, Easingwold	470	0	0
T. Bell, Market Weighton	409	9	7
PARKER & SHARPE, Peasholme Green (accepted)	406	18	2

HORNSEY.

For Making-up Private Roads, for the Hornsey Local Board.
Mr. T. DE COURCY MEADE, Engineer and Surveyor.

North Hill Avenue.

B. Cooke & Co., Battersea	£461	0	0
Wm. Griffiths, Kingsland	443	2	6
THOMAS ADAMS, Wood Green (accepted)	433	5	6

Claremont Road (Third Section).

B. Cooke & Co., Battersea	711	0	0
Wm. Griffiths, Kingsland	667	4	0
Sidney Hudson, Dulwich	677	1	6
THOMAS ADAMS, Wood Green (accepted)	652	18	2

Stanhope Road (Second Section).

B. Cooke & Co., Battersea	2,057	0	0
Wm. Griffiths, Kingsland	2,054	18	3
Sidney Hudson, Dulwich	1,963	9	8
THOMAS ADAMS, Wood Green (accepted)	1,948	7	6

Nelson Road (Second Section).

B. Cooke & Co., Battersea	3,132	0	0
Wm. Griffiths, Kingsland	3,003	15	1
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U. Beduwe, Liège (650 gallons)	560	0	0

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For Rathcool Estate Sewers, for the Hornsey Local Board. Mr. T. DE COURCY MEADE, Engineer and Surveyor.

T. Adams, Wood-Green	£2,294	18	3
B. Cooke & Co., Battersea	2,251	0	0
H. Drury, Harrow	2,244	18	7
T. G. DUNMORE, Crouch End (accepted)	2,189	0	0
J. Bentley, Leicester.	2,114	0	0

For Repairs to several Houses at Mary Ann Street, Severn Street, Pinchin Street, Stutfield Street and Philip Street, St. George's-in-the-East, for the Trustees of the Oakley Estate. Mr. ALBERT E. PRIDMORE, Architect, 2 Broad Street Buildings, E.C.

Little & Senecal	£1,425	0	0
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H. Bradford	1,010	0	0
T. Elkington	840	0	0
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For Additions and Alterations to the Empire Hotel, 44, 45 and 46 Leicester Square, for Mr. Conrad Vonhagen. Mr. COX DEAR, M.S.A., Architect, 117 Great Russell Street, Bloomsbury.

MILROY (accepted)	£620	0	0
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For Decorations, &c., at the French Club, 72 Oxford Street, for La Société Nationale Française. Mr. COX DEAR, M.S.A., Architect, Bloomsbury.

McMILLAN & HOUGHTON (accepted).

For Additions and Alterations to the Shakespeare Hotel, Kilburn, for Mr. W. S. Jones. Mr. COX DEAR, M.S.A., Architect, Bloomsbury.

MILROY (accepted)	£643	0	0
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For Construction of Block of Underground Conveniences, Tottenham Court Road, for the Vestry of St. Pancras. Mr. W. N. BLAIR, Engineer, Vestry Hall.

G. Jennings, Lambeth	£1,999	0	0
C. W. Killingback & Co., London	1,971	0	0
J. Bentley, Leicester	1,961	0	0
H. Wall & Co., Kentish Town	1,918	0	0
J. Allen & Sons, Kilburn	1,865	0	0
B. FINCH & Co., Lambeth (accepted)	1,799	0	0

For Sanitary Alterations and Improvements at No. 12 Leadenhall Street, for Messrs. D. Sassoon & Co. Mr. WALTER J. EBBETTS, F.R.I.B.A., Architect, Savoy House, 115 Strand.

Bolding & Sons	£160	0	0
Philips & Bisiker	138	0	0
G. JENNINGS (accepted)	116	0	0

MANCHESTER.

For Erection of St. Mark's Rectory, Manchester. Messrs. MACKMURDO, HORNBLLOWER & WALTERS, Architects, 20 Fitzroy Street, and Liverpool.

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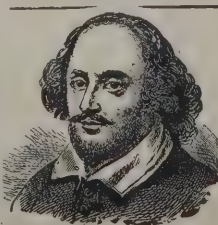
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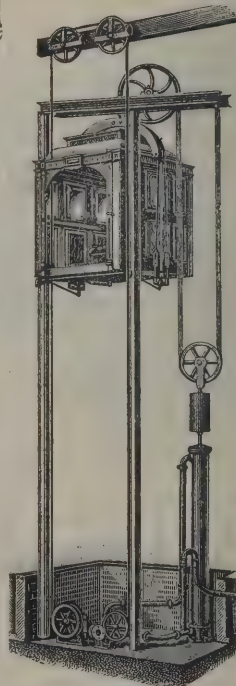
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Amended Estimates.

Jarvis	£1,297	0	0
Coxhead	1,212	0	0
A. Brown & Co.	1,105	10	0
Martin	1,050	0	0

SUTTON COLDFIELD.

For Improvement Works, New Road, Maney, Sutton Coldfield. Mr. C. F. MARSTON, Surveyor.

Jones & Fitzmaurice, Birmingham	£643	0	0
H. Holloway, Wolverhampton	587	0	0
Currall & Lewis, Birmingham	575	5	9
H. Law, Wolverhampton	499	3	10
J. BIGGS, Birmingham (accepted)	490	0	0
Engineer's estimate	567	14	3

WINWICK.

For Alterations at Winwick School, Northamptonshire. Mr. J. G. STALLEBRASS, Architect, North Street, Peterborough.

Howe, Oundle	£220	0	0
Coats & Son, Thrapston	215	0	0
Nichols, Peterborough	205	0	0
Guttridge, Peterborough	200	0	0
Shoperson, Peterborough	180	0	0
Kidd, Peterborough	177	10	5
BULLIMORE, Great Gidding (accepted)	176	7	6
Sharpe, Peterborough	175	5	6

WOOLWICH.

For Cottage, King Street, for Mr. D. Davis. Mr. H. H. CHURCH, Architect, Woolwich.

H. L. HOLLOWAY (accepted) £256 0 0

For Additions to the Duke of Connaught Coffee Tavern, New Road. Mr. H. H. CHURCH, Architect, Woolwich.

MULTON & WALLIS (accepted) £259 0 0

For Alterations to the Duke of Connaught Coffee Tavern, New Road, to meet the Requirements of the London County Council. Mr. H. H. CHURCH, Architect, Woolwich.

HODGIN (accepted) £145 10 0

WOOLWICH—continued.

For Engineering Works in Connection with Public Baths in Course of Erection for the Local Board of Health. Mr. H. H. CHURCH, Architect, Woolwich.

Steam Machinery and Fittings included.

Summerscales & Sons, Keighley	£5,733		
John Fraser & Son, Millwall	5,725		6,942
W. J. Fraser & Co., Commercial Road	5,225		6,447
Fraser & Fraser, Bromley-by-Bow	4,887		5,895
F. D. Berry & Sons, Westminster	4,795		5,820
H. Young & Co., Pimlico	4,760		5,800
J. & T. May, High Holborn	4,403		5,432
Jenkins & Son, Leamington Spa	4,306		5,414
Murdock & Cameron, Glasgow	4,215		5,159
Rosser & Russell, Charing Cross	3,996		5,000
Benham & Sons, Wigmore Street	3,944		4,831

For 1,400 Feet 15-inch Pipe Sewer for Waste Water from the Public Baths now in Course of Erection, for the Local Board of Health. Mr. H. H. CHURCH, Architect, William Street, Woolwich.

Brewer, Plumstead	£680	0	0
Girling, Woolwich	600	0	0
Brightmore, North Woolwich	539	10	0
RACKHAM & BENTHAM, Plumstead (accepted)	468	0	0

For Showrooms for Messrs. Birts & Sons, Russell Place, Greens End. Mr. H. H. CHURCH, Architect, Woolwich.

Balaam Brothers	£1,070	0	0
H. L. Holloway	1,060	0	0
Multon & Wallis	1,029	0	0
Chessum & Sons	996	0	0
Chapman	985	0	0
Tarrant	980	0	0
YOUNG & LONSDALE (accepted)	892	0	0

For Rebuilding the Duke of Wellington Tavern, William Street, for Mr. J. Prance. Mr. H. H. CHURCH, Architect, Woolwich.

Balaam Bros.	£3,153	0	0
Munday & Son	2,900	0	0
Chessum & Sons	2,750	0	0
Young & Lonsdale	2,728	0	0
Chapman	2,595	0	0
H. HOLLOWAY (accepted)	2,470	0	0

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WOOLWICH—*continued.*

For Rebuilding No. 60 Powis Street, for Mr. Robert Martin.

Mr. H. H. CHURCH, Architect, Woolwich.

Blake	£2,079	0	0
Reed & Son	1,625	0	0
Chapman	1,597	0	0
Chessum & Sons	1,520	0	0
H. L. Holloway	1,476	0	0
Tarrant	1,425	0	0
MULTON & WALLIS (<i>accepted</i>)	1,339	0	0

TRADE NOTES.

To facilitate the execution of orders and despatch of goods, Messrs. Hobbs, Hart & Co. have found it necessary to remove their clerical staff to the registered offices of the company, which are adjoining their works at Arlington Street, Islington, N. The premises at 76 Cheapside will still be retained, and the greatly increased showroom space will enable the company to keep a much larger assortment of samples of their various manufactures.

As recurrence of frost is not improbable, the following communication may be useful. It comes from Mr. Thomas R. Macquoid. He says:—"Two years ago, in the severe frost of 1890-91, I called the attention of the public, through the *Daily News*, to the advantage of covering the lead water-pipes in houses with 'silicate cotton'—a non-conductor of cold—to avoid the horrible discomfort of 'bursts' in severe frost. Having suffered, I had my pipes covered in this way throughout the house, except at one point difficult of access. All my pipes except at that unsilicated point have kept sound during the hard frost we have been having. This, it seems to me, is a 'proof positive' of the utility of the precaution, and I again advise householders, where there is risk of bursting pipes, to have them covered with 'silicate cotton.' It is not expensive, and it is easy of application." The material is supplied by Messrs. Frederick Jones & Co., of Perren Street, London, N.W.

We notice that Mr. G. Shrewsbury, patentee and manufacturer of the "Calda" instantaneous water-heater, &c., has removed from 36 Gray's Inn Road to new premises, viz. the "Calda" Works, Station Road, Camberwell, S.E., where all communications must be addressed. Mr. Shrewsbury has also issued a new catalogue of gas conservatory boilers, the "Calda" instantaneous water-heater for gas or oil, improved gas baths,

cooking and heating-stoves, &c., which will be sent on application.

We hear from Mr. Rashleigh Phipps that statements have been published in some newspapers that the company known as Roger Dawson, Limited, has been formed to acquire the business of Rashleigh Phipps & Dawson, and he informs us that under the terms of the dissolution between himself and Mr. Dawson, the deed provides that neither shall use the name of the other in any shape or form whatever, and that he is now carrying on business at No. 102 Oxford Street, W., under the style of Rashleigh Phipps & Co., electric-light engineers and contractors.

The Agricultural College, Aspatria, is being warmed and ventilated by means of Shorland's patent Manchester grates and inlet panels, the same being supplied by Mr. E. H. Shorland, of Manchester.

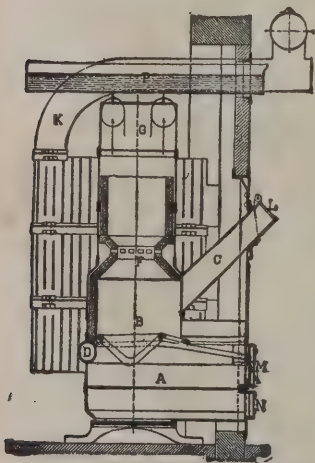
At the meeting of the Wetherby Sanitary Authority, it was resolved to accept the tender of Messrs. T. & W. Marston, Otley, for the general drainage work connected with the Wetherby drainage scheme. Mr. Preston, Bradford, is engineer to the scheme. The question of borrowing the sum of 5,500*l.* for the work was postponed for a fortnight.

At the meeting of the Edinburgh Association of Science and Arts Mr. Duncan Bell read a paper entitled "Windows," in which he called the attention of the Society to the merits of a double-casement window, which, he said, was the most perfect yet introduced.

The Sewerage Committee of the Aberdeen Town Council have accepted the offer of Mr. Gair, contractor, to construct a sewer in Queen's Road for 290*l.*; and the offer of Mr. R. M'Kay for a new sewer in the Woodside district for 400*l.*

The first number of a new periodical, *The Writing Machine News*, published by the Yost Typewriter Company, Limited, has just appeared with the new year, the European edition being published at 40 Holborn Viaduct, E.C. The object of the journal, it is stated, is to concentrate and bring before Yost operators, users and students of the Yost machine, managers and agents of the company, such information as is likely to be interesting and helpful to them. The Yost Company in America have already brought out a similar journal for distribution there and in Canada, and this has been found of great service to its readers, by whom it is highly appreciated.

Owing to the immense success of "Charley's Aunt" and the great demand for seats, Mr. Penley finds the limits of the



H. HEIM'S PATENT SMOKE-CONSUMING CALORIFER

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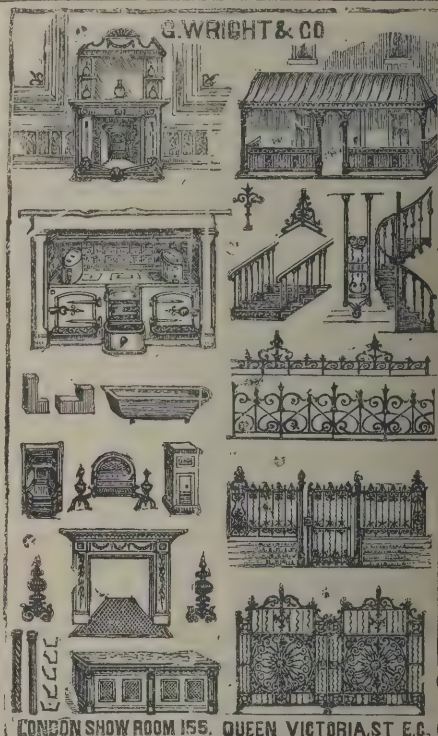
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"Burton Weir" Tile Panels and Hearths.

"THE GOLD MEDAL RANGE"
With Lifting Fire.

WORKS, ROTHERHAM. Estab. 1854.

Royalty Theatre totally inadequate, and has therefore secured the Globe, to which house he will transfer "Charley's Aunt" on Monday, January 30.

BUILDING AND BUILDERS.

THE annual meeting of the Nottingham Master Builders' Association was held on Friday night, the 13th inst., Mr. J. W. Woodsend presiding. The following were elected to serve for the ensuing year:—Mr. J. W. Woodsend was elected president; Mr. George Fish, vice-president; members of committee, Messrs. J. J. Adams, J. Cooper, T. Cuthbert, C. Dennett, H. C. Gilbert, Enoch Hind, Joseph Hodson, F. Messem, R. Simpson, Councillor J. Wright, James Wright and F. Wartnaby. In the annual report the committee expressed regret that the year had been marked by slackness of trade, and the difficulties further increased by the demands of the operatives for higher wages, but ultimately an amicable settlement was arrived at. The committee have under consideration the revision of the schedule of day-work prices, and they recommend that the general contract form sanctioned by the Royal Institute of British Architects should in future be the only approved basis of contracts for the district. The number of members is steadily increasing. Votes of thanks to past officers for their services and to the Chairman for presiding terminated the proceedings.

THE Crewe Town Council have decided to purchase the Foresters' Arms Hotel and an adjoining shop in Earle Street from the North Cheshire Brewery Company as a site for the new Municipal Buildings. It is proposed to build a technical school as well as Corporation offices.

A PAPER will be read by Mr. William Shepherd at the Institute of Builders (Incorporated), 31 Bedford Street, Strand, W.C., on Wednesday, January 25, entitled, "Building and Engineering Works for Public Authorities."

A BUILDER of Plymouth, Mr. J. W. Parson, has just given a dinner at the King's Arms Hotel to his employes and a few friends. After the removal of the cloth Mr. Light rose to propose a toast which he thought would be drunk by everyone present with a hearty goodwill. Mr. Parson was a good employer, and as they had been friends for a number of years he could speak from experience. Mr. Parson, on rising to reply, said it afforded him very great pleasure to meet them there that evening, as he believed such meetings tended to improve the good feeling between employers and men.

THE Harrogate Town Council have instructed the Wells and Baths Committee to appoint a surveyor to take out quantities and to obtain tenders for the proposed new Montpellier Baths, as designed by Messrs. Baggallay & Bristowe.

A SITE has been taken for another new distillery in Dufftown by an influential firm of Glasgow whisky merchants. Mr. Donald M'Kay, builder, Dufftown, will erect the new buildings.

THE Plans Committee of the Aberdeen Town Council have passed the plans for the enlargement of Trinity Hall. The plans were prepared by Messrs. Brown & Watt, architects. The new building is designed to harmonise with the existing Tudor style. The additional accommodation on the hall floor consists of a minor hall, capable of accommodating 100 persons. The work is to be proceeded with as soon as tenders have been received.

OPERATIONS are about to commence for the erection of a new police station for the southern district of Glasgow. A site has been secured at the corner of Nicholson Street and Oxford Street, and designs for the building have been prepared by Mr. A. B. M'Donald, the city engineer. It is estimated that the total cost will be about 25,000/., and it is expected that the new station will be ready for occupation in two years.

ELECTRICAL.

At the meeting of the Coventry City Council the consideration of the General Works Committee's report on the question of electric traction for the Coventry and district tramways, which had been adjourned from the meeting a month ago, was resumed. The system proposed by Mr. W. S. Graff Baker, the owner of the tramways, is that known as the Thompson-Houston overhead-wire system, and a short sample of the wiring has been erected in Hertford Street. The Mayor moved the adoption of the report, which recommended the Corporation "not to consent to such a system in Coventry under any circumstances whatever." He believed that before long a better system would be introduced. This motion was not carried, and the matter was referred back to the committee.

THE deputation of the Edinburgh Town Council, who lately visited several towns in England with the view of gaining information as to the system of electric lighting, have draughted their report, which is to be printed for final approval.

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THE New Romney Town Council have appointed a committee for the purpose of considering the expediency of lighting the town by means of electricity, the cost of gas being 5s. 10d. per 1,000 feet.

THE Heckmondwike Local Board decided at their meeting to advertise for an electrical engineer to carry out a scheme of lighting for the Board, the mover of the resolution expressing his belief that the scheme of Mr. Hutchinson, engineer, the adoption of which had been negatived, would not only be approved of when another engineer was called in, but would be commended.

The ceremony of turning on the current of the new installation of electric lighting in Hull has been performed. The station contains three boilers of the return tube pattern, made by Messrs. Davy, Paxman & Co., of Colchester. The water for these is supplied from the town mains, and passes through softeners into tanks, from which it is conveyed by feed pumps and injectors arranged in duplicate. By this means encrustation inside the boilers is reduced to a minimum. In the engine-room there two 200 and two 80 horse-power engines, each attached to a dynamo, from which a pressure of 110 volts will be obtained. When necessary, 115 to 120 volts will be got. The electric machines are made by Siemens Brothers. The street mines are laid under the footpaths, and generally consist of bare copper strips suspended and on insulators in little concrete tunnels. There are nearly three miles of culvert and pipes down, and the length of wire extends many miles. Messrs. Crompton & Co. have laid these mains. At night-time the station can be off and leave the batteries, the storage of which is in the upper floor, to supply the few lights which consumers keep burning at night. They are capable of supplying 900 lamps for one hour, or a proportionately less number for a longer time. The station at present is capable of supplying 4,500 16-candle power lamps.

VARIETIES.

THE Mersey Dock Board have decided to spend 40,500*l.* for providing additional accommodation at the Wallasey Foreign Animals Wharf.

A SCHEME for utilising the motive-power of the Rhone current at Bois Noir, near St. Maurice, has been devised by M. Barraud, engineer, Bex. He proposes to construct a flood gate and deviation canal furnishing a net motive-power of

13,000 horse-power. The cost of the undertaking is estimated at 1,800,000 francs.

MR. W. HOWARD SMITH, the city surveyor, Carlisle, is, the *Carlisle Journal* says, one of the "selected candidates" for the position of chief of the new department which the London County Council has established to carry out the large and important engineering and building works which they have in hand.

THE Stratford-on-Avon Rural Sanitary Authority have adopted a scheme of sewerage for Henley-in-Arden, for which they seek the approval of the Local Government Board and sanction to borrow 2,000*l.* to carry out the work.

THE medical officer, Dr. Hunt, in his report for 1892 to the Urban Sanitary Authority of Pudsey, says in regard of sewerage that there is no regular system. For the main part, the road sewers are of the old shallow, permeable, rubble, drain-sewer class. He desires especially to draw the attention of the Board to the urgent need for main sewerage that there is in the town. He also advocates that all the existing sanitary by-laws be revised and brought up to date, and that jerry-building be put down with a high hand, and without any fear or favour.

AT Cardiff a conference of representatives of the Severn Navigation mortgagees and of the Cardiff and Worcester Corporations has been held to consider the raising of 20,000*l.* for the alteration of Westgate Bridge, Gloucester, to a swing bridge, to allow of the better navigation of the Severn to the Midlands. A resolution in favour of altering the bridge, giving a clear head-room of 25 feet, was carried.

PLANS have been prepared for the Coventry City Council by Mr. James Mansergh for a sewage farm in the Avon Valley, with outfall sewer and other works, the estimated cost being 127,000*l.* It has been decided to take steps to acquire the land and carry out the work.

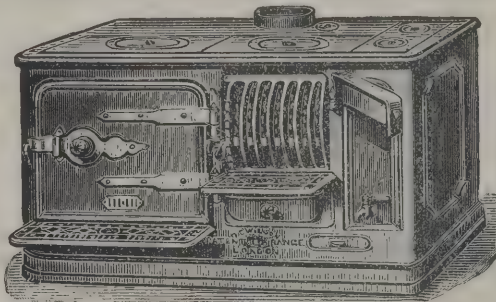
AT the meeting of the St. Pancras Vestry the names of the following six firms were brought up upon the recommendation of the General Purposes Committee for the appointment of quantity surveyors for the new Municipal Offices for the parish of St. Pancras, viz.:—Brunsden & Henderson, Corderoy & Farthing, Curtis & Sons, Gardiner, Son & Theobald, T. M. Rickman and Widnell & Trollope. On the final vote being taken the result was as follows:—Brunsden & Henderson, 46; Corderoy & Farthing, 30; T. M. Rickman, 6; and we understand Messrs. Brunsden & Henderson, surveyors, 47 Pall Mall, S.W., have accordingly been appointed for this work.

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than any others.

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Chief Office and Works:—Vauxhall Walk and Glasshouse Street, London, S.E.

AN inquiry has been held by the Local Government Board, at the Bradford Town Hall, into an application by the Town Council for sanction to borrow 33,753*l.*, money expended on the purchase of premises for street improvements already effected, and for sanction to borrow 15,000*l.* for other purchases during the next three years. Evidence was given as to the manner in which the 33,753*l.* had been expended, and the inquiry then concluded.

THE Bath Town Council at their meeting passed a resolution to the effect that the inconvenient and dangerous state of the present railway station was considered disgraceful to the city, and the Council hoped to receive an assurance of the speedy commencement of the work.

At the meeting of Greenock School Board, ex-Provost Campbell said he observed from the proposed Municipal Bill that powers were asked to borrow no less a sum than 145,833*l.*, and that practically no details were given of how it was to be expended. He thought the committee in charge of the matter should at once petition against the Bill.

WE hear that Messrs. Lumleys, of St. James's House, 22 St. James's Street, have for disposal a very fine building estate at Beaulieu, on the Mediterranean shores, a rapidly rising winter resort midway between Nice and Monte Carlo, and which bids fair to rival in popularity its better-known sisters on the Mediterranean littoral. The property in question is actually on the sea, and extends to some 30,000 square metres, and we understand it can be acquired at such a figure as should make it a very profitable speculation. It may be mentioned also that the property is about a mile from the Marquess of Salisbury's villa, La Bastide.

THE *Lincoln Chronicle* says:—The old wall to the north of the chapter-house, and that of the adjacent library staircase, which have been demolished in the last few days preparatory to the erection of a new staircase more in harmony with its present conspicuous position, have been found to contain a large number of exquisitely-worked architectural fragments. The greater part of these belong to the long-lost north walk of the cloister, consisting of window-tracery, mullions, capitals, &c., almost as fresh as the day they were first put up. Examination of the continuation of this wall at the back of the library proves that it contains similar fragments to a large extent, so that if the scheme for removing the library were carried into effect, the missing walk might be largely rebuilt with its original beautifully-carved stones. Some other fragments,

richly coloured with scarlet and azure, are shown by comparison with the existing work to have formed part of the original reredos.

THE LIABILITY OF SUB-CONTRACTORS.

A JUDGMENT has been issued by Sheriff Rutherford in an action for 100*l.* damages by John Balfour, engine-fitter, Lochee, near Dundee, against Messrs. Kinnear, Moodie & Co., builders and contractors, Iona Street, Edinburgh. On August 27 last, while on the public road between Dundee and Lochee, he was struck in passing under a railway bridge in course of alteration by a piece of iron or stone which fell from it and cut him on the head. The defendants were contractors with the Caledonian Railway Company for the alterations on the bridge, but they employed sub-contractors, and it was a squad employed by one of the latter that was working when the accident occurred. The Sheriff has decided that the defendants are not responsible for fault on the part of the sub-contractors or of any persons in their employment. He therefore finds for the defenders, with costs. In a note he says that defendants employed sub-contractors to produce a certain result, but they had no control over them with reference to the means by which that result was to be accomplished.

CARTAGE OF EXCAVATED MATERIAL.

IN excavations a contractor occasionally has the good fortune to strike upon a bed of sand or gravel which was not anticipated, and it rarely happens that he is not allowed to enjoy the whole advantage of the material. A case has occurred in Glasgow, and has given rise to litigation, which presents a rather novel claim that was founded on such a discovery. Mr. John Young obtained a contract for a section of the works on the Glasgow Central Railway, and in August 1890 he agreed with a firm of cartage contractors, named Young & Co., to carry material from the cuttings to a spoil-bank at the rate of 5*d.* per ton. Sand was found in 1891, and was sold by Mr. Young to builders, who removed it at their own expense and in their own carts. His cartage contractors claimed the monopoly of removing the stuff, but it was not allowed. In September 1891 a deep bed of sand was reached, and again the question arose whether Mr. Young was entitled to sell or store the sand without being bound to give Messrs. Young the cartage of it

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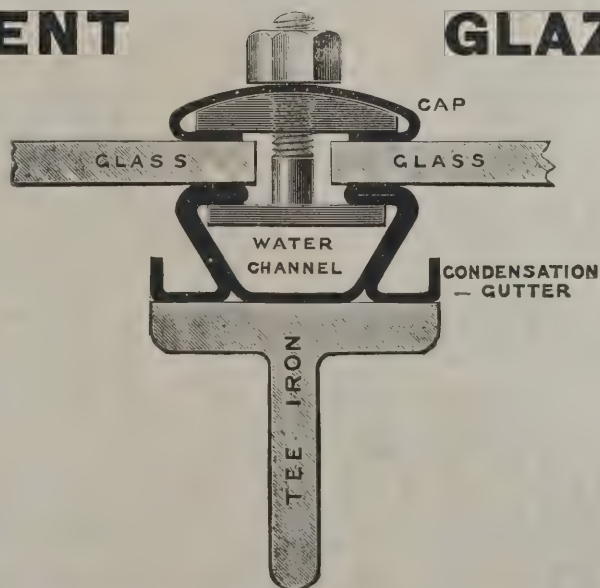
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They reasserted their claim to "the cartage of everything excavated." Mr. Young, while denying their right to this, proposed that they should cart all the sand that was intended for the store on time-payment, and when they refused he ordered off their carts and employed other carters. Messrs. Young thereupon brought an action for breach of contract, and claimed 1,500*l.* damages. Their agreement "to do the cartage of gravel, sand, &c., of the cutting of the new railway," it was maintained, gave them a right to remove all the material excavated. The Court decided against the carters. On appeal the judgment was upheld. It was laid down that there was nothing in the contract giving the plaintiffs right to the cartage of everything excavated, the contract rather being that they were to have the carting of what required to be carted, and that the defendant was the judge of the quantity. Scotch law does not correspond with what is followed in England. An English judge would be likely to arrive at an opposite decision. Apparently the intention of the parties was that the carters were to remove all the stuff from the cuttings, and if the sand, gravel, &c., caused extra inconvenience, the carters would have to take the risk. The discovery of the valuable beds of sand made the cartage unnecessary, for the purchasers used their own carts. But how could a general agreement be affected by a contingency that was not referred in any way?

CLAY, BRICKS AND BRICKMAKING.*

THE selection of a suitable clay is the first and most important step in the business of brick and tile making, the success of the business depending very greatly upon the selection made. A clay that will mix readily, dry and burn without cracking, uniting when burned, and forming a vitrified body, is much to be desired. It has often been remarked, and it is doubtless true, that there are no two samples of clay, taken from different clay beds, exactly alike. They may have the same colour and texture so far as we can judge, but yet they differ materially in some essential, though unknown, characteristics. Clay is a product of the decomposition of minerals largely aluminous in their composition. Such minerals must have been abundant in the early stages of geological formation.

* A paper by Mr. E. Parry, read before the Victorian Architectural and Engineering Association, and published in the *Australasian Builder*.

They entered largely into the composition of the great masses of granite rock, which by its disintegration or decomposition has furnished very much of the material of which all clay banks are made up. And as the rock in different localities would most probably be under different conditions of formation, so its composition and properties would vary, and hence the difference in apparently similar clays. Although there is some difference of opinion as to its chemical relation, we all know that water plays an important part in the practical adaptation of clay to its various uses. Acids will not displace it, nor will temperature below red heat disturb it. But above that point the clay becomes permanently hard, nor is it possible by any known process to replace the lost water and with it restore the plastic character of the clay. Let us now briefly consider the different varieties of clay.

Pure clays are those belonging to the coal measures. Nearly every bed of coal rests on what miners call "fire-clay." Some of these clays when found and brought to the surface are of a stony consistence, others are of a plastic nature. As a rule these clays have a light blue colour, caused by the dye from the coal, but become white on being kilned or burned, the carbon which gives the colour having been dissipated. Although the clay-beds differ very materially in appearance and composition we usually find the purest clays underlying the lowest coal seams. Yet these clays are not always free from impurities. In some districts soda in considerable quantities is found mixed with the clay; sometimes potash, rendering the clay fusible under a high heat and, therefore, unfit for either fire-bricks or terra cotta. It must also be mentioned that beds of clay suitable for fire-bricks and terra cotta are often found near the surface. In several parts of Victoria excellent clay has been found from which fire lumps and bricks have been made equal to those imported. Briefly, we have the Post Tertiary clays, or those connected with drift formation, and the alluvial or more recent origin. Drift clays are composed of two groups:—1. The tuff or lower blue. 2. The clays of the glacial period proper. These clays are found between rocks or resting on boulders and having gravel dispersed between them. An observer will notice this clay in railway cuttings, where the strata can easily be traced; and in slips where the clay will be found mixed with pebbles. This clay is generally mixed with fine sand, and sometimes a stratum of sand from one to four inches thick will be found running through it. The second of this group of clays consists of material washed from the last named by torrents of



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water. From exposure to atmospheric influence the iron of these clays has been partially oxidised, and its blue colour changed to a dark yellow or light brown, which becomes a bright red when thoroughly burned. The third clay of alluvial or more recent origin is caused by the back-water of large streams arresting the muddy water of the smaller tributaries that comes down from the hills loaded with fine particles of clay.

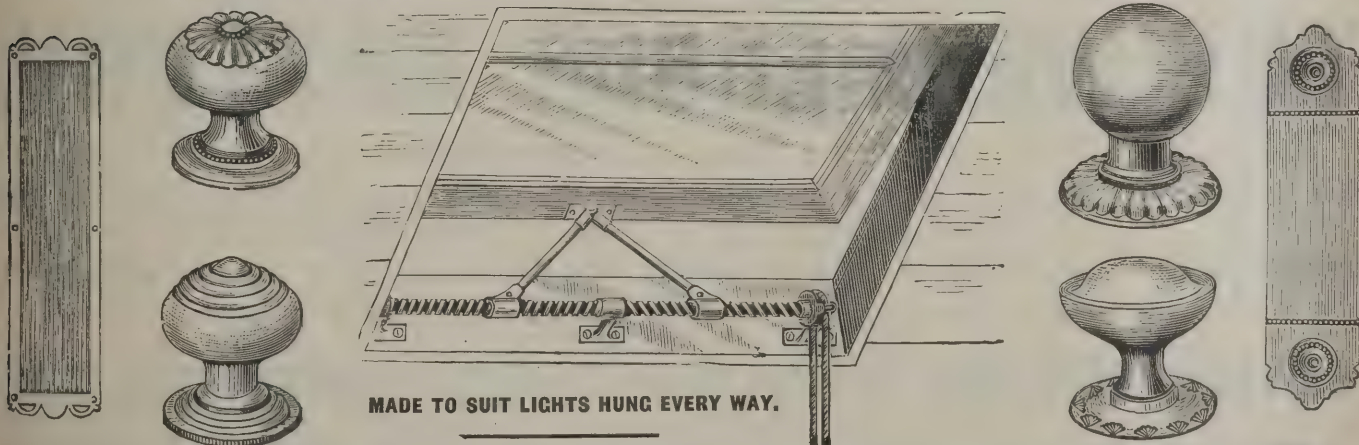
We have seen, then, that extensive beds of clay exist in various parts of the world of diverse varied qualities. As the rocks which produce clay differ from one another in density, colour, quality and usefulness for various purposes, Webster's definition of clay may be quoted here, being short and to the purpose: "Clay is a soft earth which is plastic or may be moulded with the hands. It consists of alumina, the characterising ingredient to which it owes its plasticity, and silica with water; it is the result of the wearing down and decomposition, import of rocks containing aluminous material, such as granite, &c.; lime, magnesia, oxide of iron, and other ingredients are often present."

Turning our attention now to the subject of bricks and brick-making, we have enough evidence from recent discoveries in Rome, Egypt and other countries to prove that both brick and terra-cotta were made and largely used at a very early period in the history of the human race. Both burned and unburned bricks were employed in the construction of the Great Wall of China. This wall, one of the most remarkable fortifications ever erected by human hands, employed millions of men for the space of ten years in its construction, and was completed in the year 211 B.C. Its length was about 1,250 miles, the height averaging about 22 feet. Our most recent works of any note in which bricks were employed are the Thames Tunnel and the Great Western Railway tunnel under the river Severn. In the former 75,000,000 bricks were used. I sincerely wish that some similar work had to be constructed in Victoria, though I am afraid that if such were the case the authorities in their combined wisdom and sagacity would paralyse our hopes and expectations by preferring concrete to a colonially made brick. The commonest and worst bricks that have ever come under my observation were those made in London. This is not only caused by the nature of the clay used, but by the foolish use of ashes, and other objectionable ingredients, such as animal and vegetable matter, that are used; while from the mode of burning we can imagine—and some of us call to mind—the

intolerable and overpowering stench that the authorities seem to take such delight in, for the existence of such proceedings is a standing disgrace to any community that pretends to make health laws, and could only exist by the wicked connivance of those who possess the power of having the same removed. Our cousin, the American, naturally claims the honour of making the best brick—a brick that, like everything else American, is calculated to "lick creation"; but, in my humble opinion, the Staffordshire Blue or the Welsh Metallic takes the palm for strength and durability—(Staffordshire bricks 654 tons square feet, Welsh Metallic 1,056 square feet)—while Australia can lay claim to making a common building brick that will compare very favourably with our home products of similar nature; especially can this claim be made as regards the price—a not unimportant consideration at this time, or, in fact, at any time. Notwithstanding this fact, brickmakers do not receive that support that should be accorded them. They are, therefore, obliged to cut down prices so severely that disappointment to both maker and architect is too often the inevitable result—25s. per 1,000 for the best machine-made bricks is, at the same time, an absurdity and a disgrace.

What is most demanded in the use of brick, stone, or other material employed in the erection of buildings is:—1. A minimum of weight with the maximum of strength. 2. That the material used shall be unaffected by damp, cold, or heat, according to the variations of the atmosphere. 3. Durability, which can only be secured by the clay, or other leading constituent of the material, being perfectly calcined. Many so-called "hollow bricks" have been made, but they have, while securing a decrease of weight for economy in carriage, been but hollow mockeries and empty delusions, for in proportion to the cavities made in the brick, the resisting power has been reduced, and therefore weakened. In fact, after a part of the core, however small, has been taken out it has been impossible to put the brick through the hand or steam press, either of which would inevitably destroy the cavities. For this reason these bricks have had no closed ends and are thus useless where headers are necessary to complete the bond in courses. Many attempts have been made to bring this class of brick into general use in many parts of England, but up to the present without any success. We also have the wire-cut brick, which name I must admit is somewhat vague. The clay on being brought from the pit is either passed through rollers or perforated into the pug-mill, and from thence is forced, in the form of a continuous band of

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about 9 inches wide, on to the cutting table, where by a hand-cutting machine having wire cutters it is sliced into sizes suitable for bricks. If the clay is strong, fair bricks can be made, but, on the whole, they are far from being satisfactory, as there is a tendency to twist in the process of drying and burning. Now let me say a few words upon the dry and semi-plastic bricks. Both these are made in Victoria, with a fair amount of success. The plastic process is the best for our clays, and gives by far the best results both in strength and colour, and bricks made by this process may be relied upon for durability, and are not affected by the many changes of climate.

I have been very much disappointed at seeing our best bricks, after being produced at great care and expense, in so many instances being covered over with plaster, for, to my mind, it shows bad judgment and still worse taste to prefer dismal stucco and crumbling plaster to the honest and straightforward countenance of a brick. This strange preference for plaster seems to me somewhat indicative of a discreditable shame for what is real and a love for the unreal. In other words, many would readily infer, from numbers of our public and other buildings, that the god we worship is the god of mere appearance, and that we are ashamed of our real selves. But there is comfort in this reflection that, if buildings indicate national traits, then underneath the show of stucco and plaster there is to be found good, substantial and honest brick.

That bricks are being viewed as ornament as well as objects of use is becoming more and more evident every day. The constantly increasing use of brick and terra cotta, says a New York writer, is "doing wonderful work for our once monotonous streets. The breaking up of the solid brown stone blocks, particularly on the avenues, lamentable as it is in some respects, since it is for building purposes, still has done much in this way. But the brick gives life and colour to a town which, taken in connection with more picturesque architecture, is making some areas to blossom like the rose, so to speak." The fashion of the day is architecture in the so-called Queen Anne, an attractive style, and one which certainly gives colour and picturesqueness to a street when honest red brick is employed instead of sham plaster or a thin and stingy veneering. "I go so far," says Mr. R. W. Edis, in the "Journal of the Society of Arts," "as to say that the man who builds a red brick house in town where want of colour tends to make everything glaring, or when smoke-coloured, gloomy, is a benefactor to his species." No materials are more suitable to the smoke

and deleterious action of the atmosphere of all great cities than building materials of clay. Warmth of colour and picturesqueness may both be obtained by the use of the numberless shades of red brick, whilst this range of colour may be greatly enlarged by the use of glazed and enamelled bricks, which, with the terra-cotta faience, admit of almost any variety of designs. The building world is happily finding out, at length, the value of clay building materials for durability as well as ornament; and American metropolitan streets promise to be in the near future more picturesque and beautiful in colour than ever before, with terra-cotta in its various shades, hard and glazed bricks, tile, &c., which every shower of rain will wash and clean and improve, and which will be bright and clean and beautiful when the sham fronts of stucco and veneering are ragged and ugly with age and decay.

Brickwork is acknowledged to be (except by some of our learned City Fathers) the best material for sewers and culverts, as earthenware is for drain-pipes. Perhaps the time will come, and we sincerely hope it is not far distant, when our gas and water mains will be of the same material. The ordinary spigot and faucet joint, properly bedded in cement, can be made both air and water tight, and if a screw joint were preferred it could be used with perfect safety. The chief advantages about earthenware for pipes of every description are that its glazed surface renders it non-absorbent, and favourable to the passage of water or soil, and also that it is absolutely non-corrosive. If our Metropolitan Board of Works could only be induced to use salt glazed bricks for the lining of the main sewers in our city, they would find that there would be neither fungus growth nor wear caused by the rush of water.

In many towns in England bricks have been employed for paving streets and footpaths, and the outlay has been acknowledged to be much below that of flagstone. Red bricks impart a very agreeable colour, and other tints might be used so as to form an agreeable pattern at a very slight expense. They can be cheaply and rapidly renewed when necessary, small portions of a footway being repaired at a time, so that traffic is not interrupted for long periods.

Ornamental bricks, in addition to being produced in the ordinary red colour, can also be manufactured in caustic colours, as buff, brown, chocolate brown, black, &c., and can also be enamelled in any desired hue, such as red, yellow, blue, green, &c. For ornamental bricks having caustic colours, the colouring oxides are mixed with the clay in quantities usually of 7 to 10 per cent. The colouring oxides act as fluxes, and

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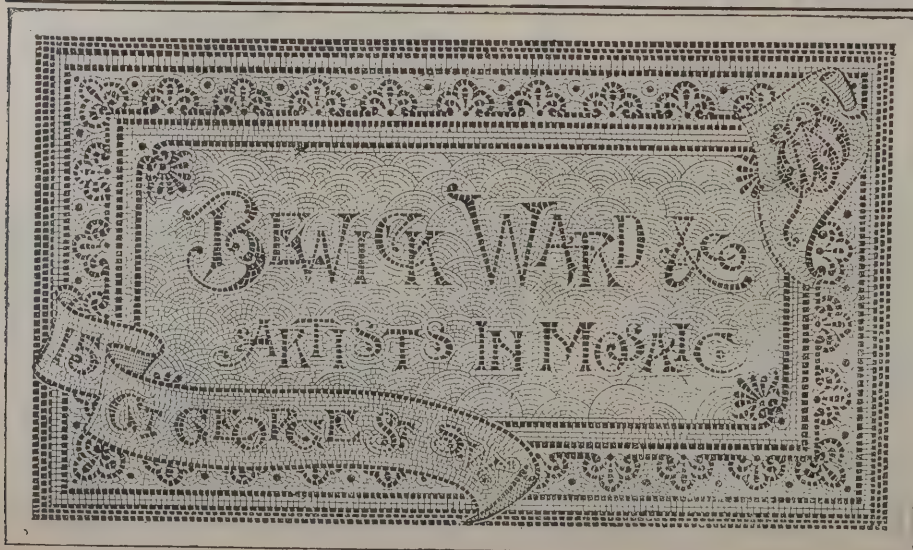
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the composition of the body must be altered in some cases to counteract this. Ornamental bricks, like the ordinary pressed brick, are sometimes also coloured under the glaze.

GLASGOW FIRES IN 1892.

THE inspector of fires for Glasgow has just issued the annual report for the year ending December 31 last. The fire calls received and responded to were 591, while the brigade also attended 108 false alarms of fire. 577 of the fires were within and 14 beyond the municipal area. Engines and firemen were present at 370 of the fires within the city, but in 221 cases the outbreaks were of such a trifling character that firemen with hand-pumps only were sent out. While many of the city fires were of a sharp nature, and required the presence of a strong force of men and plant, yet only two of them have resulted in serious loss; these were the general workshop and warehouse buildings, 66 Mitchell Street, and Messrs. Hamilton, Caldwell & Co.'s Leather Currying Works, Boden Street, Bridgeton. The fires of 1892 show an increase of 56 in number as compared with the preceding year; but as 62 of the fires occurred in the districts included within the city in November, 1891, those within the old area show an increase of 24 over last year. The calls for services of the brigade outwith the city have diminished from 35 in 1891 to 14 in the year now reported on; but this also is in a large measure due to the extension of the city, as many of what were formerly "country fires" are now included in those of the enlarged city. Contacts on the line wires of street alarm system caused 8 false alarms, 76 were the result of mistaken judgment on the part of those ringing up the brigade, while in 24 instances the street-alarms were rung maliciously. Of the 577 city fires, no less than 203 were due to defective vents, flues, &c., and to timber under hearths. The average loss per fire within the city for three periods of five years, ending respectively with and including the years 1882, 1887 and 1892, may be worthy of passing notice. The loss for the first period was 243*l.* 18*s.*; for the second, 324*l.* 12*s.*; and for the third, 268*l.* 16*s.*; while the average loss per fire last year was 207*l.* 19*s.* 5*d.* The new stations at Mary Hill and Springburn are well advanced, and are expected to be ready for occupation early next summer. The central station is not suitable either for expeditious turning out or for the maintenance of proper supervision and discipline of the force stationed there. The house accommodation for the majority of the

members of the staff is very unsatisfactory. The locality is not one that would now be selected. As the most important work of the department lies in the centre of the city, it is desirable that the station should be so situated as to afford ready egress for the brigade, and so arranged and equipped as to make the work of the department attain a higher degree of efficiency than is attainable in the present station. The engines, hose-carriages and all other plant have been maintained in a thoroughly efficient state, and 2 hose carriages, with the necessary ladders, and 2 general purposes carriages, have been built by the staff; while three new steam fire-engines and 2 escapes have been acquired by purchase and added to the plant of the department. One of the steamers is to replace one purchased twenty-two years ago, which has been disposed of as unfit for service. 452 new fire-cocks and 32 new valve hydrants have been attached to the mains, these principally in the districts recently added to the city.

GRANITE INDUSTRY IN SCOTLAND.

THE Aberdeen *Free Press* gave a report of the annual social meeting of employes of the Great North of Scotland Granite Company, lately held in Prince Street Hall, Peterhead. Mr. W. Martin presided, and in the course of a short address said he thought it appropriate, if anything was to be said on that occasion, that it should be in regard to their work. As they were all aware, the work had been kept going very decently all the year. He did not think that they had anything to complain of as compared with others—in fact, nothing to complain of at all—in respect of being able to keep all hands employed. He was pleased to say that in that respect they were only in the same position as those of their own trade in Aberdeen. Wages, as they knew, had kept up; they had not risen, but they had not decreased. He did not know if the profits had been keeping up. He was looking forward to having a few days' work in order to find if the profits had been keeping up; but as he knew prices had been falling he was a little afraid of the result. However, he did not look forward to anything in the shape of a calamity; he had no doubt the company would be able to set the men agoing again at the beginning of the year, and he hoped to keep them going throughout the year. A year ago, about this time, they of the granite trade were talking of the M'Kinley tariff, which they were very much afraid would seriously affect the granite trade in Scotland. It was exceed-

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ingly gratifying to say now, after a year's experience, that the trade had not been seriously affected. In spite of the enormous duty the Americans still bought from Scotland, and in larger quantities than ever. The output of granite from Aberdeen to America had been larger during 1892 than in any previous year, with the exception of the year when the M'Kinley tariff was looked forward to, when a special effort was made to take in quantities at the old price. The main reason for the trade having kept up—although that was not perhaps such a gratifying feature of the year's trade—was that foreign granite had been coming into very general use in America. They could not now take the Aberdeen grey granite across to America and pay the high tariff. Swedish and Norwegian granites were now worked largely in Aberdeen, the quantity worked there for the year being valued at between 7,000*l.* and 8,000*l.*, which was just about the value of the granite that passed over the Great North of Scotland Railway. The probability was that that trade would increase if the workmanship was kept up to a good standard; but there was a danger of it being sent to America in the rough state and worked there. That was a matter with which they as granite workers had to do. Peterhead, of course, did not touch the foreign granite, but they did not know what might happen. He was confident, however, that so long as Scotch workmen kept turning out a first-rate article the granite would be worked in Scotland; but if they did not keep on improving as years went on, he feared very much that the Scotch working of foreign granite would pass away. They had it in their own hands, and their young men should see that they learned their business in the most thorough way, so that they would be able to compete with any workmen in the world. If Scotchmen did not keep to the forefront as artisans the time was not far distant when the granite trade would be over; but if they kept their work well up there was very little fear but they would be able to maintain their trade. There was no immediate fear, and he had no doubt but that Scotchmen would rise to the occasion, and fit themselves to compete with Yankees, Germans, Norwegians or anybody. He hoped and he believed also that the employers would not be behind in the way of enterprise, so that they would be enabled to keep the granite-working trade in the district in which it had been brought to such perfection. There was a danger which threatened them in Peterhead, particularly if the Great North of Scotland Railway Company brought their branch line from Ellon to Boddam, and came no further, they would be placed at a very considerable disadvan-

tage. At present the Aberdeen people with whom they had to compete and they were on the same footing. They all took the granite from the same quarries. They in Peterhead, of course, worked it first, but they got no advantage of that because of the high rate they had to pay for carriage of the polished material. If this new railway were brought to Boddam the Aberdeen people would be able to save both in cartage and carriage, and they in Peterhead would thus be placed at a disadvantage. But if they were placed at this disadvantage they had got to equalise it, and as they would have a year at least to think about it, he did not think they should let themselves be put behind without a struggle. They might be all called upon to co-operate with the management, but he hoped and thought that they would be able to carry on in spite of the railway. If, however, the railway came to Peterhead, as it was to be hoped in the interest of the town it would, then they of the granite works would be as well off as they were before.

DR. E. FRANKLAND ON GASLIGHTING.*

DR. EDWARD FRANKLAND, whose researches were made first in the laboratories of Playfair, Bunsen, and Liebig, and afterwards at Queenwood, Owens College, St. Bartholomew's, the Royal Institution, and the Royal College of Chemistry, has left, in the same way that Davy did, his stamp upon all he attempted. Whether working upon the isolation and identification of the radicles of which organic compounds are built up, and the evolution from them of new and unknown compounds, or employed upon the more practical investigations on water, sewage and gas, with which his name is so closely identified, or in his studies on physical science, which served to make still pleasanter his vacations, Frankland threw into the researches his heart and soul, and has given us a record of work which is remarkable for the way in which he has not only disclosed to us new facts, but has attempted in every case to discover the principles underlying them.

In the August of 1859, Dr. Frankland, in company with Professor Tyndall, undertook an ascent of Mont Blanc, with the object of establishing thermometric stations between Chamouni and the summit of the mountain, and, at the same time, seized the opportunity of trying some experiments on the

* A Cantor Lecture on the Generation of Light from Coal Gas. By Professor Vivian B. Lewes. Delivered at the Society of Arts.

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rates of the combustion of candles at high altitudes, in order to verify the accuracy of a statement made by Le Conte, that "the process of combustion is retarded by diminution of the density of the air, whilst it is accelerated by its condensation."

Burning six candles for one hour at Chamouni, Dr. Frankland carefully noted the loss of weight for each, and again repeated the experiment for one hour on the summit of Mont Blanc. The average diminution in weight for each candle was 0.4 grams per hour when burnt at Chamouni and 0.2 when burnt on the summit of the mountain; and the close agreement of these results, under such widely differing circumstances, naturally suggested to his mind that the rate of burning of substances which require the oxygen of the air to support their combustion is entirely independent of the density of the atmosphere. Whilst watching the burning of the candles in the tent which had been erected on the summit of the mountain, Dr. Frankland was struck by the small amount of light which they emitted, and the way in which the non-luminous zone of the flame had extended its proportions to the detriment of the luminous zone. Later on in the year Dr. Frankland repeated these experiments under conditions which allowed of photometric measurement of the amount of light given by the candles under diminished pressure, and the results are best given in his own words:—

The result proved that a great reduction in illuminating effect ensues when a candle is transferred from air at the ordinary atmospheric pressure to rarefied air. At the same time remarkable changes in appearance occur in the flame itself, especially at high degrees of rarefaction. During the diminution of pressure down to half an atmosphere the chief alteration is the gradual invasion of the upper and luminous portion of the flame by the lower blue and non-luminous part. As the pressure sinks towards ten inches of mercury the retreat of the luminous portion of the flame towards the apex goes on uninterruptedly; but the shape and colour of the flame also begin to undergo very remarkable alterations—the summit becomes more and more rounded until at ten inches pressure the flame assumes nearly the form of an ellipse, while the blue portion, which now comprises nearly the whole flame, acquires a peculiar greenish tint. Finally, at six inches pressure, the last trace of yellow disappears from the summit of the flame, leaving an almost perfect globe of the peculiar greenish-blue tint above-mentioned. Just before the disappearance of the yellow portion of the flame there comes into view a splendid halo of pinkish light, forming a shell half an inch thick around the blue-green nucleus, and thus greatly enlarging the dimensions of the visible flame. The colour of this luminous shell closely resembles that first noted by Gassiot in the stratified electrical discharge passing through a nearly

vacuous tube containing a minute trace of nitrogen. The colour thus imparted to the electrical discharge undoubtedly constitutes the most delicate test of the presence of nitrogen. In both cases I believe the coloured light to be due to incandescent nitrogen. In attempting photometrical determinations with candles, it was found that, owing to the irregularities of combustion, no satisfactory quantitative experiments could be made in artificially rarefied air. Oil-lamps also proved equally unsuitable, owing to the gradual ascent of the base of the flame towards the apex of the wick, by which the size of the flame and the hourly consumption of the oil were greatly diminished. Recourse was therefore made to coal gas, which, although liable to certain minor disturbing influences, yet yielded results, during an extensive series of experiments, exhibiting sufficient uniformity to render them worthy of confidence.

From the results of these experiments Dr. Frankland deduced the following important law:—

Of 100 units of light emitted by a gas flame burning in air at a pressure of 30 inches of mercury, 5.1 units are extinguished by each diminution of one mercurial inch of atmospheric pressure, or, more generally, the diminution in illuminating power is directly proportional to the diminution in atmospheric pressure.

As a natural sequence to these experiments, he made a second series upon the effects of compressed air upon the luminosity of similar flames.

At the very outset of this part of the inquiry considerable difficulties presented themselves, since it became necessary to abandon a gaseous combustible, which could not be compressed to the necessary degree and then delivered at a uniform pressure through a burner without very complex apparatus. I was thus compelled to resort to solid or liquid combustibles, the irregularities of which were still further increased by the space within the combustion chamber being necessarily more confined, in order that its walls might the better sustain high pressures. These difficulties in the way of accurate determinations, however, were by no means the most formidable, for it was soon found that any considerable increase of atmospheric pressure caused both candle and oil-flames to throw off large quantities of fuliginous matter, the formation of which could not be prevented by any amount of draught that could be established in the chimney of the apparatus. Hence, although the luminosity of the flames was greatly increased, yet it was obviously much less so than would have been the case under conditions of more perfect combustion. In fact, it soon became evident that the determination of increase of luminosity by compression must be made in a manner precisely the reverse of that employed for the corresponding determinations in rarefied air, for, whilst in the latter case the experiments were made with flames which, at ordinary atmospheric pressure, were saturated with luminous

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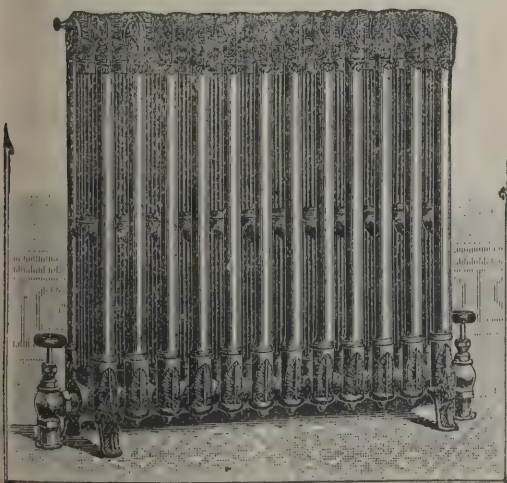
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matter, in the former it was found necessary to commence with flames which were very feebly, or not at all, luminous at common pressures. Such is the effect of compressed air in determining the precipitation of carbon particles within the flame, that a small alcohol lamp which at the ordinary pressure burnt with a pure blue flame became highly luminous when placed under a pressure of four atmospheres, and it can scarcely be doubted that, at a pressure of five or six atmospheres, its luminosity would be equal to that of sperm oil burning at atmospheric pressure. Owing to these difficulties, I have only been able to obtain satisfactory determinations between one and two atmospheres. In these determinations the lamp was supplied with amyl alcohol, a liquid which, whilst affording an appreciable amount of light in the experimental flame under one atmospheric pressure, was found to burn under two atmospheres without smoke, although at a somewhat higher pressure it began to evolve fuliginous matter.

The results of the experiments approximate to those calculated from the law given for pressures less than that of the atmosphere, but when continued to still higher pressures results were obtained which differed very widely from those one would have expected. In discussing the probable causes of these and other slight variations from the law, Dr. Frankland says:—

The luminosity of the flames generally used for artificial light emanates from two sources, viz., first from the ignition of minute particles of carbon floating in the shell of the flame, and, secondly, from the incandescence of gaseous matters. The latter source of illumination probably does not furnish more than 1 per cent. of the total amount of light, consequently nearly the whole of the light given out by flames under ordinary circumstances is due, as Davy first pointed out, to the ignition of solid carbonaceous matter.

This shows that at this time (1861) his views on the cause of luminosity in flame were in accord with Davy's, and he finally sums up the influence of atmospheric pressure upon the combustion as follows:—

1. The rate of burning of candles and other similar combustibles, whose flame depends upon the volatilisation and ignition of combustible matter in contact with atmospheric air, is not perceptibly affected by the pressure of the supporting medium.

2. The luminosity of ordinary flames depends upon the pressure of the supporting medium, and, between certain limits, the diminution in illuminating power is directly proportional to the diminution in atmospheric pressure.

3. The variation in the illuminating power of flame by alterations in the pressure of the supporting medium depends chiefly, if

not entirely, upon the ready access of atmospheric oxygen to, or its comparative exclusion from, the interior of the flame.

4. Down to a certain limit, the more rarefied the atmosphere in which flame burns, the more perfect is the combustion.

It was in the June of 1861 that Frankland contributed these important observations to the Royal Society, and seven years later he published a still more important communication in their "Proceedings"—a paper in which he shows that flames like those of hydrogen or carbon monoxide in oxygen, which cannot possibly contain solid matter, yet can be made to emit light when burning under sufficiently high pressure. In this paper, which was read on June 11, 1868, he says:—

Further experiments, made more than a year ago, on the nature of the luminous agent in a coal-gas flame, led me to doubt the correctness of the commonly received theory first propounded by Sir Humphry Davy, that the light of a gas flame, and of luminous flames in general, is due to the presence of solid particles. In reference to gas and candle flames, it is now well known that the fuliginous matter produced when a piece of wire gauze is depressed upon such flames, and the sooty deposit which coats a piece of white porcelain placed in a similar position, are not pure carbon, but contain hydrogen, which is only completely got rid of by prolonged exposure to a white heat in an atmosphere of chlorine. On pursuing the subject further, I found that there are many flames possessing a high degree of luminosity which cannot possibly contain solid particles. Thus the flame of metal arsenic burning in oxygen emits a remarkably intense white light, and as metal arsenic volatilises at 180 deg. C., and its product of combustion—arsenious anhydride—at 218 deg. C., whilst the temperature of incandescence of solids is at least 500 deg. C., it is obviously impossible here to assume the presence of ignited solid particles in the flame. Again, if carbonic disulphide vapour be made to burn in oxygen, or oxygen in carbonic disulphide vapour, an almost insupportably brilliant light is the result. Now fuliginous matter is never present in any part of this flame, and the boiling point of sulphur, 440 deg. C., is below the temperature of incandescence, so that the assumption of solid particles in the flame is here also inadmissible. If the last experiment be varied by the substitution of nitric oxide gas for oxygen, the result is still the same, and the dazzling light produced by the combustion of these compounds is also so rich in the more refrangible rays, that it has been employed in taking instantaneous photographs, and for exhibiting the phenomena of fluorescence. Many other cases of the production of brilliant light from incandescent, gaseous, or vaporous matter might be cited, but I will mention only one other. Amongst the chemical reactions celebrated for the production of dazzling light, there are few which surpass the active combustion of phosphorus in oxygen. Now, phosphoric anhydride, the product of this combustion, is volatile at a red heat, and it is therefore manifestly impossible that this substance

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should exist in the solid form at the temperature of the phosphorus flame, which far transcends the melting point of platinum. For these reasons, I consider that incandescent particles of carbon are not the source of light in gas and candle flame, but that the luminosity of these flames is due to radiations from dense but transparent hydrocarbon vapours. As a further generalisation from the experiment above-mentioned, I was led to the conclusion that dense gases and vapours become luminous at much lower temperatures than aeriform fluids of comparatively low specific gravity, and that this result is, to a great extent, if not altogether, independent of the nature of the gas or vapour, inasmuch as I found that gases of low density, which are not luminous at a given temperature when burnt under common atmospheric pressure, become so when they are simultaneously compressed. Thus, mixtures of hydrogen and carbonic oxide with oxygen emit but little light when they are burnt or exploded in free air, but exhibit intense luminosity when exploded in closed glass vessels, so as to prevent their expansion at the moment of combustion. I have recently extended these experiments to the combustion of jets of hydrogen and carbonic oxide in oxygen under a pressure gradually increasing to twenty atmospheres. These experiments were conducted in a strong iron vessel, furnished with a thick plate of glass of sufficient size to permit of the optical examination of the flame. The results are so remarkable that, although still far from being complete, I venture to communicate them to the Royal Society before the close of the session. The appearance of a jet of hydrogen burning in oxygen under the ordinary atmospheric pressure is too well known to need description. On increasing the pressure to two atmospheres, the previously feeble luminosity is very visibly augmented, whilst at ten atmospheres pressure the light emitted by a jet about one inch long is amply sufficient to enable the observer to read a newspaper at a distance of 2 feet from the flame, and this without any reflecting surface behind the flame. Examined by the spectroscope, the spectrum of this flame is bright and perfectly continuous from red to violet. With a higher initial luminosity the flame of carbonic oxide in oxygen becomes much more luminous at a pressure of ten atmospheres than a flame of hydrogen of the same size and burning under the same pressure. The spectrum of carbonic oxide burning in air is well known to be continuous; burnt in oxygen under a pressure of fourteen atmospheres, the spectrum of the flame is very brilliant and perfectly continuous.

This paper, striking, as it did, at the root of the fundamental ideas existing as to the causes of luminosity in flame, caused a profound sensation, and it was not long before the interest taken in it was made manifest by criticisms and attacks upon the new theory put forward. One of the first of these was by W. Stein ("Journal für pract. Chemie," 2, viii. 401), who, in criticising the various points in Frankland's paper with regard to the observation that the soot deposited from a luminous

flame is not pure carbon, but contains hydrogen, points out that:—

The first objection to this is that, as is well known, not only do all heavy hydrocarbons decompose with deposition of carbon at a high temperature in absence of air, but even marsh gas itself does so. Since now the hydrocarbons, whose vapours are supposed to produce the luminosity, are under such conditions before they are reached by the oxygen of the air, it cannot be doubted that they must undergo a decomposition in the luminous part of flames into carbon and hydrogen. Whether the separated carbon is chemically pure, or whether it is mixed with a body containing hydrogen, is of slight importance, since the chief question with which we are concerned is whether the soot is present in the flame as vapour or in the solid state. If it were a conglomerate of the densest light-producing hydrocarbons, whose vapours condense on the cold body, then it must, when strongly enough heated in absence of air, again be vaporised. This, however, is not the case, as everyone will find who tries the experiment. Moreover, its chemical composition is just as little favourable to Frankland's view. This will presumably vary according to the different luminous material from which the soot is obtained, and also according to the position in the flame from which it is taken. For the temperature of flame is, as is well known, different at different points, and, as known from the researches of Magnus, at lower temperatures, in addition to carbon, a tarry product containing hydrogen separates from the hydrocarbon. The soot of which I give an analysis below was collected from a gas-flame by sinking the bottom of a small silver kettle filled with water 2 to 3 millimetres deep into the flame. Benzine extracted from it traces of a solid yellow body, which, on account of its small quantity, could not be further examined. Nothing was extracted by alcohol, alcoholic potash, and dilute sulphuric acid. After careful and continued washing with boiling water and drying at 130 deg., 0.206 gave 0.6985 carbonic acid, 0.0195 water, 0.0020 ash. This amounts to:—

		On ash-free substance.
Carbon . . .	96.446 per cent.	97.390 per cent.
Hydrogen . . .	1.051 „	1.061 „
Ash . . .	0.970 „	—
Oxygen . . .	1.533 „	1.549 „

The oxygen which it contains must, I think, be ascribed to a small quantity of water being left in it even after drying at 130 deg. If this be deducted, then the water and ash-free substance consists of 99.905 carbon and 0.905 hydrogen. This analysis consequently confirms that view of the chemical composition of the soot of flames which is based on the known behaviour of hydrocarbons at high temperatures.

And again:—

In order to show that his view of the luminosity of vapour is not without examples, Frankland points to the luminosity which takes

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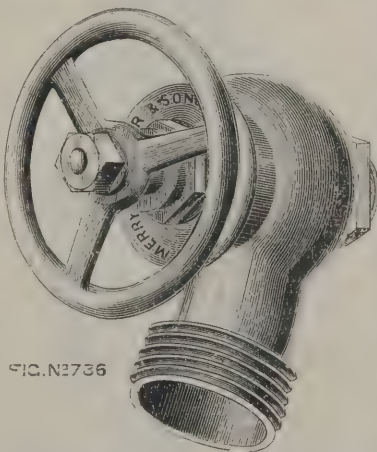


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place on burning arsenic, phosphorus and carbon bisulphide in oxygen gas at the ordinary pressure, and hydrogen and carbonic oxide at an increased pressure, since in these cases the co-operation of solid particles cannot come in question. However valuable and interesting this all may be from a scientific point of view, it does not in any way prove that the process in our luminous flames must be an analogous one, since the well-established fact that solid bodies are specially adapted for becoming radiant is not altered by it, and up to the present only one solid body has been discovered to which one could ascribe the luminosity of these flames. When, therefore, all that has been stated is considered, no other conclusion can be arrived at but that the light of our luminous flames comes from incandescent particles of carbon, and that therefore the old view is the true one.

About this time Knapp showed that the luminosity of a coal-gas flame could be destroyed not only by admitting air, as in the Bunsen burner—which up to this time had been supposed to destroy luminosity by the more rapid combustion of the carbon particles—but also by burning the coal gas with inert gases, such as nitrogen and carbon dioxide, which could take no part in the combustion, a phenomenon explained by Wibel as being due to the cooling effect of these gases upon the flame, as luminosity may be restored by heating the mixture of gases just before combustion. These views were criticised by Dr. Karl Heumann in "Liebig's Annalen," vols. clxxi. and clxxx., as well as Frankland's work, concerning which he says:—

Frankland has broached the hypothesis that the luminosity of flame is not due to particles of suspended carbon, but is caused by the vapours of heavy hydrocarbons, which radiate white light. Strong positive evidence in support of a view so much at variance with the generally accepted theory could hardly be expected, and Frankland has relied principally upon the fact that we are acquainted with many luminous flames in which we cannot suppose that solid matter is present. To the instances already known Frankland has added the interesting observation that hydrogen and carbon monoxide when burnt in oxygen under a pressure of ten to twenty atmospheres yield a luminous flame affording a continuous spectrum, and also that the faintly luminous flame of alcohol becomes as bright as that of a candle when the pressure is increased to eighteen or twenty atmospheres. These experiments are not so convincing as might at first sight appear, inasmuch as we know that the temperature of the flame is increased at high pressures, and also at the temperature of the electric spark many gases yield a continuous in place of a line spectrum. The power of gases as regards emission of light also varies considerably under these circumstances, and it does not appear that we are absolutely necessitated, as Frankland has supposed, to ascribe the increase in luminosity to the increased density of the gas, although, doubtless, this circum-

stance is not without considerable influence. The inquiry as to the nature of hydrocarbon flames is quite independent of the meaning which we may attach to these appearances, and if Frankland puts forward the above-cited phenomena of combustion as analogies to guide him in views concerning carbon flames, no very forcible argument can be really deduced from the examples, because, as W. Stein has pointed out, it cannot be shown that the reaction in luminous carbonaceous flames must be an analogous one to that described above. Frankland's declaration that the soot must be regarded as an accumulation of heavy hydrocarbons, whose vapours are condensed on the cold body brought into the flame, may be regarded as almost confuted by Stein's objection—that in this case the soot must become gaseous at higher temperatures, which is not the case.

And then, going on to Wibel's conclusions, points out that—

Everyday experience tells us that the blue flame of Bunsen's burner, as well as that of the blow-pipe, possesses a much higher temperature than the ordinary luminous flame; but if Wibel be correct in saying that decrease in luminosity is a consequence of cooling only, then, logically, the temperature of the luminous flame ought to be higher than that of the non-luminous flame.

He then attacks the various problems which the Bunsen flame gives rise to, and finally concludes that—

When air destroys the luminosity of a coal-gas flame, there are at least three causes, each of which is capable of decreasing the luminosity of these flames, viz., withdrawal of heat, dilution, and oxidation of the luminous material. In most cases two or more of these causes are at work; in non-luminosity brought about by nitrogen and carbon dioxide, especially dilution and heat absorption; in the widening out of a flame caused by a cold surface absorption of the heat, and a more rapid oxidation of the carbon; and in non-luminosity caused by air, each of the three causes is at work. The flame of a Bunsen's burner appears to be the final product of a whole series of causes acting some in one direction, some in another, and it is not to be wondered at that observers of luminous flames have arrived at such diverse and contradictory conclusions, inasmuch as they have made the study of this flame their principal object, overlooking the great complexity of the conditions affecting it, instead of preceding such a study by an investigation of more simple instances of combustion.

He then fully discusses the effect of cooling upon the combustion in flames, and comes to the following important conclusions:—

1. The fact that a gas flame does not rest upon the burner nor a candle flame upon the wick, as also the fact that a flame never directly touches a cold body held within it, is to be explained by the cooling

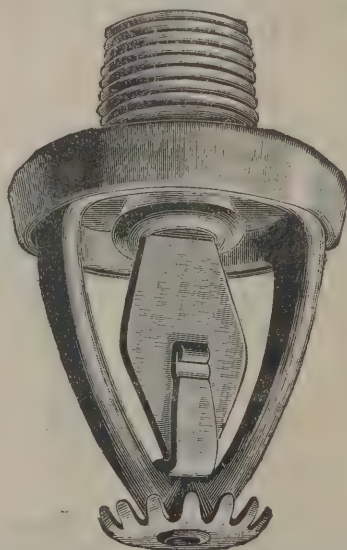
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action exercised upon the gas by its surroundings. When the combustible gases are cooled throughout a definite space below their ignition temperature, the flame is extinguished.

2. The very considerable distance noticed between the burner and the flame of a gas issuing under high pressure, or mixed with a large volume of an indifferent gas, is to be traced to the cooling action of the stream of gas and of the outer air, and perhaps more especially to the velocity of propagation of ignition within the gas.

In a second paper, published in the "Annalen," clxxxiii., "On the influence of withdrawal from, and addition of heat to, luminous flames," several interesting points are discussed, and the author finally points out that—

A cold object brought into a luminous flare causes a suspension of the process of combustion in its immediate neighbourhood, and, at the same time, very materially diminishes the luminosity throughout a considerable space around itself. Carbon-containing luminous materials may burn with or without separation of carbon—that is, with or without luminous flames—according to a certain temperature, differing for each material, is or is not maintained. Combustible material which has been diluted with indifferent gases requires to be maintained at a higher temperature, in order that it shall burn with a luminous flame, than when it is not so diluted. The fact that soot is deposited on a cold object held in a luminous flame is no proof of decreased temperature within the flame, inasmuch as it has been shown that decreased temperature causes a diminution in the quantity, or even total suppression, of the separated carbon. Soot is also deposited on heated surfaces, but is quickly burnt on admission of air. Inasmuch as admission of air cannot be altogether prevented, less soot is accumulated on hot than on cold objects. Burners constructed of iron or other material possessed of high conductivity for heat cause a greater diminution in the luminosity of the lower part of the flame than burners of stearite. The difference between the luminosities of the two flames is rendered more apparent by artificially cooling the burner. The top of the burner and the entering cold gas both exert a cooling action upon the lower part of the flame, and are the cause of the space noticeable between the burner and the flame-mantle. By heating the burner and simultaneously the stream of gas, a more luminous flame is obtained without an increased consumption of gas, the increase in luminosity being greater the smaller is the consumption of gas. The change which is hereby caused in the chemical composition of the gas is without appreciable effect upon the luminosity, inasmuch as no diminution in luminosity is occasioned by again cooling the stream of gas. The heat communicated by increasing the temperature of the burner-tube acts in two ways: it increases the intensity of the light of the flame-mantle, and simultaneously enlarges the flame itself. Carbon is also sooner separated in the flame, and separated at a higher temperature.

His most valuable contribution to the question of whether luminous hydrocarbon flames contain solid particles or not, is to be found in volume clxxxiv. of the "Annalen," in which he shows that—

1. Chlorine causes an increase in the luminosity of feebly-luminous or non-luminous hydrocarbon flames. Inasmuch as chlorine decomposes hydrocarbons at a red heat, with separation of carbon, it follows that the increased luminosity is due to the production of solid carbon particles.

2. A small rod held in the luminous flame becomes rapidly covered on its lower surface—the surface exposed to the issuing gas—with a deposit of soot. The solid soot is evidently driven against the rod. If the soot were present as vapour in the luminous flame, its deposition would be due to a lowering of the flame temperature, and would therefore take place on all sides of the rod.

3. A strongly heated surface also becomes covered with a deposit of soot. This would not be possible if the deposit were the result of the cooling action of the surface upon the flame.

4. The carbon particles present in the luminous flame become visible when the flame is caused to rush against another flame, or against a heated surface. The separated particles are rolled together into larger masses, so that the luminous mantle becomes filled with numerous glowing points. The soot of such a flame is very coarse-grained.

5. The luminous mantle of a flame is not altogether transparent; the thicker the flame-layer and the greater the number of solid particles contained therein, the less transparent does it become. The transparency of a luminous flame is no greater than that of the—approximately—equally thick stratum of soot which rises from the flame of burning turpentine, and which is universally allowed to contain many solid particles. A luminous flame of hydrogen, containing solid chromic oxide, is as transparent as the hydrocarbon flame.

6. Those flames which undoubtedly owe their luminosity to the presence of finely divided solid matter produce characteristic shadows when viewed in sunlight. The only luminous flames which do not produce true shadows are those which consist of glowing vapours and gases. Luminous hydrocarbons produce strongly marked shadows in sunlight; these flames, therefore, contain finely divided solid matter. That this solid matter can be nothing but carbon is evident from the fact that other substances, capable of remaining solid at the temperature of these flames, are absent.

These proofs are, I think, sufficient to convince everyone that the luminous flames of the hydrocarbons actually contain solid carbon particles.

This splendid contribution to the carbon particle theory of luminosity in hydrocarbon flames was further strengthened by

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researches made by Soret ("Philosophical Magazine," 1875), who showed the existence of solid particles in a luminous hydrocarbon flame by focussing the sun's rays upon the luminous portion of the flame and examining the light reflected by it by the aid of a Nicol's prism. Burch also, in 1885, did the same thing in a very similar way. Whilst demonstrating to his landlady that the sun's rays did not extinguish the fire, but only prevented the light emitted by the glowing embers being seen, he was struck by the power of the sunlight in overcoming the light emitted by even highly incandescent bodies; and found that on focussing the sun's rays on a flame a spot of light was visible on the highly luminous mantle of the flame, and the reflected light from this gave ample evidence, when examined by the spectroscope, of the presence of solid particles. Quite lately, also, Sir George Stokes has come to the same conclusion, by experiments of the same character.

I have this evening brought before you the one celebrated attack upon Davy's theory, and the further evidence which it brought forth; and I confess that to my mind the facts are so overwhelmingly in favour of Sir Humphry's original assumption as to the cause of luminosity in hydrocarbon flames, that although Dr. Frankland undoubtedly showed that solid matter was not a necessity for a luminous flame, yet we must admit that in the special class of flames we are considering, the light-giving power is practically entirely dependent on their presence. It must, however, be borne in mind that Dr. Frankland himself is in no way shaken in his opinion, and we may all hope to hear further proof of his theory.

Whilst the physical aspects of luminosity were being studied in this way, there had not been wanting attempts to attack the question from a chemical point of view, and the researches of Dr. Hilgard, Landolt, and Blochmann have done much towards enlightening us as to the chemical changes taking place in hydrocarbon flames.

REGISTRATION OF PLUMBERS.

THE committee of the Exeter Museum and Institute kindly granted the use of rooms in the museum for the purpose of a local examination of candidates for registration by the Worshipful Company of Plumbers, London. The examination was attended by a good number of plumbers residing in Exeter and the district. One of the rooms was fitted up as a plumbers' workshop, with fires for melting solder, &c. The examiners

present were Messrs. J. Knight and C. Dean (representing the London Board of Examiners), and W. Rowe and J. W. Chapman (representing the Plymouth Board of Examiners). Mr. T. N. Andrews, M.I.E.E. (hon. sec. to the Plymouth District Council) was also present. The examination consisted of three hours practical work and two hours theoretical work. During the progress of the examination the rooms were visited by the Sheriff of Exeter, Mr. D. Cameron, city surveyor, Aldermen Domville, Cole, Warren and Varwell, Dr. Harris and Dr. Bell, assistant medical officers of health, and others.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

16. Thomas Marcus Houghton, for "A new or improved balance or weighing-scales."
67. Frederick Ryland, for "Improvements in sash-pulleys or axle-pulleys."
87. John Hircock and William Davies, for "Improvements in a vent-peg."
107. Thomas Kennedy, for "An improved self-closing sash for the use of railway carriages, cabs or tramcars."
160. Walter Brierley, for "Improvements in chimney-tops."
189. Frederic Hitchmough, for "Improvements in sashes and window-frames."
249. Mark Fawcett, Brett Agate Elphicke and John Hope, for "Improvements in the construction of fireproof floors."
265. Frederic Arthur Martin, for "An improved chimney-pot."
314. Charles Edward Jackson, for "Simplex lever fanlight-opener."
346. Andrew Stevens Morrison, for "Improvements in securing door-knobs or handles to spindles."

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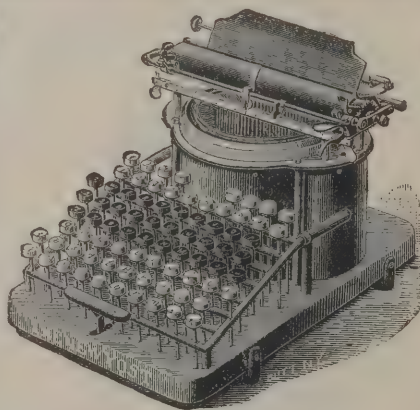
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EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200*l.*, 150*l.* and 100*l.* Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

WAKEFIELD.—Feb. 1.—Designs are invited for the Erection of Council Chamber, Committee Rooms and Offices. Mr. F. Alvey Darwin, Clerk of the Peace, West Riding Offices, Wakefield. Premiums of 200*l.*, 100*l.* and 50*l.*

WINSFORD.—Feb. 13.—Designs, Estimates, &c., are Invited for Proposed Technical Schools and Gymnasiums. Premiums of 50*l.*, 15*l.* and 10*l.* Mr. J. Cowley, Secretary, 38 Witton Street, Northwich.

CONTRACTS OPEN.

ABERCARN.—Jan. 30.—For Building Master's House at Cross Roads School. Mr. George Rosser, Architect, 29 High Street, Newport.

ABERDARE.—Jan. 31.—For Building Business Premises. Mr. Charles H. Elford, Architect, 15 Cardiff Street, Aberdare.

ALSTON.—Jan. 28.—For Building Farmhouse, Tyne Head. Messrs. Webster, Son & Banks, Land Agents, Kendal.

AMLWCH.—Jan. 28.—For Building Semi-detached Villa Residences, Construction of Roads, Drains, &c., Bull Bay. Mr. Robert Grierson, Architect, Bangor.

BATLEY.—Jan. 28.—For Building Pair of Semi-detached Residences. Messrs. P. Spencer & Son, Architects, Batley Carr.

BELFAST.—Jan. 31.—For Building Warehouse. Mr. Henry Seaver, Architect, Belfast.

BELFAST.—Jan. 31.—For Building Workers' Dwelling. Messrs. Young & Mackenzie, Architects, 7 Donegall Square East, Belfast.

BRISTOL.—Jan. 30.—For Building Two-Floor Shed, Dean's Marsh, Docks. Mr. J. M. McCurich, Engineer, Cumberland Basin, Bristol.

BURNLEY.—Feb. 8.—For Plumbing, Glazing, Painting and Hot-water Apparatus, for New Workhouse Infirmary. Mr. S. Keighley, Architect, Nicholas Street, Burnley.

BURY.—Jan. 30.—For the Walls for New Buildings for the Textile Operatives' Association. Mr. D. Hardman, Architect, Silver Street, Bury.

CALEDONIAN RAILWAY.—Feb. 6.—For Station Buildings and Goods Sheds. Messrs. Strain, Robertson & Thomson, C.E., 154 West George Street, Glasgow.

CARLISLE.—Feb. 7.—For Plastering (Robinson's Cement) and Fireproof Flooring at Asylum. Mr. G. D. Oliver, County Architect, The Courts, Carlisle.

CARLOW.—Feb. 2.—For Additions to Workhouse. Mr. J. G. Glover, Clerk to the Guardians, Carlow.

COLCHESTER.—For Rebuilding Furniture Depository. Mr. J. W. Start, Architect, Cups Chambers, Colchester.

CORWEN.—Feb. 4.—For Building Four Houses. Mr. John Williams, Architect, Dee View, Corwen.

DARTMOUTH.—Jan. 31.—For Construction of Sewers. Mr. T. O. Veale, Borough Surveyor.

DUMFRIES.—Jan. 31.—For Mason and Ironwork for Bridge at Drumpark. Mr. J. Symons, Writer, Dumfries.

DUNDALK.—Jan. 30.—For Building Offices, Waiting-rooms, Refreshment-rooms, &c., at New Station. Mr. W. H. Mills, Engineer-in-Chief, Amiens Street Terminus, Dublin.

DUNDALK.—Feb. 13.—For Construction of Sewers. Mr. J. Gaskin, Surveyor, Town Hall, Dundalk.

DURHAM.—Jan. 30.—For Building Six Houses, Red Hills. Mr. H. T. Gradon, Architect, Framwellgate Bridge, Durham.

ELLAND.—Jan. 27.—For Building Two Houses. Messrs. R. Scarborough & Son, Victoria Road, Elland.

FOLESHILL.—Jan. 31.—For Building Senior Boys' School. Messrs. G. & J. Steane, Architects, 22 Little Park Street, Coventry.

GLASGOW.—Jan. 30.—For Stables, Cart-shed, &c., at Partick. Mr. J. Young, 64 Cochrane Street, Glasgow.

GWAELODYGARTH.—Jan. 31.—For Building Master's House. Mr. R. Y. Evans, Guildhall Chambers, Cardiff.

HALIFAX.—Jan. 28.—For Building House, Stables, &c., Mr. Raymond Berry, Architect, Arcade Chambers, Halifax.

HALIFAX.—Feb. 3.—For Building Shed, Skircoat Green. Mr. J. Farrar, Architect, 29 Northgate, Halifax.

HANDSWORTH.—Jan. 31.—For Additions to Board Schools, Boulton Road. Mr. J. R. Nichols, Architect, 59 Colmore Row, Birmingham.

HASLINGDEN.—Jan. 28.—For Building Vicarage. Mr. H. Fielding, Architect, Haslingden.

ILLOGAN.—Jan. 30.—For Additions to Board Schools. Mr. Sampson, Architect, Symon's Terrace, Redruth.

KENDAL.—Feb. 14.—For Building First Two Blocks of Twelve Dwelling-houses. Mr. John Hutton, Architect, Kendal.

KILBOLIN.—Feb. 1.—For Building Caretaker's House and Enclosure Wall at Cemetery. Mr. O'Hanlon, C.E., 8 Westland Row, Dublin.

KING'S CROSS.—Jan. 28.—For Pulling-down Octagon Tower. Mr. W. H. D. Horsfall, Architect, 9 Harrison Road, Halifax.

KING'S LYNN.—Jan. 28.—For Building Technical School. The Borough Surveyor.

LEEDS.—Jan. 31.—For Building Stables for Messrs. Combe & Co., Limited. Mr. W. Wynn, Surveyor, 10 Livingstone Street, Roundhay Road, Leeds.

LLANELLY.—Jan. 31.—For Building Six Shops and Club Premises. Messrs. Buckley Wilson & Glendinning Moxham, Architects, Swansea.

LONDON.—Jan. 27.—For Addition to Patent Office. H.M. Office of Works, 12 Whitehall Place, S.W.

MANCHESTER.—Feb. 9.—For Additions to Horse Hospital. The Engineer's Office, London Road Station, Manchester.

MARYBOROUGH.—Jan. 30.—For Building Chapels and other Additions to Lunatic Asylum. Mr. Thomas Drew, Architect, Dublin.

MERTHYR TYDFIL.—Jan. 28.—For Building Thirty-three Houses. Mr. John Williams, Architect, Edward Street, Morgan Town, Merthyr Tydfil.

MERTHYR TYDFIL.—Feb. 7.—For Building School. Mr. Morgan, Master, Workhouse, Merthyr Tydfil.

MILE END.—Jan. 30.—For Building Pavilions, Laundry Block, Kitchen, Boiler-house, &c., at Workhouse. Mr. Bruce J. Capell, Architect, 70 Whitechapel Road, E.

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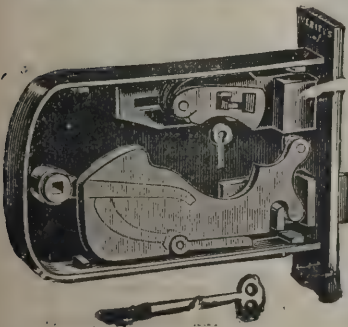
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MORLEY.—Jan. 28.—For Building Wesleyan Chapel and School. Mr. T. A. Buttery, Architect, Morley.

MOUNT PLEASANT.—Feb. 20.—For Second Portion of Parcel Post Office. H.M. Office of Works, 12 Whitehall Place, S.W.

NOTTINGHAM.—Feb. 3.—For Additions to School of Art. Mr. Arthur Brown, Borough Engineer, Guildhall, Nottingham.

OTTERBOURNE.—Feb. 4.—For Building Police-station. Mr. J. Cresswell, County Architect, Moot Hall, Newcastle-on-Tyne.

OXFORD.—Feb. 7.—For Erection of Municipal Buildings. Mr. Henry T. Hare, Architect, 1 York Buildings, Adelphi, W.C.

PORTSMOUTH.—Feb. 21.—For Construction, Alterations and Reparation of Sewers, for the Urban Sanitary Authority. Mr. Alexander Hellard, Town Clerk.

PWLLGWAUN.—Jan. 31.—For Building Infants' School. Mr. J. J. Evans, C.E., Penarth.

SEDGLEY.—Feb. 18.—For Additions to Board Schools. Mr. A. P. Brevitt, Architect, Red Lion Street, Wolverhampton.

SOUTHAMPTON.—Jan. 30.—For Fittings and Furniture for Public Library. Mr. A. E. J. Guy, Architect, 79 Albert Road, Southsea.

SOUTHAMPTON.—Feb. 16.—For Enlargement of Board Schools, Sholing. Messrs. W. H. Mitchell, Son & Gutteridge, Architects, 9 Portland Street, Southampton.

STRATFORD.—Feb. 14.—For Construction of Underground Urinal. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

SWANSEA.—Jan. 28.—For Building Premises. Mr. H. C. Portsmouth, Architect, Castle Buildings, Swansea.

SWANSEA.—Feb. 1.—For Additions to Grand Hotel and Building New Premises. Mr. T. P. Martin, Architect, Heathfield Street, Swansea.

SWINTON.—Jan. 30.—For Enlargement of Board School. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

TREHARRIS.—Feb. 8.—For Enlarging Chapel. Mr. E. E. Watkins, Grocer, Penn Street, Treharris.

TYNEWYDD.—Jan. 31.—For Building Sixteen Cottages. Mr. P. J. Thomas, Nolton Street, Bridgend.

WALSALL.—Feb. 14.—For Building Board Schools. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

WIMBLEDON COMMON.—Feb. 7.—For Pulling Down and Rebuilding Windmill. Mr. Jesse Reeves, Manor Cottage Wimbledon Common.

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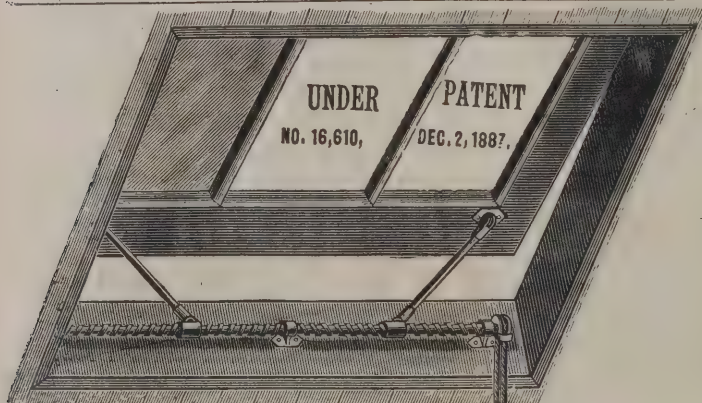
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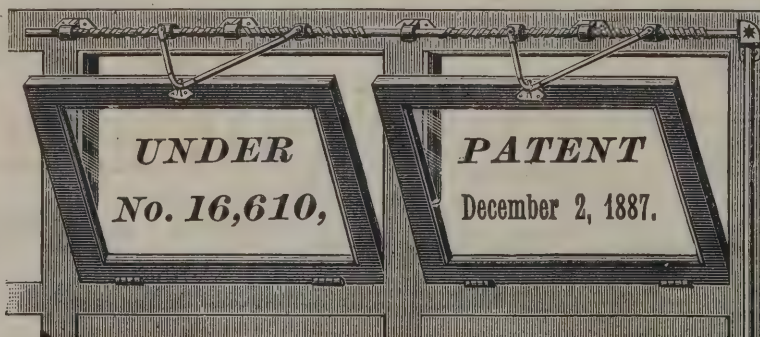
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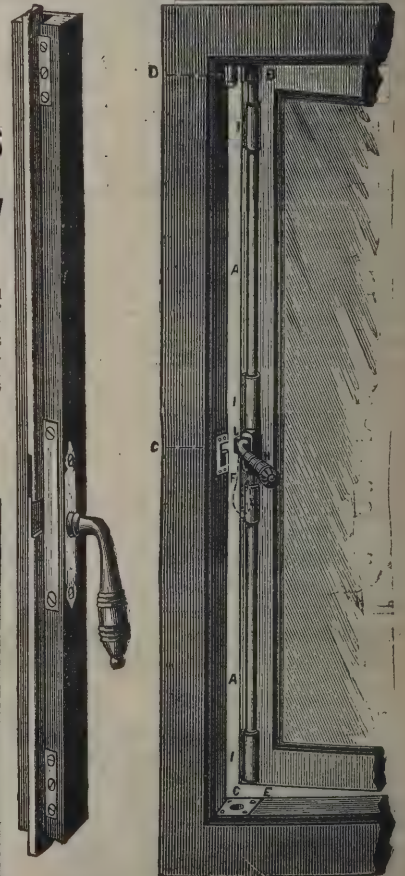
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WARNE & CO., Blackfriars (accepted)	42	10	0

LONDON—continued.

For Building Fire Brigade Station in Queen's Road, New Cross, for the County Council.

J. Allen & Sons, Kilburn	£15,965	0	0
Stimpson & Co., Brompton Road	15,370	0	0
Balaam Bros., Old Kent Road	14,714	0	0
Holloway Bros., Battersea	14,627	0	0
J. O. Richardson, Peckham	14,570	0	0
H. L. Holloway, Deptford	14,537	0	0
W. & H. Castle, Southwark Bridge Road	13,127	5	11

For Foundations for Cottage Dwellings, near Blackwall Lane, for the County Council.

H. L. Holloway, Deptford	£4,316	0	0
J. Mowlem & Co., Westminster	3,295	0	0
Reed, Blight & Co., Westminster	3,288	0	0
S. Chafen, Deptford	2,824	16	6
Treasure & Son, Harringay	2,588	12	0
W. S. Lorden & Son, Upper Tooting	2,560	15	8
Holloway Bros., Battersea	2,439	0	0
Kirk & Randall, Woolwich	2,236	0	0

For Constructing Brick and Pipe Sewers with Air-shafts, Side Entrances, &c., for the St. Luke Vestry. Mr. C. MEABY, Surveyor.

Pavy, Winchmore Hill	£2,450	0	0
Mowlem & Co., Millbank	2,158	0	0
T. Adams, Wood Green	1,629	0	0
E. Parry, Walham Green	1,595	0	0
Wilkinson Bros., Finsbury Park	1,490	0	0

KILLINGBACK & CO., Camden Town (accepted) 1,450 0 0

Mayo & Co., Brixton Road 1,300 0 0

For Asphalte Paving Works, Central Street, for St. Luke's Vestry. Mr. C. MEABY, Surveyor.

French Asphalte Paving Co.	£2,263	2	6
Val de Travers Asphalte Paving Co.	2,212	10	0
LIMMER ASPHALTE PAVING CO. (accepted)	2,162	2	6

For Kitchen Fittings, Hot-plate, &c., for the Cambrian Stores, 44 Glasshouse Street. Mr. R. SAWYER, Architect, 10 Craig's Court, Charing Cross.

Davis & Co.	£348	15	0
Wilson & Son	331	14	0
Sugg & Co.	306	10	0
W. H. Godden	277	0	0
Wilson Engineering Co.	246	10	0

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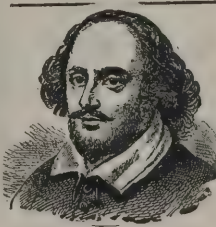
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For Construction of Two Small Powder Magazines, Concrete Vault, Machine House, &c., near Lyndhurst, for the Schultze Gunpowder Company. Messrs. LEMON & BLIZARD, Architects, Southampton. Quantities supplied.

Stevens & Co., Southampton	£796	0	0
G. B. Jordan, Southampton	795	0	0
De Vere, Buckingham, Basingstoke	795	0	0
F. Walter, Southampton	762	0	0
J. Butt, Southampton	750	0	0
S. Chafen, Deptford	748	0	0
F. Reeks, Lymington	712	0	0
Architect's protecting estimate	760	0	0

WORCESTER.

For Erection of Victoria Institute, for the Corporation of Worcester, including Additional Estimates for Terra-cotta Externally and Internally, Marble and Mosaic Staircase and Paving and Extension of Book Store under News and Magazine Rooms. Messrs. JOHN W. SIMPSON and E. J. MILNER ALLEN, Joint Architects, 10 New Inn, Strand, W.C. Quantities by Messrs. PINKS & WATSON, 45 Parliament Street, S.W.

North Boundary Wall.

Bromage & Evans, Worcester	£27,323	15	2	£673	19	0
H. Smith, Kidderminster	27,229	0	0	843	0	0
Heatherley Bros., Coventry	27,141	0	0	739	0	0
Kilby & Gayford, London	26,172	0	0	769	0	0
W. King & Son, London	26,166	0	0	874	0	0
Taylor Bros., Hastings	25,971	6	7	780	0	0
John Kendrick, Worcester	25,651	0	0	750	14	0
De Vere, Buckingham & Co., Basingstoke	25,176	2	3	737	4	11
H. Willcock & Co., Wolverhampton	25,149	6	0	772	0	0
B. Whitehouse, Birmingham	24,965	0	0	748	0	0
P. Peters, Horsham	24,672	5	6	748	9	6
E. H. Lovatt, Wolverhampton	24,369	0	0	729	0	0
G. F. Smith & Sons, Leamington	24,362	0	0	738	0	0
C. W. King, Cheltenham	24,351	13	3	677	1	8
W. Bowers & Co., Hereford	24,071	18	9	735	1	5
John Bowen, Birmingham	24,065	0	0	689	0	0
J. Wood & Sons, Worcester*	23,833	0	0	712	0	0

* Recommended for acceptance.

LUTON.

For Alterations and Repairs to Premises adjoining Town Hall, and to Town Hall, Luton. Mr. T. R. ROSCOE, Architect.

G. Smart, Luton	£185	0	0
D. Parkins, Luton	156	0	0
W. G. Sharpe, Amptill	128	0	0
J. Taylor, Luton	105	14	0

RIPON.

For Building Mechanics' Institute and Technical School, Ripon. Mr. G. STYAN, Architect, York. Quantities by Architect.

Accepted Tenders.

A. Trees, Ripon, excavating, draining, brick-work and masonry	£819	0	0
J. P. Simpson, Ripon, carpenter and joiner	450	0	0
B. R. Wigglesworth, Ripon, smith and founder	155	0	0
J. Dobson, Hunslet, plasterer	152	0	0
J. Baynes, Ripon, slating	82	13	0
W. E. Dixon, Ripon, plumbing and glazing	77	0	0
Barton & Son, Ripon, painting	30	0	0
Total	£1,765	13	0

ROCHDALE.

For Five Slipper Baths, Rochdale, in connection with the Second-Class Department, for the Baths Committee. Quantities by Mr. S. S. PLATT, Borough Surveyor. W. Driver, Merefield, Rochdale, joiner and builder. J. Wild, Rochdale, plumber.

DECORATIVE WORK IN THE CITY.

THE great dome at the City Bank, Threadneedle Street, is worth the attention of architects. The ironwork divides it into twenty-four bays of five panels each tapering at top. It is treated ornamentally, two designs being used, alternated in each bay. The glass used is three-eighths of an inch rough rolled and the ornament is painted and stained, the effect being obtained by the variety in the stain from a pale gold to a rich amber. The base of each bay is over four feet, and the height of each of the five panels forming the set is close upon another four feet, the panes being bent to the proper curves. Of course, the thickness of the glass and size of the panels necessitated the greatest care in the selection of the glass, firing, bending and fixing, but the whole was most successfully carried out by Messrs. Duff & Spagnoletti, of the Hogarth Studios, London, W.

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Acid-Resisting Asphalt.

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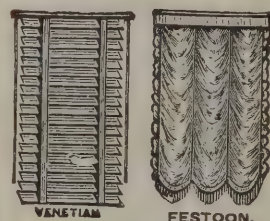
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ARCHITECTS are invited to SPECIFY it
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ADVANTAGES.—The framework is cast in one solid piece. The Armature can be taken out in a few seconds. There are no loose wires dangling from the brush-holders. The "Infant" Dynamo attains the high efficiency of 92 per cent. Full particulars and prices on application.

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Unrivalled for Quality, Colour, and Durability.

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International Exhibition,
London, 1883.
"Model Dwelling," New-
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CASES FOR BINDING THE ARCHITECT.
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Although various causes were against the panes resisting great changes in the atmosphere, besides the fact of the iron contracting or expanding, it has stood the test without the cracking of a single piece.

THE ALEXANDRIA COMPOUND.

AMONG the useful paints that modern ingenuity has devised it will not be easy to find anything more excellent than the Alexandria compound, which is a substitute for paint and distemper. This material can in no sense be considered one that is on trial, as it has been in use for a sufficient number of years to make or miss its mark, and for the past twenty-five years it has been supplied to the French Government; and, moreover, the manufacturers have sufficient confidence to sell under a written guarantee. Judging from the samples also, it can easily be believed that the merits claimed are not over estimated. Any tint or shade can be made to order, in addition to the standard shades. It is applicable to both woodwork and ironwork as well as walls, but in giving an order the material to be covered with it must be specified. Thus it is described as equal in appearance to the best flatted paints, and when varnished superior to paint; that it is fire-resisting, non-poisonous and odourless, while one hundredweight will cover 800 super yards; that it is durable and much cheaper than paint, and will not crack or blister through heat. It is recommended for mansions, churches, colleges, hospitals, railways, factories, Board schools and other public and private buildings; for inside and outside of walls, wood and all kinds of ironwork, steamship funnels, paper, &c. Siccatis brilliant is an enamel paint drying on everything in any weather in twenty minutes, and claimed as the best cure for damp walls. With two coats of this enamel applied to the dampest or the most dirty places the hardness and brilliancy of porcelain are obtained in two hours. Instant enamel dries on everything and in any weather in twenty minutes, and can be mixed with any paint, ground in oil or in powder. Iron enamel for out-door work, as a most durable enamel paint, is recommended to be applied on bricks, cement, iron, wood, tin and all kinds of out-door work. Paris white enamel is white and bright as the most beautiful porcelain, and is for finishing on white ground for all kinds of decorations, baths, statues, &c. The manufactories are—in London at 16 New Church Road, Camberwell; and in Paris at 37 Rue des Rosiers, St. Ouen. The sole proprietors are W. E. Spencer & Co., 68 North Street, Gore Wharf, Hackney, N.E.

SASH-CASEMENT COMPANY'S PATENT WINDOW.

THE advantages claimed for this specialty over ordinary windows are as follows:—1. The invention can be applied to any ordinary window. 2. By the system of attaching sash-cords all the time taken up in getting out the sashes, removing the front beads, parting beads, &c., is saved, and the woodwork and painting are not damaged. 3. The pulley arrangement consists only of two spindles and four loose wheels, and these can be applied so easily that any one without mechanical skill may undertake it. 4. The most important function claimed for this patent is, that by one single action the ordinary sash-window is at once converted into a casement-window, and thereby making window-cleaning safe, easy and pleasant. 5. The whole of the painting of sashes and frames, inside and out, can be easily done from the inside, thus saving the time in splicing and unsplicing of ladders, and the requirement of a man at the foot of the ladder as required by the Corporation by-laws. 6. That when any parts of the patent window get difficult to work, the affected parts are easily accessible, and adjusted without disturbing any portion of the window. 7. That through the opening of the top or bottom or both of the sashes of the patent window when in use as a casement, large articles of furniture, &c., can be removed with ease, thus saving the cost of a joiner in removing and replacing the sashes. 8. That in case of fire a large opening can be easily and quickly made to get rid of heat and smoke, and to pass out goods, &c., without necessitating the firemen to smash the glass and cut away the frames. 9. That as the patent window is made to fit very true, and has, when closed, an extra binding on each side, it is necessarily more weather-proof than an ordinary window.

IRON AND STEEL MANUFACTURE.

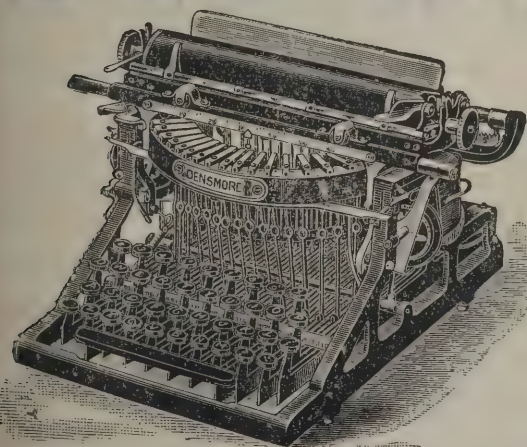
THE *Glasgow Herald*, among other reports of the local industries for the past year, gave the following details:—

Iron Roofing.

The reports in connection with this class of work, which may be taken to include building constructional work generally in so far as iron and steel are concerned, are, upon the whole, of a favourable nature, most of the firms engaged in this particular line having been well employed during the year.

THE DENSMORE.

THE WORLD'S GREATEST TYPEWRITER.



TO ARCHITECTS.—If you have come to the conclusion that the use of a Typewriter for writing your Specifications and Contracts will **SAVE YOU TIME AND MONEY**, give the DENSMORE a thirty days' trial before purchasing any other.

The Machine may then be returned if not found satisfactory in every respect, and a decided advance in typewriting mechanics.

If you decide to purchase it, we guarantee it free from all mechanical defects, and keep it in order for two years free of any charge.

TWO CARRIAGES, fitted with **SOFT** and **HARD** CYLINDERS, which are instantly **INTER-CHANGEABLE**, are furnished with each Machine without extra charge—thus one DENSMORE performs the work of two ordinary machines.

NO LIFTING OF CARRIAGES REQUIRED IN ORDER TO SEE YOUR WORK.

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The Densmore Typewriter Co., Ltd.

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Tuition Free to Shorthand Writers on application at Office. Telephone No. 11,321.

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PENNANT STONE

(BRISTOL GRANITE).

Hard as Granite, but Non-Slippery.

No Stone gives such satisfaction for

STEPS, LANDINGS, ENGINE BEDS,

Sinks, Troughs, Plinths, Bases, Girder Beds, and Architectural Work generally.

SPECIALLY ADAPTED FOR STREET WORK.

References to Urban and Local Authorities in all parts of the Kingdom.

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Prices on application to Manager,

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The Mangotsfield Pennant Stone Company (Ltd.),
DOWNEND, BRISTOL.

BUILDING IN WINTER.

"Randall" Mortar Sets during Frost.

No Stoppage of Works.

Lime Mortar is developed into Cement.

Soft Stone hardens into Marble.

RANDALL'S STONE CO., KENTISH TOWN, N.W.

THE

Art Metal Manufacturing Co.,

MEDIAEVAL SMITHS AND LANTERN MAKERS,

Interior and Exterior Gas and Electric Fittings, Outside Lamps,

WROUGHT-IRON SIGNS, GRILLES, GATES, RAILINGS, &c.

Gasaliers • Candelabras • Brackets • &c.

DESIGNS AND ESTIMATES ON APPLICATION.

Offices and Showrooms:—42 Lamb's Conduit Street, London, W.C. Works:—Tooting, Surrey.

Amongst the more important contracts entered into may be mentioned the new retort-house and coal-store for the Glasgow Corporation Gas Commissioners at Dawsholm. This contract has just been completed by Messrs. P. & W. MacLellan (Limited), who are presently engaged upon a similar contract for the Corporation of Paisley. Messrs. MacLellan have also erected during the year the roofing of a new passenger station at Ardrossan for the Glasgow and South-Western Railway Company, and are just completing the large double goods shed at Cessnock Dock, Govan; while they have executed many important foreign contracts for roofing and work of a similar nature. Messrs. Findlay, of Motherwell, have been busily engaged during the year with the roofing for the Caledonian Railway Princes Street Station, Edinburgh, and have otherwise been fairly well employed. Other important contracts that may be mentioned were the electric lighting station in Waterloo Street, also the roofing of new tube-works at Coat-bridge. There is a considerable volume of work in hands at the moment, but of the prospects for the future much cannot be said of an encouraging nature.

Cast-iron Pipes.

This, which is one of the leading industries of the Glasgow district, has during the year 1892 been subject to the general depression. The whole output for the year has been considerably below the average. Hardly any large contracts for abroad have been secured by local makers, although various small indents for pipes have been executed for all parts of the world. The excessive protection given by the Australian colonies to colonial pipefounders is practically closing these markets against the mother country. There have been a few good inquiries from India, but only one or two of them have been secured by Glasgow foundries. Nothing whatever has been done in South America, where before the Baring crisis many thousands of tons were shipped annually from Glasgow to Buenos Ayres alone. However, this part of the world is gradually resuming a state of financial tranquillity, and more orders are hoped for during 1893. For North America a small contract for Vancouver Waterworks has been executed, and also one or two orders for South Africa. The extra large quantities of pipes required by local water and gas works have helped to keep the various foundries employed—Glasgow, Dundee, Edinburgh, Aberdeen and other corporations have all been large purchasers during the year. The most important contract has been the pipe main from Craigmaddie new reservoir to the

city, amounting to about 11,000 tons of 36-inch pipes, which was fixed in the autumn. There are several good orders likely to be placed soon, the principal of which is 20,000 tons of large pipes for the waterworks of Tokio, Japan, and it is anticipated it may come to Glasgow. The amicable relations between pipe foundries and moulders which characterised the preceding year have been maintained during 1892.

Ironfounding.

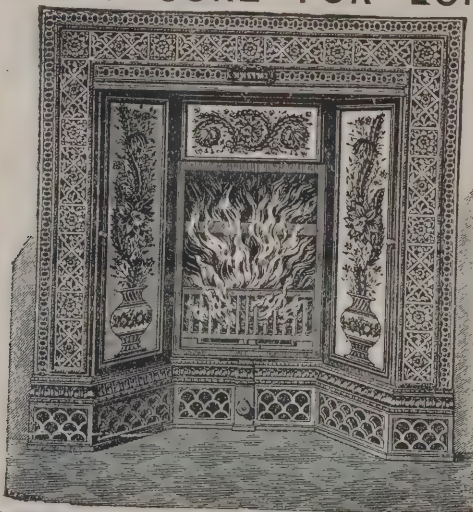
Light ironfounding has been well maintained during the year, but the prices obtainable show no improvement, and this applies more especially to the plain light castings. The home trade, which almost entirely depends on the state of the building trade, has had the benefit of the exceptional briskness in the latter. Foreign shipments, although better than 1891, are very far short of what they should be, and the prospects for 1893 are anything but bright. The Sun Foundry has been fully employed during the whole year. In some of their departments they have been unusually busy, being unable to cope with their orders, and being compelled through want of room to employ moulding shops outside their own city foundry in Kennedy Street. Verandahs, balconies, shelters, drinking fountains, station work, public conveniences, and stable fittings have been in much greater demand this year than last, but chiefly for home use, while bandstands, kiosks, pavilions, sanitary, and especially ornamental lavatory and bath, castings have been supplied almost entirely to foreign order, the South of Africa now taking rank as a most important buyer. There has been a constant run of orders for handsome electric pillars for the principal cities at home and abroad where street installations have been effected, and with very few exceptions this foundry has secured the whole of the orders for these important castings which have yet been offered to the trade. The foreign orders for rain-water goods have not been so plentiful at acceptable prices as in the past year, though within the last four months large orders have been accepted for Australia and South America which will take up a big amount of tonnage. Prospects for the coming year are fully as brilliant as they have been in any previous year, the firm being already pretty well booked up, both in structural work and heavy ornamental castings.

Light Castings.

During the past year the light-castings trade in the Falkirk district has been very good, and all the foundries kept fully employed. The present social difficulty—the unemployed—

ONLY CURE FOR LONDON

FOG. HEIM'S GRATES, STOVES, CALORIFER.



H. HEIM,

ART METAL WORK.

Ornamental Wrought-Iron Work.

Gas and Electric Light Fittings of all kinds.

STAINED GLASS.

DESIGNS AND ESTIMATES

ON APPLICATION.

London Sample Room:—

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SCOTLAND:—

Mr. C. M. HERON, 64 North Frederick Street, Edinburgh.

Central Heating Apparatus, ABSOLUTELY SMOKE-CONSUMING, attested by the National Smoke Abatement Institution. ECONOMY IN FUEL, 35 TO 45 PER CENT. FOR DWELLINGS, HALLS, and PUBLIC BUILDINGS. Rapid Heating. Excellent Ventilation. No dust in the room. Perfect and simple Regulation of Warmth 40,000 in Use.

Patented Everywhere. Particulars sent Free. Manufacturer, 95 & 97 OXFORD ST., LONDON, W. Workshops:—DEAN STREET, W.



JOHN CLARK,

Bloomsbury Brass & Wire Works, 46 & 47 High St., New Oxford St., W.C., Manufacturer of every description of useful and ornamental

WIREWORK

for Wirework for the protection of Windows and Skylights. Prices Lists and Illustrations post free on application. Half-inch Mesh, 4½d. per foot super. Estab. 1855. Telegraphic Address: "Phoenantry, London." Special attention given to Architects' Designs.



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WORKS, ROTHERHAM. Estab. 1854.

has not been experienced in this district. It is true that in such a large manufacturing centre there will always be a certain number of men out of work; but depression of trade has not caused any suffering, nor strife nor unpleasantness, between the employers and employed. This redounds greatly to the credit of the employers for their forbearance and consideration for their workpeople, as in many cases competition has had to be met by reduced prices, and so far without their seeking any corresponding reduction of wages. It is cheering to record in these days that we find one district at least free from the turmoil of industrial war, and where wise and prudent counsels evidently prevail. At Carron Works, which are the oldest and principal works of the kind in the kingdom, trade has been exceptionally good, with an increasing demand for higher and better class goods. For special cooking apparatus and appliances—for coal, steam, and gas (which is now a specialty at Carron)—there has been a steady demand both for home and abroad, also for stable and cattle house fittings. A slight falling off in the home demands has been counterbalanced by an increased trade from the colonies. So much has this business at Carron developed that further additions to the shops and plant will shortly be a matter of necessity to overtake the orders coming in. In the engineering section considerable orders are on hand for engineers' blocks, torpedo gear, block bindings, rigging screws, radiators and ship sidelights, cabin seat-stands, and other furnishings for ships. The growth of this department, and the demand for special tools and plant for the general moulding and fitting shops, has necessitated the establishment of a special department, equipped with good machines, for making all the special plant required by any department of the works, and as a matter of course in such a large concern it is generally very busy. In the heavy foundry department trade has not been sought for general work in consequence of the prevailing low prices for this class of castings; but recently a contract has been made with the North British Railway Company for the castings required in the construction of a new tunnel under the Mound, Edinburgh, and it is hoped that this may be followed by others of a similar nature. It is now an undisputed fact that the Falkirk district is the most important centre of the light-castings trade in the United Kingdom. Years ago, and until very recently, the Sheffield and Rotherham district had an undoubted sway; but now there are several firms in the district besides the Carron Company who can hold their own against the Yorkshire houses, and in some respects are able to beat them. The district is awakening to the im-

portance of art and technical education, and when the efforts that are now being made in this direction—and especially to develop and educate the artistic taste in the district—meet with success, then there will be assuredly a greater future for the Falkirk neighbourhood in this special branch of industry.

Bridgebuilding.

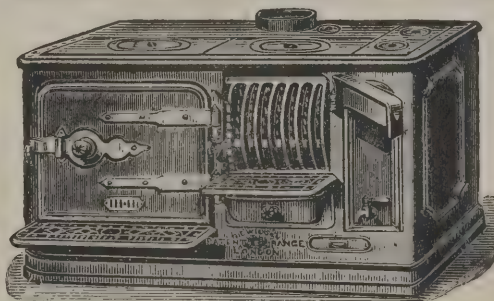
In concluding our report for the year 1891 we mentioned that there was a fair amount of work then in hands, and that the prospects at the time were of an encouraging nature. We are pleased to have to report that during the year now drawing to a close our local bridgebuilders have been well supplied with orders, both for home and foreign account. Amongst the former may be mentioned the new Rutherglen bridge across the Clyde, the contract for which was secured by Messrs. Morrison & Mason. This is, however, built mainly of granite resting on steel caissons. The same firm have also secured the contract for the temporary bridge to be erected across the Clyde at Jamaica Street, and we understand Messrs. William Arrol & Co., Dalmarnock Ironworks, will supply the steel girders. This latter firm secured the contract for the Bonar Bridge across the Kyle of Sutherland, and during the year have been well occupied with the Tower Bridge, London, and other important contracts. Messrs. MacLellan (Limited), of Clutha Works, have turned out a large tonnage during the year, principally on foreign account, and amongst their contracts may be mentioned a floating railway bridge to cross the river Sardah in India. The girders will rest upon pontoons anchored in the river. This company has also constructed a bridge consisting of 34 spans of 90 feet each and another of 23 100 feet spans for the Indian railways, and have just completed the Bilston Viaduct, on the North British Railway near Roslin. Other bridge builders in the district have been more or less well employed, and upon the whole it may be said that at least an average amount of work has been turned out during the year. Competition has been pretty keen with most of the contracts, and as a consequence builders report that there has been but a bare margin of profit left. Prices have been gradually falling, in keeping with the reductions that have been taking place in the cost of steel. From all that we can gather, there is a fair amount of work in the hands of builders at the moment, and some good inquiries are in the market, principally for foreign account. There have been no trade disputes of any consequence during the year, but wages, as is the case in most trades, are looking downwards.

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BUILDING AND BUILDERS.

THE Aberdeen University private Bill, which proposes an extension of the existing buildings and the re-erection of Greyfriars' Church, has passed the Standing Order stage.

THE Warwickshire County Council have sanctioned a recommendation of the County Buildings Committee to purchase 2,460 square yards of land in Victoria Road, Aston, at a cost of 4,525 $\frac{1}{2}$ l., adjacent to the present police-court, for the purpose of erecting a new Petty Session Court-house, at an estimated cost of 9,000l.

THE Tunstall Board of Guardians have decided on the erection of a new hospital and certain alterations at the workhouse, for the purpose of increasing and improving the accommodation, the estimated cost of the work being 6,000l.

AT the meeting of the Glasgow Association of Students of the Institution of Civil Engineers, Mr. Robert Robertson, vice-president, in the chair, a paper was read by Mr. W. B. Venters on "Building Stones: their Chemistry and Geology," in which the author went very fully into the chemical composition of stones and their power of resisting atmospheric influences.

BUILDING operations for the erection of the South-Eastern Hotel at Deal, to carry out which a company has been formed, are to be commenced in the next six weeks. Mr. Laidlaw, the proprietor of the Deal Pier, has joined the board of directors.

THE new general Post-office for Tunbridge Wells will be built in Vale Road, and a new central sub-office will be built near the entrance of the Calverley Road.

THE Board of Guardians at Chesterfield are at present considering a proposal to enlarge their workhouse, as increased and improved accommodation is thought necessary.

PLANS have been approved by the Rickmansworth Rural Sanitary Authority for the erection of six new almshouses in Bury Lane, Lord Ebury having given the site. The erection of the houses is to be put in hand as soon as the weather permits.

THE annual meeting and dinner of the Bristol Master Builders' Association has just been held, Mr. E. T. Hatherly, the retiring president, in the chair. Mr. A. Krauss was elected president for the ensuing year. Mr. A. Barratt responded to the toast, "Architects, Engineers and Surveyors."

THE new church of St. Michael and All Angels, Barnes, has been opened. Mr. Charles Innes, architect, of No. 27 Queen Street, City, designed the church and superintended its erection. Messrs. Balaam Brothers were the builders. The cost of the portion of the building at present erected has been about 5,000l.

TRADE NOTES.

WE have received from Messrs. William Sugg & Co. a copy of their "Gas Engineers' Pocket Almanac," which contains much useful information, not only for gas engineers, but also for architects and builders, including, for example, the requirements of the Metropolitan Gas Referees, for the testing of the illuminating power and purity of gas. Included with these are particulars of the apparatus required. Then we have an account of various forms of "photometer," and various indicators and meter-testing apparatus. This little volume also contains a useful series of tables for comparing weights and values of gases and liquids. The work should be in the hands of every architect in the kingdom.

IT is stated that the tender of Mr. Walter Binns, of Bradford, has been accepted for the chief portion of the work in the extension of the Menston Asylum.

THE Board of Guardians, Tunstall, have accepted the tender of Messrs. Rowell & Co., London, for the erection of an attendant's cottage of corrugated iron, to add to the accommodation of the infectious wards at the workhouse, for the sum of 122 $\frac{1}{2}$ l.

THE annual report of the Visitors of the Somerset and Bath Pauper Lunatic Asylum states that the tender of Mr. Phillips, of Exeter, at 113,300l., for carrying out the building of the New Western Asylum has been accepted, and the contract prepared accordingly. This does not include roads, fences or electric light.

A COMPANY has been formed for the purpose of acquiring and working the English patent rights of Mason's patent safety-tread covering for stairs, steps, platforms, floors, landings, &c., which is believed to have been demonstrated to be the most valuable invention of the kind ever introduced to the public, and one that cannot fail to supersede all other tread coverings. It provides a perfectly sure foothold, is in the highest degree durable and can be supplied and fixed at a less cost than other patent coverings. The offices are at 15 Barbican, E.C., Mr. A. Reid (*pro tem.*) secretary.

ELECTRICAL.

AT Irvine another inspection of the Burgh Mill has been made at the instance of the Corporation. Mr. Carrick (Carrick & Ritchie, Edinburgh, patentees of the Waverley turbine), accompanied by a representative of Messrs. Anderson & Munro,

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We beg to inform you that Mr. J. R. FAWKNER, who for the past fourteen years has held a responsible position in the London Works and Offices of Messrs. CROSSLEY BROS., Lim., original makers of the well-known "Otto" Gas Engine, has resigned his position to enter into partnership with Mr. HENRY J. ROGERS, M.I.M.E., under the above style, as Manufacturing Engineers, Electricians, and Founders.

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electrical engineers, Glasgow, visited the mill, with the view of calculating the water-power and other power available. Mr. Carrick expressed the opinion that with the steam and water power at command a current might be generated sufficient to give the town between forty and fifty arc lamps.

THE *Scotsman* says:—The deputation from the Edinburgh Town Council who recently inquired into various systems of electric lighting in use across the Border have now adjusted their report. After stating that they feel sure that the delay of the Corporation in taking up the work has been of great advantage to the city, on account of the experience gained by other towns, they state that from conversation with certain authorities they learned that experience had shown that electric lighting is not likely to prove profitable until the second or third year, as many consumers only apply after they have seen the light used by more enterprising neighbours; but in the various places visited the deputation found that the demand for electricity was increasing. They were very strongly advised by the authorities with whom they came in contact to work the Electric Lighting Order themselves, and not to hand it over to a company, but at this stage they are not prepared to give a preference to any of the systems visited.

At a recent meeting of the Insurance Institute of Ireland, in Dublin, a paper was read by Mr. A. E. Porte on "Fire Risks from Electricity." The subject was exhaustively dealt with, and illustrated by experiments and diagrams. Mr. Porte explained how the risks from imperfect installations constitute a source of danger, and pointed out the means by which these could be avoided.

At the meeting of the Leeds Architectural Society Mr. T. S. Watney (Shepherd & Watney, civil engineers, Albion Street, Leeds) delivered a lecture on "Electric Lighting." He explained the various forms of motive power used in supplying the electric light in private houses and also for extensive private installations. He next described the dynamo, the arc-lamp, the incandescent-lamp, switches and other apparatus, showing how the form of those appliances had been improved of late years. Forms, he said, that were almost perfect eight years ago were now considered totally inadequate by fire-insurance companies and by good engineers. He exhibited samples of the older apparatus and of the new, pointing out the difference between the two. The materials now used must be of an incombustible character. Vulcanised rubber-covered wire has now almost superseded the old cotton and plain rubber-covered wire. He

then explained the best method of wiring a house, showing how the wires should be carried from one room to another. Every piece of wire throughout the installation should be easily got at, so that it might be repaired when required without disturbing either the walls of the rooms or the wall-paper. Finally he touched on the best forms of fittings and the general cost of the electric light.

THE *South-Eastern Gazette* says:—Mr. Hawtayne has presented a scheme to the Maidstone Local Board in accordance with the resolution arrived at in October last. We are unable to-day to give more than its chief points. Under this scheme he proposes to erect a supply station at the sewage works to generate current for 2,000 sixteen candle-power incandescent lamps, of which 500 are to be distributed among public buildings, and the remaining 1,500 to be furnished to the shops and houses requiring them. Mr. Hawtayne suggests the abandonment of street lighting for the present, or until such time that the profit in the supply of electricity to private consumers will justify outlay on the improvement of public lighting. The current is to be brought from the sewage farm to the town by overhead cables running along the towing-path. The idea of utilising water-power has been abandoned as impracticable. The cost for plant and extension of mains is estimated at 10,450*l*.

VARIETIES.

IT was feared that the breaking up of the ice would endanger the foundations of the Auld Brig o'Ayr, and in consequence it was closed to the public. The *Scotsman* says the venerable structure was barricaded only on the afternoon, when the ice came down on the breaking up of the dam. The bridge appears to have sustained no damage, and has since been opened to the usual passenger traffic. It seems strong enough to be able to repeat the prophecy—"I'll be a brig" when some others are "a shapeless cairn."

THE *Glasgow Herald* says:—The effects of the underground workings on the estate of the Duke of Hamilton are being felt afresh by numerous proprietors in the west end of the town of Motherwell. The Burgh Buildings are also showing traces of renewed subsidences. The front elevation of the Council Chamber has been rent from top to bottom by a crack half an inch wide, and the burgh offices have also been damaged to a serious extent internally.

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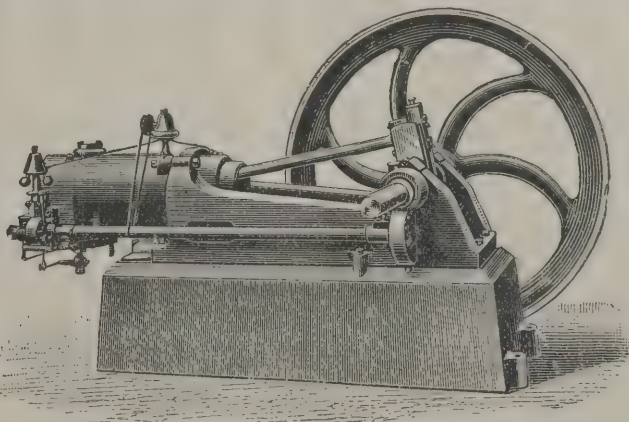
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Patent Timers. Patent Anti-Fluctuating Gas Bags. Patent Cataract Governors. Change Speed Governors.
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AN inquiry has been held at the Halifax Town Hall relative to the application of the Corporation to borrow 100,000*l.* for gasworks extension. The proposed extension will be on a site adjoining the present works, on the westerly side of the Hebble. A further inquiry was held as to the application to borrow 14,000*l.* for sewage disposal.

AT the meeting of the Birmingham Association of Students of the Institution of Civil Engineers, Mr. A. P. Maddocks, of Mason College, read a paper on the "History of Bridge Building." The paper dealt with examples of bridges dating from prehistoric times down to the present day, and was illustrated by etchings of many very interesting bridges all over the world.

AN inquiry has been held by the Local Government Board in respect of an application by the Mansfield Town Council to borrow 25,000*l.* to provide an increased water-supply. The scheme has been prepared by Mr. Hodson, C.E., and recommended for adoption by Mr. J. Hawksley, C.E.

THE Northampton School Board have decided to apply for a loan of 10,400*l.* 18*s.* from the Public Works Loan Commissioners to defray the cost of the erection of the new school buildings in Stimpson Avenue, in detail as follows:—Building, 8,439*l.*; furniture, 896*l.* 18*s.*; architect's commission, &c., 835*l.*; other expenses, 240*l.*

AN inquiry was held on January 19, at the Local Board Offices, Leyland, by Mr. F. H. Tulloch, C.E., on behalf of the Local Government Board, into an application made by the Leyland Local Board for powers to borrow 3,388*l.* for the following works:—Extension of the sewerage system, rebuilding of a bridge over the river Lostock, works of improvement in reconstructing main roads, also for works to augment the Board's water-supply for the district. These works were stated to be necessary, mainly owing to the growing requirements of the district. The Board's engineer (Mr. Wm. Wrennall, C.E., of Liverpool), gave particulars of the estimates and explained the plans for the various works. The Inspector afterwards visited the sites and the inquiry ended.

THE Nottingham Town Council propose to borrow 47,383*l.* to carry out certain public works in the borough, including 20,500*l.* for street improvements, 17,000*l.* for purposes of sewage disposal, 6,872*l.* for providing police stations, public libraries, a reading-room and mortuary, 3,000*l.* for laying out the Bath Street Recreation Ground, 1,900*l.* for museum and other purposes and 1,111*l.* for providing a disinfecting station. An

inquiry has just been held, and in the absence through indisposition of the town clerk, Mr. F. B. Harris, Mr. Arthur Brown, borough engineer, explained the plans.

THE site of the proposed new harbour at Ravenscraig, Kirkcaldy, has just been surveyed by engineers on behalf of the North British Railway Company. The estimated cost of the proposed works is 300,000*l.*

AT the sitting of the Manx Tynwald Court a report from a committee was read recommending the carrying out of important harbour works at Douglas, Ramsey and Peel.

AT the annual meeting of the Mason College Engineering Society, Birmingham, Mr. R. J. Richardson in the chair, a paper was read by Mr. Charles Hunt, C.E., on "Gas-making Plant." The paper described in detail the most modern methods of gas production and purification, such as those adopted by the Birmingham Corporation.

MESSRS. HUDSON & KEARNS write us:—"We are very much obliged to you for your kind notice about our diaries, which appears in your paper of the 13th. You have, however, printed our name as Kearns, instead of Hudson & Kearns, and as our diaries now for some twenty years have been known as Hudson & Kearns' architects' diaries, it may possibly cause a little confusion. We are afraid it will be trespassing on your kindness to note this, but if you would do so for us we should appreciate it."

GREEN DRAGON, WINCHMORE HILL.

WINCHMORE HILL was once a border village of the great Chase Forest, one of the last remnants of which is the Winchmore Hill Wood, through which now runs a public footpath for about three-quarters of a mile, and which is certainly one of the prettiest walks in Middlesex. Tom Hood, the poet and humourist, resided some years in a villa some two hundred yards from the Green Dragon. In his poem, "Our Village," many of the objects depicted may still be recognised at Winchmore Hill. Thus he wrote, "There are plenty of public-houses, but the Green (Man) Dragon is reckoned the best, as it is the only one for love or money can raise, a postilion, a blue-jacket, two deplorable lame white horses, and a ramshackle, neat post-chaise." Probably the new Green Dragon will, like the old one humorously spoken of by Hood, be reckoned one of the best public-houses in the northern suburbs, by the many who are attracted each year by the lovely scenery which is to



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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1873.

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Water-Testing Apparatus for detecting Impurities in Water, 10*s.* 6*d.* and 21*s.* each.

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be met with in that part of Middlesex. In re-erecting the building to meet the needs of the increasing number of visitors the whole premises have been enlarged. On the ground floor are spacious public and private bars, and also private sitting-rooms, &c., and on the first floor a coffee-room capable of seating 150 persons is provided, besides a private dining-room and other apartments; the verandah is entered from this coffee-room. The second floor is occupied by bedrooms, and also the kitchen, &c., are on the upper floor. The building is erected of red bricks, and covered with brindled Broseley tiles; the hay-loft over stables and the gables to main building have half-timbered and rough-cast treatment. The contract was taken by Mr. S. Goodall, of Stoke Newington, who has carried out the work in a very creditable manner; the bar-fittings and pewterer's work are by Mr. Heath, of London; Messrs. J. & J. King, of Norwich, supplied the stained-glass; Messrs. Waygood & Co., the dinner-lift; Messrs. Yates, Haywood & Co., the stoves and encaustic tiles. The plans were prepared by and the works have been carried out under the superintendence of Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, architects, of Norwich.

THE SANITATION OF SCHOOLS.

THE Education Department issued on Saturday to inspectors of schools a circular, and a form to be filled up by them in future at the annual inspection of schools. The form contains some thirteen questions, most of which refer to the site, structure, ventilation and sanitation of the school inspected. The following is the text of the circular:—"My lords are desirous of obtaining a fuller and more detailed statement than is given in the annual reports of Her Majesty's inspectors with reference to the condition, as regards buildings and apparatus, of each of the schools in England and Wales. I am, therefore, to request that you will, at each of your annual visits to schools during the year beginning February 1, 1893, complete and file with form 10 one of the accompanying forms. It is, of course, not to be understood that in every case where the school is to some extent defective in one or more of the points mentioned in the form you are required to press for an immediate alteration. In that matter you will, as heretofore, use your discretion. At the same time, any serious defect in the convenience of the school for teaching purposes or in its sanitation should be brought under the notice both of the

managers and of the Department, with a view to its immediate removal. The object aimed at by the form is twofold—first, the answers to the questions are intended to show, with the view of enabling the Department within a reasonable limit of time to secure complete efficiency, how far each existing school falls short of modern requirements in any of the points mentioned; and secondly, they will furnish a complete statistical record of the condition of the school premises throughout the country. Those answers should not, therefore, be modified by any special circumstances affecting a school, or by the fact that it may formerly have received a building grant."

WESLEYAN CHAPEL BUILDING.

THE annual report of the Wesleyan Chapel Committee, about to be issued, shows that the ordinary income of the fund from collections, subscriptions, &c., is 8,933 $\frac{1}{2}$ l. The relief loan fund amounts to 46,000 $\frac{1}{2}$ l., and the erections loan fund to 50,000 $\frac{1}{2}$ l. During the past year a total of 14,505 $\frac{1}{2}$ l. has been advanced from these two funds. Since the last report the committee have sanctioned 355 cases in all—viz. 120 chapels, at an estimated cost of 167,584 $\frac{1}{2}$ l.; 20 ministers' houses, 18,734 $\frac{1}{2}$ l.; 17 school-rooms, 12,677 $\frac{1}{2}$ l.; 111 alterations and enlargements, 53,059 $\frac{1}{2}$ l.; 53 modifications of cases previously sanctioned, viz. 32 chapels, additional outlay, 12,598 $\frac{1}{2}$ l.; three ministers' houses, 467 $\frac{1}{2}$ l.; 18 alterations and enlargements, 3,698 $\frac{1}{2}$ l.; 34 organs, 9,919 $\frac{1}{2}$ l.—making a total estimated expenditure of 278,736 $\frac{1}{2}$ l. The proposed new chapels, with the enlargements and other works, will give sitting accommodation for 21,290 additional persons. The temporary debt sanctioned is 47,916 $\frac{1}{2}$ l. During the year 319 other cases have been reported through the district synods, upon which 309,204 $\frac{1}{2}$ l. have been expended. These are now returned as completed cases, and the additional accommodation represented in these returns is 21,199 sittings. A number of valuable gifts of chapels and other trust property has been reported. The debt, including loans from connexional funds in process of repayment, is stated to be 808,767 $\frac{1}{2}$ l. The total amount expended on Wesleyan trust property and in reduction of debt during the year is 378,137 $\frac{1}{2}$ l. Since the formation of the fund thirty-eight years ago debts have been discharged by local efforts and surplus income grants and loans amounting in the aggregate to 2,169,293 $\frac{1}{2}$ l. The net amount actually contributed in Great Britain this year, as reported, is 292,583 $\frac{1}{2}$ l.

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RATING OF OWNERS OF PROPERTY IN LONDON.

THE Bill which has been lodged by the London County Council to authorise a new rate upon the owners of property in London contains the following provisions:—

The preamble recites that the burden of the cost of permanent improvements and works effected by the London County Council unduly presses and will press upon the occupiers of houses and tenements within the county unless specially provided for, and that therefore it is expedient that the Council should have power to levy a new rate, as hereinafter provided.

Clause 2 defines "hereditaments" to include all lands, tenements and hereditaments within the county.

The New Rate.

Clause 3 enacts that there shall be leviable in respect of hereditaments throughout the county a rate to be called "The County Improvements Rate," or such other name as the Council may determine, the proceeds of which shall be applicable by the Council as follows:—

1. In providing one-half of the sums required in each year for redemption of stock, or repayment or replacement of money borrowed and expended on capital account, for the purposes of the following improvements, if the same be authorised by Parliament, viz.:—(a) The new central street from Southampton Row to the Strand, with the subsidiary streets and works; (b) the new approach to the Tower Bridge, in the parishes of Bermondsey and St. John, Horsleydown, and (c) the ferry between Rotherhithe and Ratcliff, described in and proposed to be authorised by the London Improvements Bill now pending in Parliament.

2. In payment of the sum required in each year for payment of interest and charges in respect of one-half of the money so borrowed and expended.

3. In providing the sums required in each year for redemption of stock, or repayment or replacement of money borrowed for and expended on any permanent improvements and works of public utility effected, or to be effected, by the Council and charged to capital account, and in payment of the sum required in each year for payment of interest and charges in respect of money so borrowed and expended.

The expression "permanent improvements" in this section means any works of which the Council have power to spread

the cost, and of which they resolve to spread the cost, over a period of at least fifty years.

Estimate for Rate.

Clause 4 provides that the Council, when estimating or revising the estimate of the amount which they will require to raise in each financial year by contributions, to meet the expenditure for general county purposes, shall estimate the amount which may require to be raised by means of the County Improvements Rate, to meet the expenditure to be defrayed out of moneys raised by that rate during the same year, and the amount so estimated shall be taken into account in ascertaining the amounts to be levied by contributions in respect of expenditure for general county purposes, and such estimate shall be open to inspection by any person without payment, and shall be conclusive for all purposes whatsoever.

Collection of Rate with Property Tax.

Clause 5 enacts that, if any agreement is arrived at between the Treasury and the Council with respect to the collection of the Improvements Rate, the following provisions shall have effect:—

Limitation of Rate.

1. The Council may fix and determine in respect of each financial year the amount of the rate in the pound on the gross value of lands, tenements, hereditaments and heritages in the county, which in their judgment will be necessary to produce the amount required to be levied in respect of that year as the County Improvements Rate, and such rate shall be charged upon the value at which such lands, tenements, hereditaments or heritages within the county are assessed for the payment of property-tax, but shall not exceed the rate of fourpence in the pound upon such value. The rate shall be demanded and collected along with the property-tax.

Collection.

2. On or before the 1st day of November in each year, the Council shall furnish to the Commissioners of Inland Revenue a certificate stating the amount in the pound in respect of such value as they have resolved should be levied as the Improvements Rate, and a separate column shall be provided in the Demand Note for Property Tax which shall specify separately the amount to be collected in respect of the Improvements Rate.

3. Every occupier of any lands, tenements, hereditaments,

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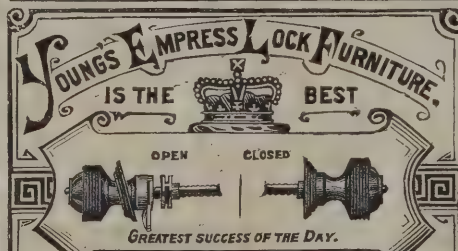


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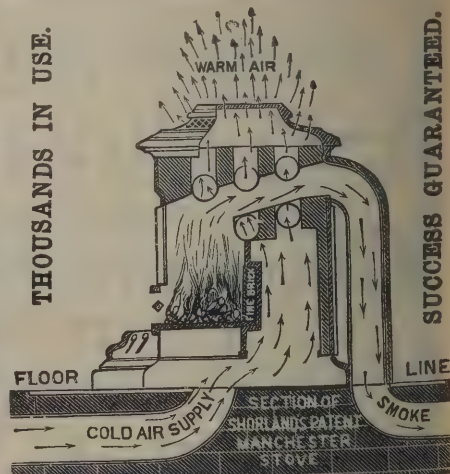
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or heritages, being tenant of the same, and paying the Improvements Rate, shall deduct from the rent payable by him to the landlord, for the time being, an amount in the pound after the rate at which the Improvements Rate is fixed, and every such deduction shall be allowed in the same manner as a deduction from rent in respect of property tax.

Collection of Rate by Rating Authorities.

Clause 6 provides that, in the event of no agreement being arrived at between the Council and the Treasury as to the collection of the Improvements Rate, then the following provisions shall have effect :—

Precepts.

1. The amounts which the Council require to be levied by means of the Improvements Rate may be demanded by the Council by the precepts by which they demand county contributions for the purpose of the County Rate.

Limitation of Rate.

2. The amounts required to be levied by means of the County Improvements Rate shall be stated in the precepts of the Council separately from the amounts required for contributions for general county purposes, or special county purposes, and shall not in the case of any parish or place exceed a sum equivalent to fourpence in the pound on the total of the gross value of the hereditaments.

Places not in Metropolitan Unions.

3. As regards any parish or place within the county not included in the unions subject to the Valuation (Metropolis) Act, 1869, the amount of the contributions required by the Council to be levied by means of the Improvements Rate shall not exceed a sum equivalent to fourpence in the pound on the gross value of the hereditaments in such parish or place, according to the Valuation List for the purpose of assessment for the relief of the poor.

Collection.

4. The several authorities and persons empowered to levy and collect the county rate shall levy and collect the amount required for contributions under this Act, along with the rate for general county purposes, and in any demand note the amount stated to be levied in respect of the County Improvements Rate shall be distinguished from the amount stated to be levied for other purposes.

Occupier to be Entitled to Deduct.

5. Where the occupier of rateable property in the county is liable to pay a rent in respect thereof, he shall, in the first instance, pay the County Improvements Rate, but he shall be entitled to deduct from such rent an amount in the pound equal to the rate at which the Improvements Rate is fixed; and where a person entitled to receive a rent in respect of which any such deduction shall have been made is also liable to pay rent in respect of the same rateable property, or any part thereof, he shall be entitled in his turn to deduct from any rent payable by him in respect of the same property an equal amount in the pound.

Rating of Unoccupied Buildings and Vacant Land.

Clause 7 enacts that the Improvements Rate shall be assessed and payable in respect of unoccupied houses and buildings and of vacant land, including land on which there are uncompleted buildings, as well as in respect of houses and buildings which are occupied, and of other land, and shall, so long as the house, building or land upon which the rate is charged remains unoccupied or vacant, be payable by the owner thereof on demand. If and so far as at the commencement of a new tenancy or occupation of any house or building or land any arrears of the Improvements Rate remain due in respect thereof, then such arrears shall be payable on demand by the first tenant or occupier, or any succeeding tenant or occupier thereof, and any tenant or occupier who shall have paid such sum may deduct the amount paid by him in respect of such rate out of any rent payable by him in respect of the house, building or land.

Valuation of Unoccupied Buildings and Vacant Land.

Clause 8 provides (1) that the overseers and assessmen committees acting under the Valuation (Metropolis) Act, 1869 shall, in making out the next valuation list or supplemental valuation list, include or add and assess all unoccupied houses and buildings and vacant land, including land on which there are uncompleted buildings, so far as such houses, buildings and land would not, but for the provisions of this Act, be included in such lists, and shall cause the totals of the gross and rateable values of such buildings and lands to be ascertained and included in all valuation lists made after the passing of this Act. (2) As regards any parish or place within the county not included in the unions subject to the Valuation (Metropolis)

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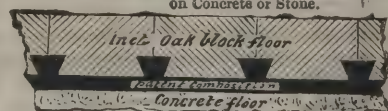
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Act, 1869, the separate valuation and assessment of uncompleted and unoccupied houses and buildings, and vacant lands, shall be made and prepared in like manner as for the county rate.

Right of Appeal, &c.

Clauses 9, 10 and 11 merely extend the existing right of appeals against the valuation made in respect of unoccupied buildings and vacant land, and also extend the provisions of the Local Government Act, 1888, so far as they are applicable to raising the rate for county purposes, to the raising of the County Improvements Rate, and also provide for the Council keeping separate accounts of the sums raised by the Improvements Rate.

No Power for Landlord to Contract Himself out of the Rate.

Clause 12 enacts that the County Improvements Rate shall be a charge and encumbrance on the freehold of the hereditaments in respect of which it is made, and shall not be a rate or outgoing payable by a tenant or occupier within the meaning of any existing contract. Any deed, agreement, covenant or contract made after the passing of this Act, purporting to deprive or which would have the effect of depriving, any tenant or other person of his right under this Act to deduct the Improvements Rate paid by him from the amount of his rent, or tending to defeat the intention of this Act, shall, so far as it purports to have that effect, be void.

BATH MUNICIPAL BUILDINGS.

THE Bath Town Council have adopted the following report by the Municipal Buildings Committee:—Your committee have now received the revised estimate for the south wing of the new buildings in accordance with the altered plans sanctioned by the Council. Messrs. Hayward & Wooster have gone through all the variations from the original drawings, and the result is that the present estimate amounts to 22,525*l.*, an excess of 27*l.* over the former figures. It will be observed that although the length of the wing is diminished, there are considerable alterations in the structure, and some additions to it on the site of the market to supply the accommodation abstracted from the original design and give a wider roadway opposite the abbey. The entrance hall is now under the tower in the High Street front and not on the circular south-west

angle as formerly. The new court room and the council chamber are removed further north so that they now abut against the wall of the present Guildhall. And the jury retiring-room formerly between the new court and the Guildhall is now projected out at the back over a portion of the market site. Mr. Brydon having stated that everything has been most carefully measured and priced out, the committee have no hesitation in recommending that contracts be completed with Messrs. Hayward & Wooster on the basis of the present estimate, and that the work be commenced as soon as possible. Considerable progress has been already made in the demolition of houses opposite the abbey. The necessary order has been made by the Recorder for closing Boatstall Lane. The committee further report that Mr. Brydon has submitted for their inspection the revised plan of the north wing, and that he hopes they will be completed in the course of next week, so as to be submitted to the Council at the February meeting.

TECHNICAL TRAINING FOR PAINTERS.

THE national united conference of masters and workmen belonging to the house-painting and allied trades was held on Monday, Tuesday and Wednesday of last week, at the Painter-Stainers' Hall, Little Trinity Street, E.C.

At the inaugural meeting on Monday evening Mr. Harris Heal, master of the Painter-Stainers' Company, who presided, alluded to the history of the company, and described its connection with the art of painting in the past, and what it had done to assist members of the trade financially. He also referred especially to the importance of technical instruction, and instanced the Lord Mayor, who, as the Master of the Plumbers' Company, the one company which had taken up the question of registration in the trade it represented, had aided the company in the question of technical education.

The Lord Mayor replied the work they were undertaking was the work that he should be glad to see undertaken by every guild in the City of London. The Plumbers' Company, of which he was the Master, had been most successful in the steps which they had taken to improve the trade by issuing certificates after examination, and he was glad to hear a suggestion that the Painter-Stainers' Company proposed to follow a similar course. He thought that the painter's craft was one that should be especially encouraged to take its proper place as an art. The technical worker in painting should be an

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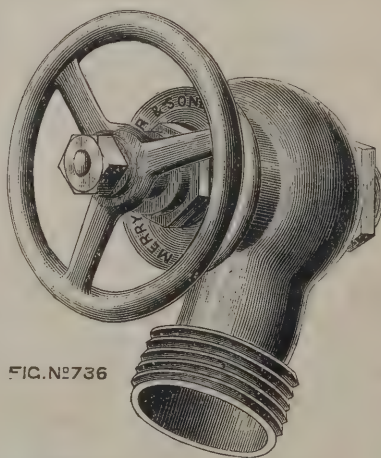


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artist in his own way, and decorative painting should be treated in a manner pleasing to the eye and to the senses, and devoid of all vulgarity.

Mr. W. G. Sutherland, of Manchester, read a paper on "The Need for Better and more Systematic Training in the Painting Trade," and pointed out that while in the North of England and in Scotland the plan of indenturing boys to the trade had been adhered to, in the Midlands and the Southern counties the plan had fallen into disuse. Left to their own resources boys entered the trade, and were allowed to pick up their knowledge in any way, ultimately drifting into the big army of inefficient. The readiness with which a superficial knowledge of the trade was acquired acted as a stimulus to men to fly to it as a resource when other means failed. What they stood in need was that learners should be thoroughly instructed in a knowledge of their materials; that they should be familiar with the best methods and processes employed in the trade; that attainment to a certain standard of knowledge and executive skill entitled them to a certificate of qualification; and that the diploma should bear the imprimatur of a London organisation representative of the trade and possessed of sufficient authority and prestige to give a distinctive value to the certificate.

Sir A. K. Rollit, M.P., who next spoke, advocated the establishment of commercial museums, and observed, in regard to technical education, that no one could see what had taken place in other countries without feeling the need of greater technical education in our own.

Mr. Joseph Rogers (Battersea branch of Amalgamated Society) said Mr. Sutherland's paper exactly pictured the present condition of the trade. The blame could, he thought, be laid entirely on the employers.

Mr. H. Barker thought the sole cause of the present condition of the trade was due to the employer. Technical education was all very well, but there were many men of good ability who had no opportunities for displaying their powers. If employers were content to take less profit, men would be able to take more time, be better paid, and do sounder work. All the jerry building and rascality of the capitalist class was due to the present competition system.

Mr. W. H. Bailey, of Hull, said that the problem to be solved was how to bring back the demand for good work, so that when greater ability was displayed there would be opportunity for employing it. If the masters were determined to assist the men, they could rely on being heartily supported.

Mr. J. Puttrel, of Sheffield, as an employer, said while masters were responsible for some of the blame, a portion also attached to the men. Masters were desirous of having work done well, but they were often thwarted. If workmen and masters would only pull together they would, however, be more successful.

Mr. A. Purser, Universal Federation, said one reason for the disreputable work done was the low estimates put in, and the sub-contracting below that, whereby to recover ground a coat of paint had to be omitted.

Papers on "How Best to Stimulate an Interest in our Trade in the Young," contributed by Mr. Thomas Lough, M.P., and by Mr. W. A. Stewart, of the London Trades Council, were next read. The latter laid the blame of the general lack of interest amongst youths in technical details on the modern system of cramming adopted in our schools.

On Tuesday evening Colonel Robert J. Bennett, of Glasgow, presided. He advocated the development of evening trade classes for apprentices and operatives. A paper on "Trade Classes and their Management" was read by Mr. T. C. Millis, head-master of the Borough Road Polytechnic. He showed the increasing necessity for the establishment of trade classes, owing to the decadence of the apprenticeship system, and said the object of such classes should be to supplement and not to supersede the training gained in the workshop. To be successful, these classes must be heartily supported by the workmen.

Mr. William Fourniss, of Finsbury College, on the same subject, said the painting and decorative trades did not now hold the same position in public estimation they once did, partly because of the steady decline in apprenticeship, partly because of the lack of technical training in the workers, and the consequent falling off in average ability. The painters' trades unions ought, he urged, to seek to raise the level of the work done.

Mr. Donaldson, late of Gillow's, said apprenticeship was in London practically dead. The metropolitan employer wanted the finished article, and had no time to train raw youths, nor had he any necessity to do so, for there was a continuous supply of trained men flowing in from the provinces.

A long and exciting discussion followed from both workmen and employers. Mr. Joseph Rogers, of the Battersea branch of the Amalgamated Society, questioned whether a man possessing the highest technical knowledge of the principles of his trade would be treated with greater respect by an employer,

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and asked whether it was not the fact that such educated and skilled men were displaced by those who would scamp the work?

Mr. Sutherland deprecated recriminations on either side, as likely to destroy any hope of utility from the conference. Ultimately the workman who deserved respect for his superior ability and knowledge would gain it. An architect had told him that day that he had often to select a workman little better than a labourer, because he had a better perception of colour than others who perhaps possessed greater technical knowledge, and could more intelligently carry out orders.

Mr. Edward Bell, of Kentish Town, as an employer, held that all practical master painters knew the value of a skilled man and treated him accordingly; but the few employers of this sort in London were swamped by the large number of men who had come into the trade as a mere means of living, and who would take contracts, often at less rates than the cost of labour and materials.

After remarks from Mr. M. C. Cowtan, of Oxford Street, Mr. G. W. Argent, Regent's Park, Mr. Barker and Mr. W. E. Steward, Mr. Millis, in replying upon the discussion, expressed regret that at this and all other conferences on technical education he had attended, consideration of the main issue had been impeded by discussions of the existing relations between employer and employed.

Papers on "Is it desirable to establish a System of Registration and to grant Diplomas of Merit?" were read by Messrs. David Laing and George Kilpack. After discussion the following resolution was unanimously adopted:—"That in the opinion of this conference it is desirable that some system of registration for masters and workmen be established."

On Wednesday evening Mr. J. Hunter Donaldson presided. In the absence of Mr. J. D. Crace, through illness, a short paper on the prospects and position of the craft was read for him by Mr. Sutherland. Two papers entitled "Proposals for Establishing a New Organisation" were then read, the first by Mr. A. Chappell, and the second by Mr. A. Gaiger.

After a stormy discussion the following resolution was adopted:—"That in the opinion of this conference it is desirable, in the interests of the painting trade, that there be some central organisation (with auxiliary branches throughout the country), possessed of sufficient prestige and authority to issue diplomas or certificates of technical ability to candidates for the same, whether masters or men; that it be the respectful petition of this conference to the master, wardens and court of

the Painters' Company that the court takes into its earnest consideration the question whether it would not be possible for the company to provide facilities for giving effect to the above; and that a consultative committee, consisting of an equal number of employers and workmen, be appointed from this conference to meet and confer with a committee of the company, and to issue a report thereupon to the individuals and societies represented at this meeting," and the following were appointed as a committee to co-operate with the court of the Painters' Company:—Messrs. George Kilpack, E. C. Gibbs, Foy, Chappell, Yallop, J. Laing and M'Dowall, with power to add to the committee.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 406. Lewis Lee Gough, for "A draught-preventer."
- 416. Leon Napoleon Loeb, for "Improved apparatus for automatically preventing the overflow of baths, sinks and similar receptacles."
- 460. William Henry Green, for "Hydraulic main cock."
- 535. William Henry Adams Davidson, for "Improvements in ventilating fans or wheels."
- 550. Alexander Guild, for "Improvements in pulleys."
- 616. Thomas Marcus Houghton, for "Improvements in fire-guards for grates."
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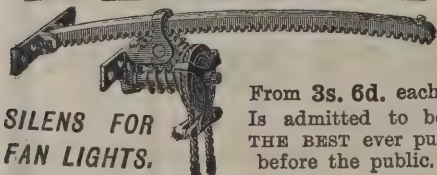
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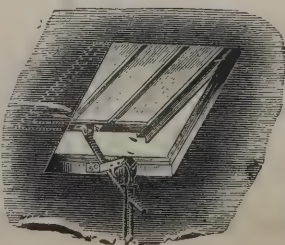
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CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

WAKEFIELD.—Feb. 1.—Designs are invited for the Erection of Council Chamber, Committee Rooms and Offices. Mr. F. Alvey Darwin, Clerk of the Peace, West Riding Offices, Wakefield. Premiums of 200l., 100l. and 50l.

WINSFORD.—Feb. 13.—Designs, Estimates, &c., are Invited for Proposed Technical Schools and Gymnasiums. Premiums of 50l., 15l. and 10l. Mr. J. Cowley, Secretary, 38 Witton Street, Northwich.

CONTRACTS OPEN.

ABERDEEN.—Feb. 8.—For Building Police Offices, Lodge Walk. The City Architect, 224 Union Street, Aberdeen.

ASHBY.—Feb. 6.—For Construction of Brick Settling Tank, Filter Bed and other Works. Mr. J. W. Metcalf, Surveyor, 31 Tamworth Road, Ashby-de-la-Zouch.

ASHTON-UNDER-LYNE.—For Building Shop and Five Houses. Messrs. T. George & Son, Architects, Old Square, Ashton-under-Lyne.

BARROW.—For Building Residence. Messrs. Settle & Farmer, Architects, Cornwallis Street, Barrow.

BELFAST.—Feb. 3.—For Building Thirteen Houses. Mr. Vincent Craig, Architect, 5 Lombard Street, Belfast.

BELFAST.—Feb. 14.—For Building Workers' Dwellings, Greencastle. Messrs. Young & Mackenzie, Architects, 7 Donegall Square East, Belfast.

BISHOP'S CASTLE.—Feb. 20.—For Construction of Concrete Service Reservoir and Supplying Iron Water Mains. Mr. R. L. Bamford, Surveyor, 138 Widemarsh Street, Hereford.

BRADFORD.—Feb. 10.—For Building Warehouse. Mr. T. C. Hope, Architect, 27 Kirkgate, Bradford.

BRIDGEND.—Feb. 14.—For Building Chancel Organ-chamber and Vestry. Mr. E. M. B. Vaughan, Architect, Cardiff.

BRIGHOUSE.—Feb. 15.—For Building Two Shops and Extensive Warehouses. Messrs. Sharpe & Walter, Architects, 18 Bradford Road, Brighouse.

BURNLEY.—Feb. 8.—For Plumbing, Glazing, Painting and Hot-water Apparatus, for New Workhouse Infirmary. Mr. S. Keighley, Architect, Nicholas Street, Burnley.

BURNLEY.—Feb. 8.—For Renovating Interior of Chapel. Mr. E. Redman, 191 Cog Lane, Burnley.

BURRATON.—Feb. 13.—For Building Wesleyan Chapel and School. Mr. J. A. Parkes, Bronsley House, Burraton, Saltash.

CALEDONIAN RAILWAY.—Feb. 6.—For Station Buildings and Goods Sheds. Messrs. Strain, Robertson & Thomson, C.E., 154 West George Street, Glasgow.

CARLISLE.—Feb. 7.—For Plastering (Robinson's Cement) and Fireproof Flooring at Asylum. Mr. G. D. Oliver, County Architect, The Courts, Carlisle.

CORK.—Feb. 9.—For Building Labourers' Cottages. Mr. P. McGrath, Executive Sanitary Officer, Cork.

COVENTRY.—Feb. 13.—For Engineer's Work of Heating and Hot and Cold Water Supplies, and for Slipper Baths and Fittings, Lavatory Fittings and Laundry, at Public Baths. Messrs. Spalding & Cross, Architects, 15 Queen Street, Cheapside, E.C.

CORWEN.—Feb. 4.—For Building Four Houses. Mr. John Williams, Architect, Dee View, Corwen.

DARTMOUTH.—Feb. 18.—For Excavating Trenches, Supplying, &c., Cast-iron Pipes, Hydrants, Valves, &c., Constructing Service Reservoirs and Filters. Mr. T. O. Veale, Borough Surveyor, Dartmouth.

DOVER.—Feb. 7.—For Construction of Engine-house, &c., at Drainage Works. Mr. E. Wollaston Knocker, Town Clerk, Dover.

DUNDALK.—Feb. 13.—For Construction of Sewers. Mr. J. Gaskin, Surveyor, Town Hall, Dundalk.

EAST THURROCK.—Feb. 15.—For Building Hospital Pavilions, and for Additions, &c., to Workhouse at Orsett. Mr. Charles Pertwee, Architect, Chelmsford.

EBBW VALE.—Feb. 8.—For Building Dwelling-house with Boundary Walls, &c. Mr. Roderick Watkins, 9 Eureka Place, Ebbw Vale.

EDINBURGH.—Feb. 7.—For Constructing and Furnishing Ladies' Lavatory, Cockburn Street. The Burgh Engineer, 1 Parliament Street, Edinburgh.

ELLON.—Feb. 15.—For Construction of Bridge at Kin-harrachie. Mr. W. Davidson, District Surveyor, Ellon.

ETON WICK.—Feb. 9.—For Additions to Bell Cottages. Mr. G. H. Long, 4 Park Street, Windsor.

KIBWORTH HARCOURT.—Feb. 7.—For Erection of Lych-gate Building at Burial Ground. Messrs. Keites & Fosbrooke, Surveyors, 16 Market Street, Leicester.

KIDWELLY.—Feb. 10.—For Additions to Llandry House. Mr. T. Arnold, Stepney Street, Llanelly.

FINSBURY PARK.—Feb. 21.—For Building Chrysanthemum House. The Architect to the County Council, Spring Gardens, S.W.

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HOMERTON.—Feb. 22.—For Alterations to Mortuary and Works at Eastern Fever Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

KENDAL.—Feb. 14.—For Building First Two Blocks of Twelve Dwelling-houses. Mr. John Hutton, Architect, Kendal.

LAMBETH.—Feb. 9.—For Construction of Underground Urinal. The Surveyor, Lambeth Vestry Hall, Kennington.

MANCHESTER.—Feb. 9.—For Additions to Horse Hospital. The Engineer's Office, London Road Station, Manchester.

MERTHYR TYDFIL.—Feb. 7.—For Building School. Mr. Morgan, Master, Workhouse, Merthyr Tydfil.

MIDDLETON.—Feb. 8.—For Building Parsonage. Mr. John F. Curwen, Architect, Kendal.

MOUNT PLEASANT.—Feb. 20.—For Second Portion of Parcel Post Office. H.M. Office of Works, 12 Whitehall Place, S.W.

NOTTINGHAM.—Feb. 3.—For Additions to School of Art. Mr. Arthur Brown, Borough Engineer, Guildhall, Nottingham.

OTTERBOURNE.—Feb. 4.—For Building Police-station. Mr. J. Cresswell, County Architect, Moot Hall, Newcastle-on-Tyne.

OXFORD.—Feb. 7.—For Erection of Municipal Buildings. Mr. Henry T. Hare, Architect, 1 York Buildings, Adelphi, W.C.

PORTSMOUTH.—Feb. 21.—For Construction, Alterations and Reparation of Sewers, for the Urban Sanitary Authority. Mr. Alexander Hellard, Town Clerk.

PRESTON.—Feb. 11.—For Superstructure of Cross Deaf and Dumb School. Messrs. Sames & Green, Architects, 65 Northgate, Blackburn.

RAWTENSTALL.—Feb. 9.—For Building Co-operative Stores. The Secretary, Conservative Industrial Co-operative Society, Rawtenstall.

ROSCOMMON.—Feb. 18.—For Supplying and Fixing Three Porcelain Enamelled Baths. Mr. J. J. Shiel, Secretary, Roscommon County Infirmary.

SEDGLEY.—Feb. 18.—For Additions to Board Schools. Mr. A. P. Brevitt, Architect, Red Lion Street, Wolverhampton.

SHIPLEY.—Feb. 4.—For Building Four Houses and Shop. Mr. S. Jackson, Architect, Tanfield Chambers, Bradford.

SMETHWICK.—Feb. 8.—For Additions at Public Buildings. Mr. J. C. Street, Surveyor, Public Buildings, Smethwick.

SOUTHAMPTON.—Feb. 16.—For Enlargement of Board Schools, Sholing. Messrs. W. H. Mitchell, Son & Gutteridge, Architects, 9 Portland Street, Southampton.

SOUTHEND.—Feb. 14.—For Building Club House. Mr. E. Wright, Architect, High Street, Southend-on-Sea.

STRATFORD.—Feb. 14.—For Construction of Underground Urinal. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

TONYPANDY.—Feb. 11.—For Additions to Independent Church. Mr. O. M. Roberts, Architect, Portmadoc.

TREHARRIS.—Feb. 8.—For Enlarging Chapel. Mr. E. E. Watkins, Grocer, Penn Street, Treharris.

WALSALL.—Feb. 14.—For Building Board Schools. Messrs. Bailey & McConal, Architects, Bridge Street, Walsall.

WALTHAMSTOW.—Feb. 17.—For Building Board Schools, Forest Road. Mr. W. A. Longmore, Architect, 7 Great Alie Street, Whitechapel.

WATH-ON-DEARNE.—Feb. 13.—For Building Wesleyan Chapel, Schools, &c. Mr. J. Wills, Architect, Victoria Chambers, Derby.

WEST ARDSLEY.—Feb. 6.—For Building Stores, Dwelling-houses, Outbuildings and Boundary Walls. Mr. John H. Brearley, Architect, Commercial Street, Batley.

WIMBLEDON COMMON.—Feb. 7.—For Pulling Down and Rebuilding Windmill. Mr. Jesse Reeves, Manor Cottage Wimbledon Common.

WORKINGTON.—Feb. 11.—For Building Two Houses. Mr. W. G. Scott, Architect, Victoria Buildings, Workington.

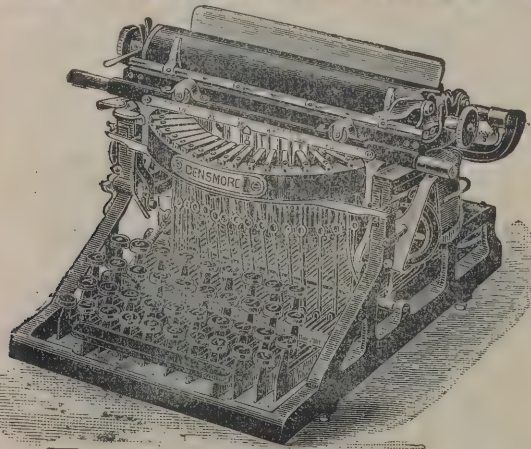
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For Additions to Schools at Barncoose, for the Illogan School Board. Mr. SAMPSON HILL, Architect, Redruth.

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W. Odgers	558	10	0
A. Nicholls & Son	489	0	0
Hancock & Chirgwin	488	0	0

Masonry, &c.

W. Gray	410	0	0
W. BURNETT (accepted)	270	0	0

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John Roberts	198	0	0
W. H. Moyle	194	0	0
E. J. STONEMAN (accepted)	159	0	0

KENDAL.

For Building County Police Station. Mr. SHAW, Architect, Kendal.

Accepted Tenders.

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G. F. Martindale, joinery	323	10	0
W. Jackson, plumbing, glazing, &c.	147	15	0
B. Davis, plastering	88	0	0
Thornton Bros., Outley, slating	83	0	0
T. Cordingley, concrete floors	35	0	0

LONDON.

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McCormick & Sons	91	0	0
Houghton & Son.	81	0	0

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For Construction of 980 feet of 12-inch Stoneware Pipe Sewer, Colebrooke Row, and 170 feet, Halton Road, with Man-holes, Lampholes, &c., for the Vestry of St. Mary, Islington. Mr. J. PATTEN BARBER, Surveyor.

E. Parry, Walham Green	£796	16	8
F. A. Jackson & Co., Stroud Green Road	616	15	5
Wilkinson Bros., Finsbury Park	589	6	4
W. Walker, Upper Holloway	474	16	5
T. Williamson, Hornsey	465	5	3
T. Adams, Hornsey Road	445	11	8
C. W. KILLINGBACK & Co., Camden Town (accepted)	439	3	3

For Alterations and Repairs to Business Premises, 252 Euston Road. Mr. THOMAS DURRANS, A.R.I.B.A., Architect, 44 Upper Baker Street.

J. Stevens	£1,187	0	0
Myring & Co.	1,180	0	0
Dearing & Son	995	0	0
W. Thomas	920	0	0
J. Edgar	916	0	0
J. Carmichael	895	0	0
H. C. CLIFTON (accepted)	893	0	0

For Works necessary in Underpinning the East End of All Saints Church, Blenheim Grove, Peckham. Messrs. INSKIP & MACKENZIE, Architects, 5 Bedford Row.

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Colls & Sons	285	0	0
W. Downs	254	0	0
Watson	248	0	0
Kirk & Randall	238	0	0
Parker	230	0	0
Brown, Son & Blomfield	220	0	0

G. Ellyatt (declined).

For Making-up Carriageway in Gladsmuir Road, Upper Holloway, for the Vestry of St. Mary, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.

F. French, Liverpool Road	£445	0	0
F. A. Jackson & Co., Stroud Green Road	417	0	0
T. Adams, Hornsey Road	378	0	0
W. Walker, Upper Holloway	354	13	0
T. WILLIAMSON, Hornsey (accepted)	339	15	0

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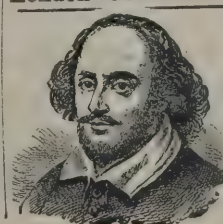
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I. Barton, Ryde 1,120 0 0
W. Newman, Ryde 1,030 0 0
C. Langdon, Ryde 998 0 0
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I. BARTON, Ryde (accepted).

PLYMOUTH.

For Pulling-down and Rebuilding Western, Southern and Eastern Walls of Hartley Reservoir and other Works, for the Plymouth Corporation. Mr. E. SANDEMAN, Water Engineer.
W. Trevena, Plymouth £10,948 0 0
W. C. Shaddock, Plymouth 9,678 0 0
W. T. Jenkin, Plymouth 9,665 7 6
G. Shillabear, Plymouth 9,600 0 0
Williams & Westlake, Stonehouse 9,394 12 6
Tozer & Son, Plymouth 9,374 14 6
T. Shaddock, Plymouth 9,171 16 0
Pethick Bros., Plymouth 9,153 0 0
A. N. Coles, Plymouth 9,047 5 5
J. Shaddock, Plymouth 8,711 7 0
C. L. DUKE, Plymouth (accepted) 8,639 13 6

RYDE.

For Addition to Woodlands Vale, near Ryde, for General the Hon. Somerset J. G. Calthorpe. Mr. STEPHEN SALTER, jun., F.R.I.B.A., Architect, Pondwell, near Ryde.
I. BARTON, Ryde (accepted).

ST. HELENS.

For Decorations, Alterations and Additions to The Priory, St. Helens, I.W., for the Lord of the Manor. Mr. STEPHEN SALTER, jun., F.R.I.B.A., Architect, Pondwell, Ryde.

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A. R. CRIETH, Nettlestone, I.W. (accepted).

ST. GEORGE.

For Building Higher Grade and Technical School, St. George, near Bristol. Mr. F. BLIGH BOND, Architect, Liverpool Chambers, Corn Street, Bristol. Quantities by Mr. W. L. BERNARD, St. Stephen's Chambers, Bristol.
H. A. Forse £12,524 0 0
J. Perkins 12,130 0 0
G. Humphreys 11,740 0 0
Stephens & Bastow 11,499 0 0
Hatherley & Carr 11,497 0 0
S. Williams 11,431 13 10
G. H. Wilkins 11,420 0 0
Cowlin & Son 11,375 0 0
W. Brock & Son 11,300 0 0
W. Church 11,188 0 0
J. H. Brown 11,187 12 0
Bale & Westlake 11,045 0 0
Edwin Clark 11,040 0 0
R. Wilkins & Son 10,980 0 0
E. Walters 10,960 0 0
J. E. Davies 10,950 0 0
H. J. Rossiter 10,891 0 0
J. Porrott 10,858 0 0
C. A. HAYES* 10,773 0 0
A. J. Beaven 10,750 0 0
Love & Waite 10,564 0 0
J. Martin 10,500 16 4

* Accepted by the Board, subject to modification.

SWANSEA.

For Additions and Alterations to Temple Buildings, Swansea. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.
Dd. Jenkins, Swansea £450 0 0
Hy. Billings, Swansea 393 0 0
Bennett Bros., Swansea 355 0 0
THOMAS WATKINS & CO., Swansea (accepted) 350 0 0
For Additions and Alterations to Residence, Coedsaeson Estate, Sketty, Swansea. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.
Dd. Jenkins, Swansea £790 0 0
Bennett Bros., Swansea 685 0 0
THOMAS WATKINS, Swansea (accepted) 650 0 0

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PATENT GEYSER
BATH-HEATERS
51 QUEEN VICTORIA ST.
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SWANSEA—continued.

For Reconstruction of Sanitary Arrangements at the Sailors' Home, Swansea. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A., Architects, Swansea.

J. H. Geen, Swansea	£294	0	0
Dd. Jenkins, Swansea	293	0	0
Thomas Watkins & Co., Swansea	280	0	0
J. & F. WEAVER, Swansea (accepted)	255	0	0

For Stables, Coach, &c., Langland, near Swansea. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., & GLENDINNING MOXHAM, M.S.A.

Dd. JENKINS, Swansea (accepted).

WEST HAM.

For Building Board Schools, Star Lane, West Ham, to accommodate 1,556 Children, including Cookery and Laundry Centres, for the West Ham School Board. Messrs. J. T. NEWMAN & JACQUES, Architects to the Board, 2 Fen Court, E.C. Quantities by Messrs. R. L. CURTIS & SONS.

J. Catley	£20,987	0	0
G. J. Hosking	20,745	0	0
J. Morter	20,718	0	0
Reed & Son	20,403	0	0
Hearle & Farrow	18,967	0	0
G. Sharpe	18,634	0	0
W. J. Maddison	18,530	0	0
GREGAR & SON (accepted)	18,220	0	0

WEST STANLEY.

For Building West Stanley Police Station, Durham. Mr. W. CROZIER, County Architect, Shire Hall, Durham. Quantities by Mr. J. E. MILLER, 1 Tunstall Road, Sunderland.

E. & J. R. Taylor, Durham	£3,000	6	0
Westgarth & Brown, Blackhill	2,913	2	3
J. Elliott, North Shields	2,864	0	0
T. Gibson, Consett	2,806	11	7
J. Storar & Son, Jarrow	2,759	13	6
F. Caldcleugh, Durham	2,740	10	0
W. C. Atkinson, Stockton-on-Tees	2,706	16	0
T. Hunter, Washington	2,678	15	0
W. Lodge & Son, Plawsworth	2,572	18	6
Graddon & Son, Durham	2,551	15	9
J. SHEPHERD, Durham (accepted)	2,530	0	0
T. Hilton, Bishop Auckland	2,528	4	0

WHITEMOOR.

For Infants' Room, Addition to Building in course of Erection at Whitmoor, for the St. Stephen's-in-Branwell School Board. Mr. S. HILL, Architect, Redruth.

WATTERS & GILBERT (accepted) £240 0 0

WIMBLEDON.

For Building Residence, for Mr. M. Yelf. Mr. STEPHEN SALTER, jun., F.R.I.B.A., Architect, Pondwell, Ryde.

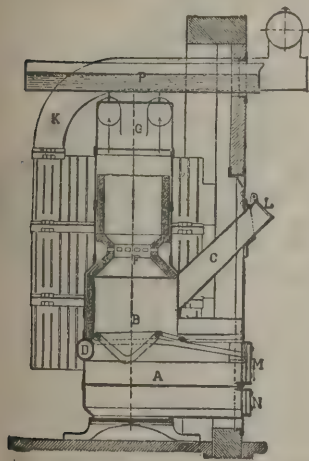
I. BARTON, Ryde (accepted).

CHICAGO EXHIBITION NOTES.

THE educational section of the Chicago exhibition will contain several interesting contributions by the School Board of Glasgow. The principal exhibit consists of the plans of Adelphi Terrace Public School, now in course of erection. When completed, this school, it is considered, will be the premier establishment of the kind in the city. The architect is Mr. T. L. Watson, whose design was selected as the result of a competition, and the various views given of the school, which comprise the basement, ground, first and second floors, longitudinal and transverse sections, and front and end elevation perspective, are presented in such a form as to convey a very adequate idea of what is being done in Glasgow in the way of school buildings.

THE committee of the Birmingham Art Gallery and Museum have granted, through the United States Commission, the loan of the Woolrich electric machine, now at Aston Hall, to Messrs. J. E. Hartley & Son, of St. Paul's Square, who will exhibit it at the World's Columbian Exhibition. As the forerunner of all the magnificent dynamos now so extensively used, this relic cannot fail to excite much interest in the United States, where Faraday's great discovery has had so many practical applications.

THE work of Public Elementary Schools is to be exemplified at the Chicago Exhibition by a display prepared by the London School Board. There will be models of London Board Schools, plans and elevations, drawing copy specimens, a museum cupboard removed from a London Board School, apparatus and books illustrating science teaching in the London Board Schools; examples of Kindergarten work and clay modelling, cardboard modelling, copper, brass and woodwork, &c.



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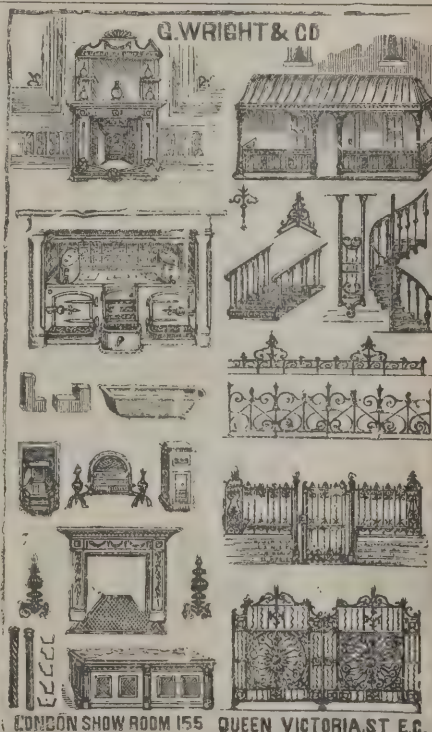
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THE following articles have been despatched this week from Sandringham to the Chicago Exhibition:—The Princess of Wales sends a beautiful corner chair in carved oak and cut cow-hide; the oak carving is by pupils of the Sandringham Technical School, and the leather was cut by her Royal Highness according to her own design. The Princess Victoria of Wales has forwarded a music-stool, with box-seat for books, &c., constructed to her designs in carved oak by the same school, and has worked the cut leather herself in single dahlias. Princess Maud of Wales has despatched a similar stool without the box-seat, and has herself worked the cut leather in sunflowers.

BUILDING AND BUILDERS.

AT the meeting of the Glasgow Dean of Guild Court, authority was given for the erection of over twenty tenements of dwelling-houses, besides a number of self-contained villas, within the city boundaries. The School Board of the parish of Eastwood were authorised to erect a new school at Shawlands, and the Corporation were granted leave to erect stables and workshops in Kelvinhaugh Street, Rowchester Street, Hozier Street and Baltic Street, in connection with their taking over of the tramway system in the city.

THE *Lincoln Chronicle* says it may now be taken as definitely settled that the new theatre will be erected on the site of the old structure. The proposed building will cover the site of the old Theatre Royal, and will also be extended over the King's Arms yard and the stables attached to the inn. Mr. Frank Matcham, London, is the architect.

ON Monday this week the Lord Mayor opened new premises, which have been built for the London Shipping Exchange, in Billiter Street, City, in place of the old Jerusalem. Messrs. Cubbitt, builders, carried out the work under the direction of the architect, Mr. Alex. R. Stenning.

AT the meeting of the sub-committee of the Leith Town Council, appointed to examine plans for the proposed new fever hospital for the burgh at East Pilton, plans for a fever hospital, to be erected on the cottage plan, were submitted by Mr. Simpson, architect. Mr. Simpson estimated that the buildings would cost about 20,000*l.*, and general furnishings, &c., about 4,000*l.* more, exclusive of the cost of the site, for which upwards of 3,000*l.* have been paid. The committee approved of the plans, with some slight alterations.

VARIETIES.

THE Queen has accepted a copy of Miss Whitmore Jones's book on "Games of Patience," which contains instructions for playing more than a hundred different games.

AT a joint meeting of the Technical Education and Public Meetings Committees of the Glasgow and West of Scotland District Council (Registration of Plumbers), held in Glasgow, Mr. David Thomson, architect, presiding, arrangements were advanced for the lectures to be delivered this session. Dr. Neil Carmichael, Examiner in Public Health to the Faculty of Physicians, is to deliver the first of those lectures in the end of February, treating the subject from the standpoint of a medical man and a sanitarian, while Mr. John Honeyman, F.R.I.B.A., will lecture in the end of the following month from the architectural side.

THE St. Helens Corporation are about to apply to the Local Government Board for sanction to the borrowing of 3,000*l.* for water-main extensions.

IT is stated that it has become necessary to line the Cynnyon tunnels, near Oswestry, on the Liverpool Vyrnwy pipe-line, with bricks, owing to a defect in the rock through which the tunnels are bored.

THE iron swing bridge erected by the Manchester Ship Canal Company to replace the old stone bridge which crossed the Irwell at Barton and connected the disturnpiked roads of that township with those of Stretford, Urmston and Flixton, has been temporarily opened for traffic. The Mayor of Eccles and several members of the Town Council met Mr. Radford, the county bridge master, and Mr. Charles Parker, resident engineer of the Ship Canal, on the new structure. It is expected to be ready for opening about June next. Messrs. Handyside & Co., Limited, are the contractors for the bridge.

AN inquiry has been held as to the application by the Southport Corporation for power to borrow 22,000*l.* for the improvement of the foreshore. The scheme includes the construction of a carriage drive on the seaward side of the south marine lake and the connection of the two lakes, to be spanned by an ornamental bridge. The foreshore enclosed by the drive is to be laid out as a marine park.

THE usual exhaustive and elaborate annual report on the meteorology of Nottingham by Mr. Arthur Brown, the borough engineer, and Mr. Philip Boobyer, medical officer of health, has just appeared. The health statistics of the borough may be

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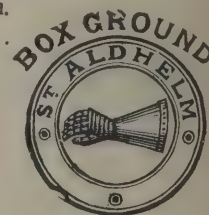
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studied with advantage in connection with the meteorological details scientifically shown on the accompanying chart.

THE Highgate Museum of Sanitary Appliances, which was recently opened by the Lord Mayor, was on Saturday last visited by Dr. F. J. Allan, medical officer of health for the Strand Board of Works, and the Shoreditch Vestry, accompanied by nearly thirty medical gentlemen. Great interest was taken in the museum, and the visit was much appreciated. The number of visitors during the past five weeks has been 2,162.

TRADE NOTES.

MESSRS. ARCHIBALD SMITH & STEVENS have received instructions to erect one of their Reliance passenger lifts in Jury's Hotel, Dublin, which is undergoing partial reconstruction. The same manufacturers have in hand a hydraulic lift for Messrs. Power & Co.'s distillery, Dublin; a handsome passenger lift for Mr. Peter Robinson's Regent Street show-rooms, London; a hydraulic lift for Messrs. J. & J. Field & Co.'s new factory, Lambeth; passenger and other hydraulic lifts for the Derbyshire Royal Infirmary, together with several large hydraulic passenger lifts for various buildings in the City of London.

MESSRS. BAIRD, THOMPSON & CO., ventilating engineers, of London and Glasgow, send us a copy of their new sheet of designs, calendar, &c., which they are issuing. The reverse side of the calendar is prettily got up in primrose and gold, and is a reproduction of the Grand Diploma of Merit (accompanied by the gold medal) this firm received at the Brussels Exhibition, at which exhibition they were granted the highest award for ventilators and ventilating appliances. We may mention that this firm has received the highest awards (1887-88-89-90-91-92) for improved systems of automatic and mechanical ventilation and ventilating appliances, *i.e.* fifteen gold medals and three grand diplomas of honour, having never been beaten at any exhibition.

TWO new fire-engines have been supplied to the Liverpool Watch Committee by Messrs. Merryweather & Co.

THE new hospitals, Devonport, are being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke-flues, the same being supplied by Mr. E. H. Shorland, of Manchester.

TO meet the requirements of amateur and other photographers Messrs. Marion & Co. have brought out "Marion's

New Fixing Cartridges," for fixing plates. These cartridges consist of pulverised hyposulphite of soda and theonine in correct proportions, and packed in specially prepared tubes. Being in powder they dissolve very quickly, and their portable form specially commends them to travellers and tourists.

THE North London Railway have decided to light the whole of their carriages with the "Coligny" lamp (the new patent gas roof-lamp, of the Lamp Manufacturing Co., Limited, Leonard Street, City Road), constructed upon a new principle, which gives a very largely increased light for the present consumption of gas. The North London Railway have already one train fitted with these lamps, and the company hope to commence fitting their carriages with them in the course of this month.

A SERIES of descriptive geometry models for the use of students in schools and colleges has been designed and brought out by Mr. Thomas Jones, gold medallist, member of the Institution of Mechanical Engineers, of 27 Barton Street, Moss Side, Manchester. They are a wonderful production, at the low price of 1s. 3d., and will serve for many purposes as well as more expensive solid models.

PLANS have been prepared for an extension of the Rubery Hill Asylum, which will cost 25,000*l.* The asylum is controlled by the Birmingham City Council.

THE tender of Messrs. Morrison & Mason, Limited, to construct the Blackrigg section of the new aqueduct from Loch Katrine to Glasgow for 86,700*l.*, has been accepted by the Glasgow Corporation. The highest tender was £99,000, and there were one or two offers lower than the accepted one.

WE are informed that plans for the superstructure of the Liverpool Post Office in Victoria Street will not be ready for another month, when tenders will be invited. About six months may elapse before the acceptance of a tender is notified.

AN inquiry has been held at Holyhead into the application of the Anglesey County Council for sanction to borrow 3,000*l.* for the erection of a new police station at Holyhead.

THE Port Glasgow Town Council have accepted the offers from the various branches of trade in connection with the proposed baths and washhouses, for which Mr. Joseph Russell, shipbuilder, gave 5,000*l.*, viz:—Mason and brickwork, Mr. William Steel, Greenock; carpenter and joinerwork, Mr. William Fyfe; slaterwork, Mr. Ninian J. Gillespie; plumberwork, Messrs. Wm. Wilson & Sons; gas-fittings, Messrs. Brownlee & Co., all of Port Glasgow; iron piping and washing and drying apparatus, Messrs. Murdoch & Cameron, Glasgow;

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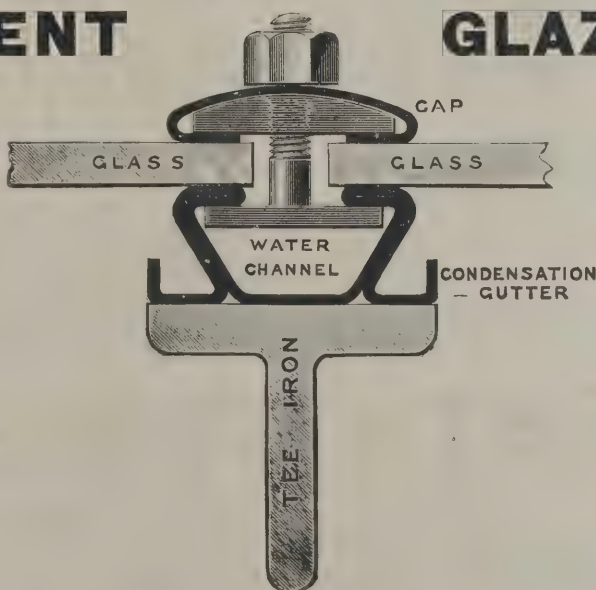
CLOCKS AT	BELLS AT
Manchester Town Hall	Craig-y-Nos Castle
Exeter Cathedral	(Mad. Patti)
Llandaff "	Eddystone Lighthouse
Wells "	Birmingham Municipal
Sligo "	Buildings
Bradford Town Hall	Hove Town Hall
St. James's Palace	Burnley, Holy Trinity
London	Church
Sherborne Abbey	Crawley Parish Church
Sydney Town Hall,	Corbridge-on Tyne
N.S.W.	Parish Church
Durban Town Hall, S.A.	Widmore Church
Royal Military Exhibition, &c., &c., &c.	Eiffel Tower, Paris
GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1885.	
SILVER MEDAL—PARIS 1889.	

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ironwork, Messrs. P. & W. McLellan, Glasgow; painterwork, Messrs. Macfarlane & Co., Glasgow. The architect is Mr. J. B. Stewart, Greenock. The cost will be about 4,000l.

AUTOMATIC AND MECHANICAL VENTILATION AND SANITATION.

ONE of the most original systems for the efficient ventilation of private and public buildings, &c., is that of Messrs. Baird, Thompson & Co.'s latest improved patent combined system of automatic and mechanical ventilation and warming. This new invention has the merit of diffusing pure fresh air through the largest buildings, accompanied by complete ventilation, and is free from dust and effluvia or other offensive properties. This system from one source and centre is capable of easy regulation and of producing the same or different degrees of temperature in various compartments of the same building. These are advantages of the first importance in churches, schools, public halls, mansions, &c., and the Baird-Thompson system insures purity of air as well as efficiency and economy. This new system has already made a reputation, but its merits both of comfort and economy cannot be too widely known. This system of ventilation is adapted to hospitals, churches, schools, public works, mines, ships, sewers, &c. An important feature in this firm's system is that it can be adapted to existing buildings as well as new ones without any great trouble or expense.

ELECTRICAL.

AFTER protracted investigation the Lighting Department of the Bolton Corporation have decided upon a scheme of electric lighting and to secure power to borrow 40,000l. to carry out the undertaking.

THE arch roof of the chamber leading to the electric light station in the north terrace at Windsor Castle has been opened preparatory to some alterations which are about to be made in the machinery of the palace installation.

AT the last meeting of the Edinburgh Literary Institute Mr. E. A. Browning gave a lecture on "Electric Light in our Homes." After a reference to other methods of illumination, such as oil and gas, he said that a perfect light should not consume the oxygen in the room, it should not add noxious

fumes to the air, it should not be a source of danger in the house, it should not be an unpleasant light, it should not be difficult to control, and it should not be too costly. These conditions were, he demonstrated, all fulfilled by the electric light. In London it cost about three times the price of gas, in Newcastle-upon-Tyne about one-third more, and in Dundee about one-half more. But this additional cost was returned to the consumer, as there were no blackened ceilings or wall-papers soiled, and better health followed its use.

AN inquiry has been held by the Local Government Board at Blackpool concerning the application of the Corporation to borrow 26,000l. for the purposes of electric lighting in the borough. A further application to borrow 9,590l. for the store yard and 1,500l. for sewage works was also gone into.

ELECTRIC LIGHTING.

IN his presidential address to the Institution of Electrical Engineers, Mr. W. H. Preece said that the rapid development of electric lighting had been seriously retarded in England by the operations of a monster called into existence by the limited liability legislation of recent years, the rapacious financial promoter, whose plunder in one year of our period far exceeded in amount the sum of all the thefts of all the highwaymen and burglars that were ever hanged. He had ruined the prospects of private enterprise and had rendered absolutely necessary the Acts of 1882-88, which had thrown the industry into the hands of the local authorities of our cities and boroughs. The glow-lamp had been greatly improved, and as this year would witness the expiry of the controlling master patent, we should see the price reduced to something not far from 1s. Some could remember the time when the price was 25s. It had now for some time been 3s. 9d. As a glow-lamp cost only 9d. to make it might reasonably be hoped that his anticipation would be realised. The cost of wiring was a great deterrent to the introduction of the electric light into small tenements and into houses held on short tenures. The materials used must be of the most perfect kind, otherwise insecurity was incurred; but there were expensive practices of wood-casing and of ornamentation which wanted reform. The Cheap Jack was the curse of the industry, and the absence of specification and of inspection the danger of the user. The fire-insurance offices had maintained our practice in England pretty secure, but in other countries the character of the work had been very indifferent, and even horrible. The

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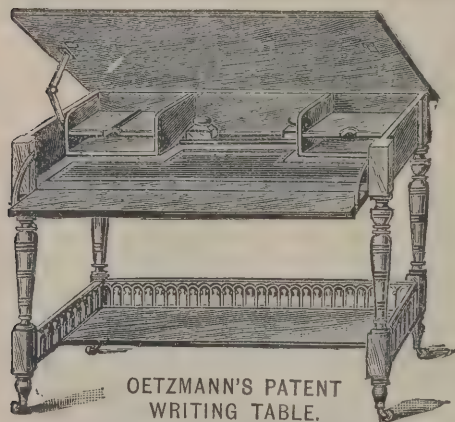
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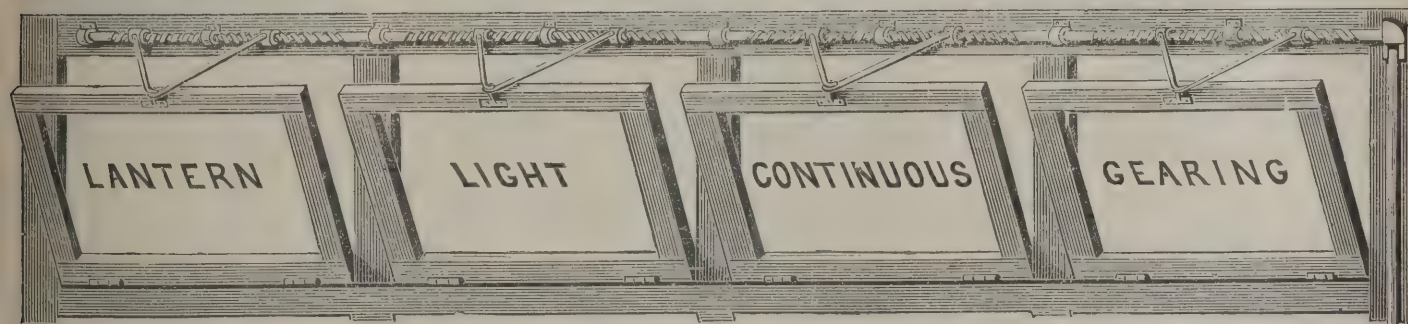
problem of economic distribution had been much simplified by the introduction of the three-wire system by Dr. John Hopkinson, and by the improvements made in high-pressure apparatus. High-pressure not only economised the heavy cost of mains, but simplified immensely the mode of regulation. The early pioneer alternate-current systems, which had done so much to further the development of electric lighting, were, however, costly in their coal bills, owing to great losses of energy in their iron and copper, but the transformer of the present day was as perfect in efficiency as the dynamo. These losses had practically disappeared, and modes of switching transformers in and out at will had removed every difference of cost between high-pressure and low-pressure systems. The prejudice against high-pressure was still strong, but time and experience would eradicate it, as they ultimately eradicate every fallacy. The progress in electric lighting was now principally economical. The cost of production of electrical energy was rapidly coming down. Elements of waste were being eliminated, and continuous working throughout the day and night was being encouraged. If a full load could be maintained during the whole twenty-four hours, electrical energy could be manufactured for one-third of a penny per supply unit, and this was equivalent to gas at 2d. per 1,000 cubic feet. The potentiality of economy in electric lighting was thus beyond the dreams of the gasman. The most marked features in the development of this great industry were the ostrich-like blindness of the gas-manager, who buried his foresight in his fat dividend, and the childish wailing of their technical journalists. The gas industry should itself have nursed this herculean infant, who was rapidly strangling one of its main sources of profit. Fortunately for the gas shareholder, there were other sources of income—warming, cooking, motive power—to be developed. Our corporations and local authorities were showing more astuteness. Manchester, Nottingham, Dewsbury, though successful gas producers, had assumed also the position of undertakers of electrical energy. Electric lighting, carried out under the provisions of the Acts of 1882 and 1888, was a self-supporting, self-managed and profitable industry. It was a business of a mutually co-operative character, carried on by the ratepayers themselves for their own sole benefit. Nothing would stop the growth or prevent the rapid spread of this beneficent and sanitary mode of illumination into the confined, ill-ventilated, overcrowded homes of the work population. The electric light was essentially the poor man's lamp. Many efforts were being made to utilise the waste

forces of nature in producing electric currents for the economical supply of the light. In America, Scotland, Switzerland, Italy and, indeed, wherever waterfalls were available, electric plant was being installed to convert the energy of the fall into the useful form of electricity. There was much water-power in this country that might be used. There were many towns whose public streets could be brilliantly illuminated by the streams running past them; but there was much fear and distrust to be removed from the minds of our local magnates, and a considerable amount of education was necessary before the public would receive the full value of the gifts that nature so freely placed at its disposal, and the engineer so thoroughly converted into a utilitarian form.

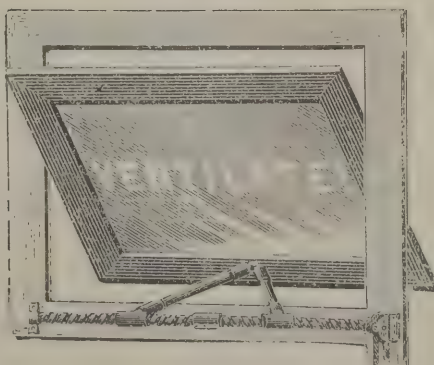
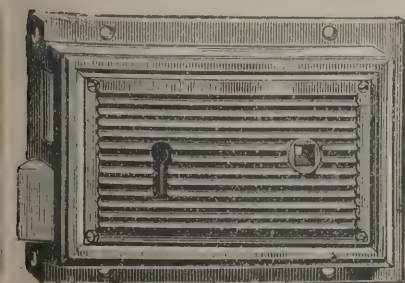
NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

THIS Association held its thirtieth half-yearly meeting at the Midland Hotel, Derby, on January 24. Mr. J. C. White, the president, presided, and representatives were present from London, Liverpool, Manchester, Birmingham, Nottingham, Leeds, Bradford, Northampton, Hull, Shrewsbury, Bath, Leicester, Derby, The Potteries, Walsall, Huddersfield, Preston and Portsmouth. The chairman reported that during the past half-year there has been a special meeting of the Council, held at Birmingham, by request, to discuss the strike at Cardiff, at which were present representatives from Manchester, Liverpool, Cardiff, Birmingham, Bristol, Kidderminster, Leigh, Ipswich, Walsall, Bath, and Portsmouth, and an unanimous resolution, recording their appreciation of the firm stand the Cardiff master builders were making in the protracted strike at Cardiff was passed by the Council, and the Association pledged to assist them by every legitimate means. That the Council have nothing definite further, at present, to report on the question of the long-debated form of conditions contract, except that a general agreement has at last been arrived at between the Royal Institute of Architects and the Institute of Builders, subject to the opinions of the legal advisers of the respective institutions on the legal bearing of the clauses, and the draft is now in the hands of those gentlemen to settle between them the wording of the clauses in any case in which they may contravene the law. That the Council will, during the approaching session of Parliament, keep a close watch upon

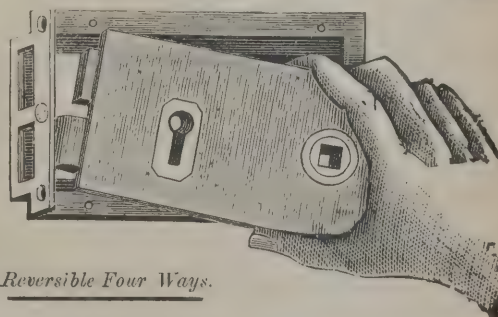
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any action that may be taken by the Government, or by private members, in bringing forward Bills which may in any way affect the various interests of the building trades, or the relations between employers and employed.

The Chairman also reported that he had received a communication from the Federated Builders' Association of Australia, which was formed for the protection of the trade, upon lines very similar to the National Association, as they had agreed conditions of contract with the Australian architects, guaranteed quantities, and, under the Employers' Liability laws, they had a builders' insurance, the premium of which was 7s. 6d. per cent. They were also giving their attention to the eight hours question, the apprentice question and to technical instruction.

The report and accounts were read and adopted.

Mr. Robert Dennett (Messrs. Dennett & Ingle), of Nottingham and London, was elected president in place of Mr. J. C. White, of Liverpool, who retired, and Mr. Dennett thereupon delivered his inaugural address, which is given in another column.

Mr. John Bowen, Birmingham, and Mr. T. F. Rider, London, were elected vice-presidents, and Mr. J. C. White, Liverpool, was elected one of the hon. vice-presidents for the ensuing year.

Mr. Jos. Stevenson Jones, Liverpool, was re-elected hon. treasurer and Mr. C. W. Green was re-elected hon. auditor, and the following gentlemen were elected members of the Council:—C. H. Barnsley and W. Sapcote, Birmingham; Joseph Henry Marsden, Bolton; William Moulson and W. Holdsworth, Bradford; A. Krauss, Bristol; Joseph Bell, Cambridge; John Walker, Derby; Thomas Bonnar, Edinburgh; R. Bennett, Glasgow; R. Beevers, Hull; C. Myers and Banks Mawson, Leeds; William Henry Close, Lincoln; J. B. Johnson and Hy. E. Dallow, Liverpool; Frank May and John Burt, London; William Southern and Alderman Wm. Brown, Manchester; W. H. Smith, Northampton; Enoch Hind, Nottingham; James Bowden, Potteries and Newcastle; John Walmsley, Preston; Chas. B. Holmes, Wigan.

A vote of thanks was accorded to Mr. J. C. White for his services as president, to which Mr. White responded. A vote of thanks was also unanimously accorded to Mr. Stanley G. Bird for the evidence given before the Royal Commission on Labour.

It was decided to hold the next half-yearly meeting at Huddersfield.

TREVITHICK'S THAMES TUNNEL.

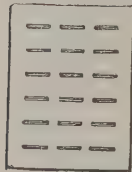
RALPH DODD, an engineer of some note of the last century, was the first to commence operations for a tunnel under the Thames from Gravesend to Tilbury Fort. His plan was to avail himself of the chalk stratum which he supposed to run under the bed of the river, and he expected that the chalk quarried out would sufficiently pay the expenses of working, leaving its subsequent use as a viaduct to afford a handsome income. He obtained an Act of Parliament for his plan in 1799, with power to raise 30,000*l.*, and to increase his capital in case of need to 50,000*l.*, his estimate being only 15,000*l.* The work was commenced and proceeded for about three years, but was ultimately stopped on account of the expense of drainage. He had gone on the assumption that the chalk would be in one solid stratum, and that he should not be embarrassed by water, having in his estimates allowed only 1,780*l.* for this purpose, and treated the expense as merely contingent. He found, however, such great inconvenience from under-springs rising through fissures in the chalk, that he was obliged to abandon the project. This tended to throw a damp on such plans, and when Trevithick proposed a similar tunnel under the Thames at Rotherhithe, he found a natural reluctance to support any such undertaking. Several of his friends, however, raised a subscription to enable him to make an experiment on a small scale, and the result was anxiously awaited to justify an appeal to the public for carrying out the entire plan. In 1809, therefore, Trevithick was employed in running a small driftway parallel to the bed of the Thames. The committee of subscribers justly felt every assurance of the success of the undertaking, for the operation was extremely simple, while they had entire confidence in his skill and ability, from the experience he had gained in similar underground mining works. Trevithick, to save labour and expense, committed the usual fundamental error of not going deep enough below the bed of the river, the object in his case being a close-run endeavour to keep at the least possible distance from it. Had his experiment been concluded, this would have enabled him to give a plausible original estimate at any hazard of subsequent increased expense. This error, however, was not productive of much inconvenience to him, nor was it the immediate cause of the abandonment of the enterprise, for he carried his driftway to a greater extent without impediment than has been done in any other attempt. It was not until he had gone 930 feet under the river that he



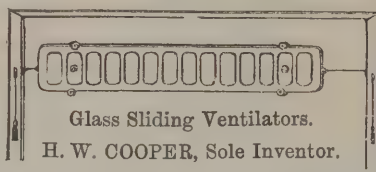
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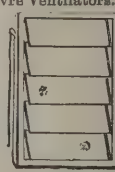


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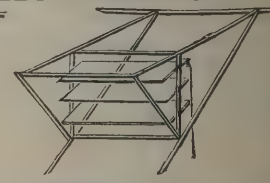
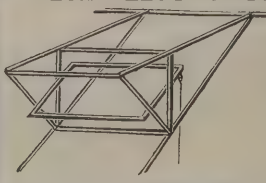
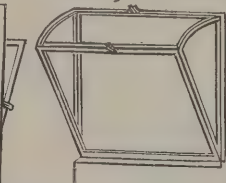
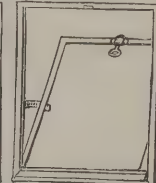
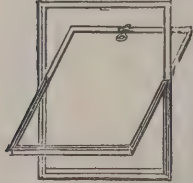
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encountered any obstacle, when he got into a hole in the muddy bottom of the river, and at one time a piece of uncooked ship beef, which had fallen from one of the vessels, drifted into the works. Although the Corporation authorities refused to allow him any facilities, he managed to get this hole stopped, and again went on with vigour. He carried on the excavation at the rate of from 4 to 10 feet per day, and soon completed 1,000 feet, to the great joy of every one concerned. On arriving at this distance, according to his previous agreement with the committee, Trevithick was to receive a hundred guineas, which, after a verification of the work by a surveyor, were paid to him. This surveyor was appointed by the subscribers to check Trevithick, and in giving in his report confirming the measurement, stated that the line had been run 1 foot out of the perpendicular. This statement Trevithick took in high dudgeon, and chose to consider it as a deep reflection on his engineering skill to have deviated 1 foot in a thousand. With his usual impetuosity he set to work to disprove the assertion, without any regard to consulting his own interest, or embroiling himself with the committee. Of all possible contrivances for effecting this object he adopted the most absurd, which was no less than to make a hole in the roof of the tunnel at low water, and to push through a series of jointed rods to be received by a party in a boat, and then observed from the shore. Even had he been successful in carrying out this process, it would have afforded no criterion of the precision of the work, as the set of the current would necessarily have swerved the rod. Trevithick was employed in the driftway in carrying out this contrivance, and as delays of course ensued in fitting together the rods, the gully consequent on the opening in the roof ultimately admitted so much water as to render a retreat necessary. With a moral courage innate to his character, and worthy of a better cause, he sent the men on before him, and very nearly fell a sacrifice to his devotion. It has been already observed that the driftway was parallel to the bed of the river, and consequently curved. It necessarily happened, therefore, that the entering water would lodge, syphon-like, in the bottom of the curve, at which part, on Trevithick's arrival, he found so much water as hardly to be able to escape, for as he ascended the slope on the other side and climbed the ladders the water rose to his neck. It is needless to say that this act of rashness was the death-blow to the project, while it added the climax to the many acts of inconsistency with which Trevithick's erratic career was disturbed. On a subsequent occasion, being cross-examined as to this occurrence while

witness on a trial, he admitted the fact of his ruining the works, and his determination in any similar circumstance to defend his own character at whatever sacrifice to other people. The work thus ended after having reached 1,011 feet, and remains within 100 feet of its proposed terminus, a melancholy monument at once of his folly and his skill.

THE MINCING LANE SAFE DEPOSIT.

A GREAT transformation is being slowly but surely effected at the London Commercial Sale Rooms in Mincing Lane, under the auspices of Mr. P'Anson, architect, whose plans are being efficiently carried out by the contractor, Mr. J. T. Chappell.

One important feature, however, has already been realised in the provision of an adequate and handsomely equipped Safe Deposit, constructed by Milner's Safe Company, which is on the point of being opened for the use of the public, who will find an absolutely secure but inexpensive depository for documents and valuables of every description in safes of varying size, immovably fixed in steel-clad and burglar-proof as well as fireproof vaults.

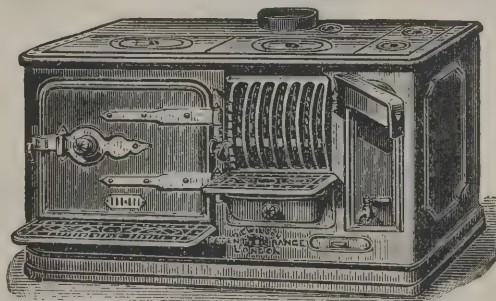
The descent to the vaults is easily accomplished, and we find ourselves in the manager's office, which is contiguous to the spacious and commodious waiting-room set apart for the use of clients, where they can transact their business with comfort. Passing through an iron grille, entrance is afforded to the actual safe deposit, consisting of a huge steel fortress divided into four capacious apartments, the whole being self-contained and impregnable, while there is a space left between the safes and the walls of the vault, to enable the armed patrol to walk round the treasures committed to their custody. Three of the compartments are fitted up with safes, numbering in all no less than 1848, which vary in size from 4½ inches to 14 inches high, with a width of from 7½ inches to 11½ inches, and an uniform depth of 20 inches, the charge being from one guinea to three guineas per annum each. The remaining compartment is adapted as a strong-room for the reception of plate or other bulky valuables. All the four doors are controlled by lever locks of a special construction, which are also fitted with chronometer movements, so that when the locking has been effected and the chronometer set for a given number of hours, the mechanism

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acts in such a way that access cannot possibly be obtained until the regulated time has elapsed. The renter of an integer or small safe is furnished with a key, which however of itself does not afford the "Open sesame"; to accomplish this another key in conjunction is requisite, which is known as the "cover," and is always kept in the manager's custody. Eventually and in due time the entire place will be lighted by electricity, while there is an admirable and effective system of ventilation being carried out, for which credit must be awarded to the well-known firm of Messrs. Rosser & Russell.

The decoration of the Safe Deposit, it may be added, is of a superior character, while the accommodation afforded is beyond the ordinary, and the *habitués* of Mincing Lane, together with many others, will doubtless appreciate the latest enterprise of the well-known firm, Milner's Safe Company.

SKY-SIGNS IN LONDON.

ON account of the efforts which have been made to defeat the purposes of the Sky-Signs Act of 1891, the London County Council have inserted a clause in their General Powers Bill of this session in order to repeal the meaning of a "sky sign" as defined in that Act. In the place of that definition, which was directed against the familiar iron structures over the roofs of buildings, the Council propose a more comprehensive definition and the extension of the powers of that Act to any "sky-sign" which shall fall within it. The proposed new definition of "sky-sign" includes "any word, letter, model, sign, device or representation in the nature of an advertisement, announcement or direction supported on or attached to any post, pole, standard, framework or other support, wholly or in part on, over or against any house, building, structure or erection of any kind, including all and every part of any such post, pole, standard, framework or other support." The expression "sky-sign" also includes "any balloon, parachute or other similar device employed wholly or in part for the purpose of any advertisement or announcement on, over or against any house, building, structure or erection of any kind, or on or over any street or public way." The expression will also embrace "any flagstaff, pole, vane or weather-cock, if adapted (but not otherwise) for the purposes of any advertisement or announcement." It will not, however, include "any sign on any board securely fixed to or on the top of a wall or parapet of any building, or to the ridge of a roof, provided that the board or other contriv-

ance be of one continuous face and not open work, and do not extend in height more than 3 feet above any part of the wall or parapet on which it is fixed."

REGISTRATION OF PLUMBERS.

A DEPUTATION, introduced by Mr. W. Watkins, F.R.I.B.A., ex-Mayor of Lincoln, accompanied by Mr. G. J. Dashper, Clerk of the Peace, and Mr. R. A. McBair, City Surveyor, composed of about thirty master and operative plumbers from Lincoln, Grantham and Lincolnshire, recently visited London to inspect the Museum of Sanitary Appliances, and Testing Department in connection therewith, established by the Hornsey Local Board at Highgate. Among the registered master plumbers on the deputation were Messrs. Bocock, Coupland, E. F. Arnold, Boole, &c. The deputation afterwards waited on the Lord Mayor at the Mansion House.

The Lord Mayor, in welcoming them, said he was pleased to learn that the Corporation of Lincoln were doing their utmost to promote sanitary science. He was always happy to welcome to the Mansion House the representatives of bodies interested in sanitary work, especially those coming from a distance, as in the present instance. He was very pleased to see the deputation headed by their ex-Mayor, Mr. Watkins, who was well known in connection with matters concerning domestic sanitation. Referring to the visit of the deputation earlier in the day to the Highgate Museum and Testing Department, which he had the pleasure of opening a short time ago, he said it was undoubtedly a step in the right direction for a public body like the Hornsey Local Board to found, as it were, a museum for the technical study of plumbing work, and the presence of that deputation from Lincolnshire was an evidence that the intelligent and public-spirited action of the Board was already bearing fruit. The Corporation of the City of London prided itself on taking a leading part in all matters concerning the health, not only of the citizens of London and the suburbs, but of the community at large. After enumerating some of the public works carried out by the Corporation outside the City, the Lord Mayor referred to the important public work which the Plumbers' Company were doing in extending the national system for the training, examination and registration of plumbers throughout the whole of Great Britain and Ireland.

Mr. W. Watkins, on behalf of the deputation, thanked the Lord Mayor for the very kind manner in which he

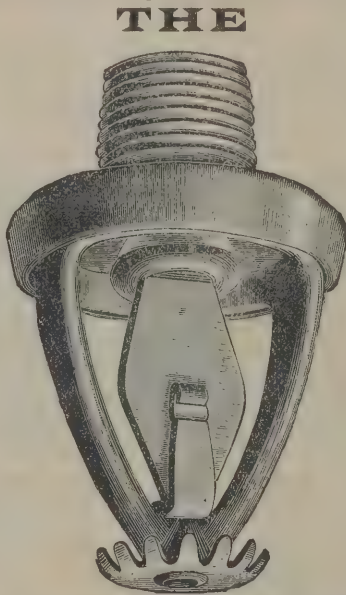
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had received them. He said the deputation was composed principally of master and operative plumbers, the other members of it being architects and surveyors, who took a keen interest in the plumbers' registration movement and in all matters connected with plumbers' work. He was only expressing the sentiments of the whole deputation in saying that they felt amply repaid for their visit to the Highgate Museum, which was of a thoroughly practical character and should be visited by all persons in any way concerned in sanitary work. Referring to the spread of the plumbers' registration movement in the provinces, he said that, as an architect, he felt that the Plumbers' Company could not possibly better promote the interests of the public health than by carrying on that movement in the way they were doing.

The members of the deputation, after partaking of some light refreshment, were shown over the Mansion House.

LIST OF REGISTERED PLUMBERS.

London Journeymen.

GLOVER, M., 93 Amity Road, West Ham, E.
MITCHELL, T., 34 Munster Square, Euston Road, N.W.
NICOL, C., 7 Emily Terrace, Coopers Arms Lane, Putney, S.W.
RUSSELL, J., 187 Victoria Street, Westminster, S.W.

Provincial Masters.

BYWATER, R., Eastgate, Louth, Lincs.
CURTIS, T., Market Place, Gainsborough.
DIX, H., St. John's Wood Road, East Cliffe, Bournemouth.
GREEN, J. H., 8 Portland Street, Lincoln.
WARD, H., 90 Coburg Street, Leith, N.B.
WHEELER, G. C., 63 Union Street, Ryde, Isle of Wight.

Provincial Journeymen.

BAKER, J., 8 Copper Hill Terrace, Hamble, Hants.
BAMBER, R. D., West Street, Alford, Lincs.
CLARK, D. M., Beula Cottage, Rosetta Road, Peebles, N.B.
CROMAR, W., 30 Allan Street, Aberdeen.
HAWKES, J., South View, Farnham, Surrey.
HEPBURN, W. G., High Street, Coldstream, N.B.
JONES, H., 10 Frederick Street, Portsea.
MALCOLM, R., 21 Charles Street, Aberdeen.
MORLEY, B. J., 15 Connaught Street, Northampton.
SHIP, F. H., 5 Pleasant Place, Sheet Street, Windsor.

NEW CATALOGUES.

A MONSTER catalogue has been issued by the Ruabon Brick and Tile Company, Limited, containing 100 plates illustrating their specialties. The catalogue has been prepared to meet a requirement believed to exist in the offices of architects and others, and the compilers claim that it is the largest and most comprehensive work of the kind yet published. The aim in view has been to design artistic patterns applicable to modern construction and modern tastes. The company are indebted to a well-known architect, Mr. Alfred Burr, F.R.I.B.A., for his assistance in the preparation of the catalogue. Moulded bricks of all kinds and for all purposes are illustrated, and other ornamental bricks, dentils, bands, jambs, stops, key-blocks, diapers, squares, panelling, diagonals, &c. There are also shown swags and panels, cornices, balusters and balustrading, arches, lintels, architraves, sills, quoins, &c., &c., and every variety of ornamental feature connected with architectural construction.

FUNCTIONS OF THE BUILDER.*

THERE are apparently changes impending which may modify, if they do not transform, the office of the builder. On all sides we find people who are eager to introduce new arrangements. The system by which Great Britain is covered with buildings that are sound, commodious and economical is, in the opinion of amateurs, out of joint, and wants mending. Hence it is we find good-natured people are eager to benefit the world by substituting for our experience the undisciplined boldness of outsiders.

This spirit reveals itself not only in the dreams of imaginative gentlemen who would desire to see the architect leading a body of craftsmen, while in some way he shares in their toil. It is seen, too, in the desire to have architects whose diplomas are evidence that they have mastered all the mysteries of construction, and are able to take our places. It inspires also the proposals of public bodies to dispense with builders. It gives point to the articles which the journals print whenever an

* From the inaugural address at the meeting of the National Association of Master Builders of Great Britain, by Mr. Robert Dennett, president.

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accident occurs. The support which is given to strikes depends on the belief that we are in some way in the wrong. It is a curious fact, as exemplifying this tendency of the present, that the member who was charged with the introduction of the last Registration Bill in Parliament imagined it was intended to apply to builders as well as to architects.

It is not in England alone that there is a wish to disturb arrangements which exist, because they are found to be in correspondence with the needs of the public. I have been told that a few weeks ago in Paris the Chief Administrator of the Department of Public Works declared in public that it was a wrong to have a division between architects, engineers, contractors and workmen, and that all their duties could well be fulfilled by one individual. In England we often hear similar propositions about rolling four single gentlemen into one, but in France the State out of the taxes creates both architects and engineers. Such amalgamation as was suggested on that occasion is equivalent to saying that the Government have been acting wrongly, and that the public funds are misapplied. Yet such is the courage of the advocates of change, they will incur any sort of risk if it helps to advance their hobby.

I am not concerned with a defence of the French system of executing works. But I would ask, what evidence is there that English builders are not performing their work most satisfactorily? In spite of the extraordinary variations of our climate how many buildings are cast down? Even among the defects of jerry-building want of stability is not included. Indeed some artists lament the enduring powers of that class of structure. I am not disposed to maintain that builders are not fallible like the rest of humanity, but I do say that there is no business in the country which, taken as a whole, is conducted more honestly than our own. Nor should it be forgotten that in many cases the temptations to the contrary are very strong.

The proposal to erect dwellings and buildings in London by the County Council without the intervention of a contractor may be taken as an illustration of the lengths to which reformers or rather theorists are prepared to go. In an experiment of that kind everything works smoothly, for there is no risk. The defects in foundations or other natural obstacles need excite no alarm, for the cost of dealing with them is provided for. It will not be necessary to be alarmed about extra works or grieve over the deduction of items which were expected to be profitable. There is no anxiety about the chance of loss or any other contingency of the kind. The men employed will be always in good humour, and those who supply

materials will always be in the most accommodating mood. Building in fairyland could hardly be more of a pastime than it will be under the County Council in London. But can you imagine, gentlemen, that so happy-go-lucky a method can be economical? We who have to suffer mental distress every day on account of the responsibility which we have assumed and who occasionally have to bring all our courage to bear, in order to face our risks, know too well what the consequence will be. No doubt a very pleasant sight will be afforded when we find all who co-operate in a building working harmoniously together, but like all spectacles which are novel it will be found that money must be liberally expended on the arrangements. It will be said by the advocates of similar schemes that on private works in many places the builder has been already superseded. Drapers, co-operative stores and providers of miscellaneous things are credited with having carried out important works very successfully at a fraction of the legitimate charges. All those cases have never been properly scrutinised. If, for example, a co-operative store is able to furnish gasfittings at one-fifth the price which experts had estimated, is it not plain that the profit and loss account of the gas-lighting department of the store was never properly made out? In all such cases a great number of departments have to be taken together, and the loss in one of them is compensated by the gain in another. Then, again, when we hear that a draper has offered to do certain works in stone or iron far below cost price, we may always expect to find that he is to be allowed to supply goods that are within his province. For what he loses in construction he is able to refund himself by what he gains in furnishing. It would be easy to explain many other inconsistencies, but I need not waste your time about them. The public may rest assured that in building works, no matter what agency they may employ they will not gain more than if they had trusted themselves to a respectable and established builder.

We have no opportunities of performing such tricks of legerdemain. If by any oversight we under-estimate the cost of work we have to bear the penalty. We have no means of finding compensation. We have no prospect of receiving payment for work which was not executed. In fact, I consider that if the advocates of revolutionary changes were aware of the liabilities of builders to incur loss, they would be somewhat less bold in bringing forward their schemes.

They are to be excused, however, for workmen who sometimes have been closely connected with us for many years appear to have a notion that all contracts are profitable. In no



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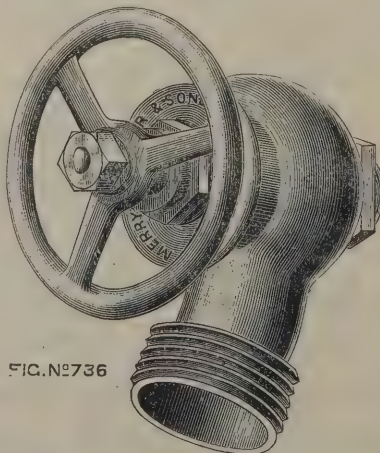


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other way can I explain the tendency to strikes which has prevailed of late. Any cause seems to be sufficient to stop works. I will give the English workman the credit of being very honest. If he had not assured himself that there was more than sufficient profit in every case to meet his demand, he would hesitate before he created so much confusion. Of late years his demands have taken two forms, an increase of wages and a reduction of working hours. To discuss on what principles wages should be determined would take me too far on the present occasion. It is a vast subject, and one which has many sides. But I think I may say that the workmen of any district (Cardiff among others) would find in our association as reasonable advisers in their difficulties as they could select. The Council of the Association are bound to take a broad view of the organisation of which workmen form an important part, and they are not likely to undervalue anything which would cause business to be stopped for a day if in an honourable way they could devise a remedy. I am sure that I am only expressing your minds when I say we have all the fullest sympathy with our workmen. This is seen by the endeavours which are made to keep them with us. We are all proud of having workmen who have continued with us since their apprenticeship, and I have no hesitation in saying, incredulous as it may appear to sceptics, that one of the causes which lead so many of us into unprofitable contracts is the desire to retain an unbroken staff around us.

As regards working-hours the question must be judged from another point of view. No doubt, gentlemen, your experience has been the same as my own, which is that in no department of life, outside the Government service, a man has not been able to advance himself who has been satisfied with working eight hours a day. All professional men must undergo greater toil unless they wish to remain at a low level. I am afraid our own business would hardly be profitable any day if we were satisfied with giving only eight hours' attention to it. I see no reason, in spite of all my regard for the working-classes, why they should have a much easier life than our own. As a rule, they have not only to work fewer hours, but they are free from responsibilities and other harassing sorts of wear and tear, which we must endure.

Some of you may remember in your youth to have seen statements or tables which were prepared by Peter Nicholson, who once upon a time was accepted as an authority. He called them "Constants of Labour," and they were intended to show how much time was to be occupied with the most insignificant

details of builders' work. I have never used Nicholson's "Constants," nor met a builder who employed them in preparing a tender. But I have no hesitation in saying that the time which he assumed as a basis for his calculations would not correspond with what is now required. For all kinds of handwork more hours are indispensable than formerly. If the "Constants" were now in use they would have to be altered every year.

Now this is a subject which does not concern us alone. The builder is in reality no more than an agent for the public, and whatever affects him must operate also on those who employed him. Strange to say this undoubted fact is not realised. The public would seem to be indifferent when there are contests between workmen and builders. They appear to consider that the disagreeable affair is entirely circumscribed to the parties who encounter one another. They do not see that what builders are contending for is the public interest. For instance, is there a member among all those I have the privilege of addressing who can recall one case where he was told that he might proceed with deliberation in the erection of a building? The rule, as we all know, is to insist on the utmost expedition. We are bound under penalties not to go beyond a determined day.

Now, if buildings have to be erected as hitherto, *i.e.* without loss of time, is it not plain that with shorter hours and a diminution of the quantity of work produced in each of those hours, it will be necessary to employ far more hands, for which building owners will have to pay? By all means let the public become philanthropists. We are quite willing to keep works open for only a few hours every day, and to employ such a number of men that labour will need no exertion. But in that case they must not grumble at the amount of our tenders, nor go about bemoaning the degeneration of builders.

There are perhaps very few of the public who are not more or less responsible for the condition of affairs which is supposed to make a reform of the building trade a necessity. They may not argue like the French official, the representative of the Minister of Public Works, to whom I referred at the beginning. He would lead the public to imagine that it is possible for a workman, under a proper system of administration, to change places with an architect, engineer, or contractor. But by tolerating experiments like those of the London County Council, by encouraging dealers in cottons and soft goods, pins and needles, to go in for masonry, ironwork and sanitation, and by their unconcern during strikes and trade disputes they are helping to make workmen discontented. For my part, I

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believe that the worst sort of grievances to endure are, those which are vague, and I am sure building-workmen at the present time would suffer less if they defined what they want, and endeavoured to discover how it could be realised.

As regards our trade, I suppose there never was a time when there were better facilities and more competence for executing work than there are at present. I am an advocate of the promotion of technical education, but I must say that I still believe the best school for young builders is to be found in builders' workshops. No branch among all the industries of England has been put to severer tests than ours. Styles of architecture change, and whatever is in fashion we are able to realise it with all the spirit of our ancient predecessors; Greek, Gothic, Roman or Dutch buildings are alike to us. New requirements demand novel arrangements of construction, which are carried out as if they were an everyday affair with us. In that way the history of any great building works becomes a sort of key to the industrialism as well as the taste of the age.

The public may not be able to appreciate all that we do at a right value. They cannot tell how much it costs to organise a system which will answer promptly and accurately every sort of demand that can be made upon it. But it is evident that at least one school of architects is able to realise how an ordinary builder's workshop can become an auxiliary to the architect's office or the school of art. Some of you, gentlemen, may have seen the remarkable collection of essays entitled "Architecture: a Profession or an Art?" In the pages we find many things which reveal an altered recognition of the builder's importance. Thus it is stated, "The contractor, the purveyor of labour, is not so far removed from actual building work as we architects, for he has, at all events, to know the nature and quality of materials, and he has generally passed through the workshop and learnt one or more trades and made himself a handicraftsman. It would be an excellent thing if every one who aspired to be an architect did the same, and learnt to do work with his hands as well as with his head." The example of the late Sir Gilbert Scott (a name that can never be mentioned by a builder, and especially myself, without reverence) might be cited as suggesting the value of some experience in a builder's workshop. When he had completed his articles in a London architect's office, he went direct to the offices of Messrs. Peto & Grisswell, to whom he gave his services in return for having the run of their workshop and their London works. There he acquired that practical knowledge which was of such advantage to him during a career which was marked by masterpieces.

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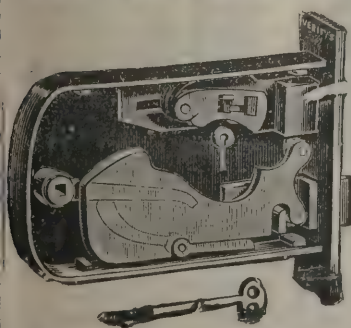
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DOWLAIS.—For Part Rebuilding Parish Church. Mr. E. A. Johnson, Architect, Abergavenny.

DUNDALK.—Feb. 13.—For Construction of Sewers. Mr. J. Gaskin, Surveyor, Town Hall, Dundalk.

EAST THURROCK.—Feb. 15.—For Building Hospital Pavilions, and for Additions, &c., to Workhouse at Orsett. Mr. Charles Pertwee, Architect, Chelmsford.

ELLON.—Feb. 15.—For Construction of Bridge at Kin-harrachie. Mr. W. Davidson, District Surveyor, Ellon.

FINSBURY PARK.—Feb. 21.—For Building Chrysanthemum House. The Architect to the County Council, Spring Gardens, S.W.

FLEETWOOD.—Feb. 20.—For Alterations to Free Library. Mr. T. Whitaker, Architect, Poulton Road, Fleetwood.

FULHAM.—Feb. 15.—For Making-up and Paving Roads. Mr. W. Sykes, Town Hall, Walham Green.

GLASGOW.—Feb. 13.—For Building Stables, Cartsheds, &c., Dalmarnock, for the Tramways Committee. Mr. John Young, General Manager, 64 Cochrane Street, Glasgow.

GREENWICH.—Feb. 15.—For Supplying Broken Granite, Ragstone, Flints, Gravel and Thames Ballast. Mr. J. Spencer, Board of Works Offices, Greenwich.

HACKNEY.—Feb. 14.—For Construction and Maintenance for Twelve Months of Brick Barrel Sewer. Engineer's Department, County Hall, Spring Gardens, S.W.

HOMERTON.—Feb. 22.—For Alterations to Mortuary and Works at Eastern Fever Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

HUDDERSFIELD.—Feb. 23.—For Building Vagrant Wards, Sergeant's House, Boundary Walls, &c. Messrs. John Kirk & Sons, Architects, Huddersfield.

KENDAL.—Feb. 14.—For Building First Two Blocks of Twelve Dwelling-houses. Mr. John Hutton, Architect, Kendal.

KIDWELLY.—Feb. 10.—For Additions to Llandry House. Mr. T. Arnold, Stepney Street, Llanelly.

LEYTONSTONE.—Feb. 15.—For Erecting Iron Building. Messrs. R. L. Curtis & Sons, 119 London Wall, E.C.

LEYTONSTONE.—Feb. 15.—For Erection of Iron Building, for the Guardians. Mr. F. E. Hilleary, Clerk to the Guardians, Leytonstone.

LLANGOLLEN.—Feb. 18.—For Additions to Stores. Mr. H. L. Tacon, 4 Berwyn Street, Llangollen.

MASBROUGH.—Feb. 15.—For Additions to Stores. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

MORTLAKE.—Feb. 27.—For Supplying Broken Granite, Flints, Gravel, &c., and for Paviers', Masons', Bricklayers' and Jobbing Works. Mr. H. Richards, Murthly Villa, St. Leonard's, Mortlake, S.W.

MOUNT PLEASANT.—Feb. 20.—For Second Portion of Parcel Post Office. H.M. Office of Works, 12 Whitehall Place, S.W.

NEATH.—Feb. 14.—For Building Steam Laundry. Mr. S. C. Jones, Architect, 6 Queen Street, Neath.

NEWBURGH.—Feb. 14.—For Building House and Shop. Mr. Alex. Cowie, Architect, The Square, Ellon.

PORTSMOUTH.—Feb. 21.—For Construction, Alterations and Reparation of Sewers, for the Urban Sanitary Authority. Mr. Alexander Hellard, Town Clerk.

PRESTON.—Feb. 11.—For Superstructure of Cross Deaf and Dumb School. Messrs. Sames & Green, Architects, 65 Northgate, Blackburn.

ROSCOMMON.—Feb. 18.—For Supplying and Fixing Three Porcelain Enamelled Baths. Mr. J. J. Shiel, Secretary, Roscommon County Infirmary.

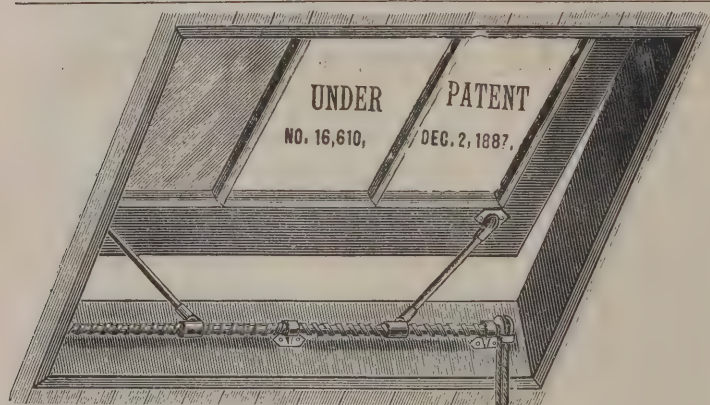
SEDGLEY.—Feb. 18.—For Additions to Board Schools. Mr. A. P. Brevitt, Architect, Red Lion Street, Wolverhampton.

SOUTHAMPTON.—Feb. 16.—For Enlargement of Board Schools, Sholing. Messrs. W. H. Mitchell, Son & Gutteridge, Architects, 9 Portland Street, Southampton.

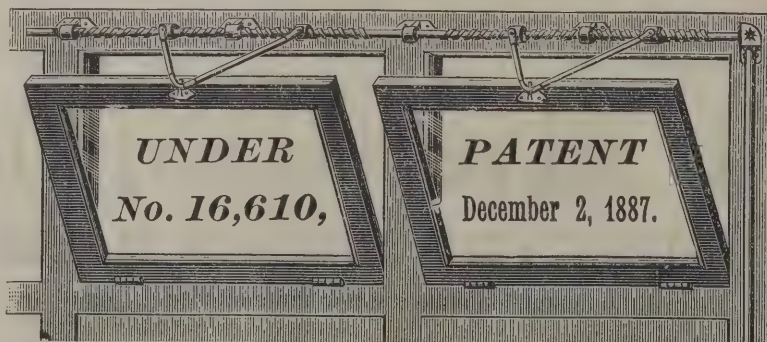
STRATFORD.—Feb. 14.—For Construction of Underground Urinal. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

TONYPANDY.—Feb. 11.—For Additions to Independent Church. Mr. O. M. Roberts, Architect, Portmadoc.

WALSALL.—Feb. 14.—For Building Board Schools. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.



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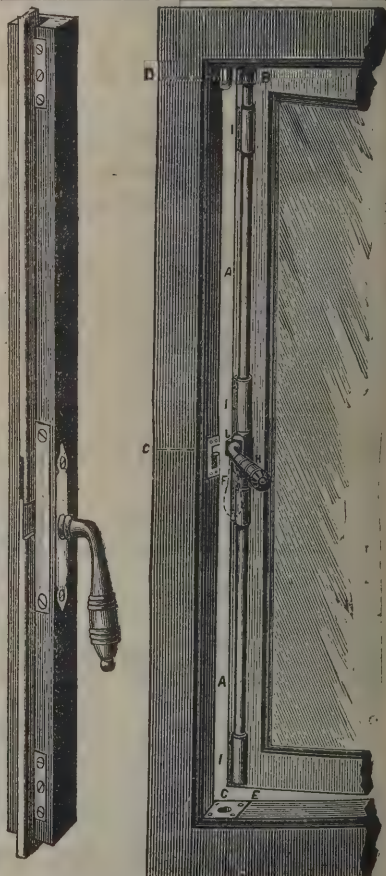
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WALTHAMSTOW.—Feb. 17.—For Building Board Schools, Forest Road. Mr. W. A. Longmore, Architect, 7 Great Alie Street, Whitechapel.

WATH-ON-DEARNE.—Feb. 13.—For Building Wesleyan Chapel, Schools, &c. Mr. J. Wills, Architect, Victoria Chambers, Derby.

WILLESDEN.—Feb. 14.—For Building Public Library, Fire Station, &c., and Supplying Lamp Columns, Granite, Sand, Lime, Cement, Pipes, &c. Mr. O. Claude Robson, Public Offices, Dyne Road, Kilburn, N.W.

WEST HAM.—Feb. 27.—For Erecting Two Organs. Mr. Lewis Angell, Town Hall, Stratford, E.

WORKINGTON.—Feb. 11.—For Building Two Houses. Mr. W. G. Scott, Architect, Victoria Buildings, Workington.

TENDERS.

CWM.

For Building Hotel, Stables, &c., Cwm, Ebbw Vale, for the Caerphilly Brewery Co., Limited. Mr. CHARLES TAYLOR, A.R.I.B.A., Architect, Cardiff. Quantities by Architect.

Davies & Morgan, Ebbw Vale	£5,451	0	0
Bowers & Co., Hereford	4,382	0	0
David Davies, Cardiff	4,380	0	0
Wm. Gradwell, Barrow-in-Furness	4,300	0	0
D. C. Jones & Co., Gloucester	4,244	0	0
Hatherley & Carr, Bristol	4,197	0	0
H. Welsh, Hereford	4,100	0	0
Thomas Evans, Cardiff	3,985	0	0

COOKSTOWN

For Delivery of 620 Tons of Cast-iron Pipes, for the Guardians of Cookstown.

J. & S. Roberts, West Bromwich	£3,330	1	8
Macfarlane, Strang & Co., Glasgow	3,248	10	3
Claycross Company, Chesterfield	3,238	6	2
R. Maclaren & Co., Glasgow	3,172	11	9
R. Laidlaw & Co., Glasgow	3,159	5	2
D. Y. Steuart & Co., Glasgow	3,154	18	8
Stanton Ironworks Company, Nottingham	3,058	13	2
STAVELEY COAL & IRON COMPANY, near Chesterfield (accepted)	3,024	18	1

DARTMOUTH.

For Construction of Sewers, &c., Dartmouth. Mr. T. O. VEALE, Borough Surveyor.

Warfleet Sewers.

Brooke & Ash, Totnes	£96	0	0
L. C. Pillar & Sons, Dartmouth	93	19	0
E. Veale, Dartmouth	82	0	0
E. PIKE, Torquay (accepted)	80	10	0
W. Edgcombe, Strete, near Dartmouth	79	0	0
Rabbich & Brown, Paignton	75	0	0
Surveyor's estimate	74	12	9

Town Sewers.

Rabbich & Brown	753	0	0
Brooke & Ash	750	0	0
W. Edgcombe	750	0	0
E. Veale	743	0	0
L. C. Pillar & Sons	718	0	0
E. PIKE (accepted)	678	0	0
Surveyor's estimate	751	3	4

GODALMING.

For Main Drainage and Sewage Disposal Works, Godalming.

W. J. Botterill	£20,215	0	0
J. Neave	15,481	0	0
S. Kavanagh	14,853	11	0
R. R. Facey	14,056	0	0
B. Cooke & Co.	13,910	0	0
W. CUNLIFFE, Kingston-on-Thames (accepted)	13,747	11	0
P. Peters	12,100	0	0
Morgan, Isted & Morgan	10,486	0	0

HEATHFIELD.

For Building Hotel, Heathfield, Sussex, for Mr. Francis Verrall, C.E. Mr. ALFRED A. OAKDEN, Architect, Eastbourne and Lewes. Quantities by Mr. ROBEY CARPENTER, Burton-on-Trent.

G. Gravett, Eastbourne	£4,597	0	0
M. Martin, Eastbourne	4,460	10	0
W. Backhurst, Eastbourne	4,330	0	0
S. Errey, Lewes	3,954	0	0
Floyd, Lewes	3,935	0	0
Canwell & Son, Eastbourne	3,750	0	0
S. Peerless, Eastbourne	3,690	0	0
P. Dennis, Eastbourne	3,550	0	0
L. HUGGETT, Eastbourne (accepted)	3,407	0	0

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For Rebuilding the Foundry and Portion of Workshops destroyed by fire at the Eddington Ironworks, Hungerford, for Messrs. Cottrell & Co., exclusive of Constructional Ironwork in Roofs, Floors, &c. Mr. JAMES H. MONEY, Architect. Quantities not supplied.

J. Wooldridge & Son, Hungerford £856 0 0
H. Hoskings, Hungerford 792 0 0
G. ELMS, Marsh Benham (accepted) 791 0 0

KENDAL.

For Alterations to Two Dwellings and Stable in the Old Shambles, Kendal, for Mr. John B. Farrer. Mr. JOHN STALKER, M.S.A., Architect, 57 Highgate, Kendal.

J. & R. Dixon, Kendal, excavating, walling and masons' work. Thornton Bros., Otley, slating.

Henry Collett, Kendal, carpenter and joiner.

William Jackson, Kendal, plumbing, glazing and painting.

John Wells, Kendal, plastering and cementing.

LLANDAFF.

For Building Master's House and Cottage, Cathedral School, Llandaff. Messrs. HALLIDAY & ANDERSON, Architects, Cardiff.

Hatherly & Carr, Bristol £1,377 0 0
Stephens, Bastow & Co., Limited, Bristol 1,349 0 0
Dunn, Cardiff 1,271 0 0
Richards, Barry 1,198 0 0
Davies, Riverside, Cardiff 1,197 0 0
Munro, Barry 1,140 0 0
Rodger, Cardiff 1,120 0 0

No tender accepted.

LONDON.

For Erection of Premises, Devon's Road, Bow, E., for Messrs. W. & H. James. Mr. ALBERT E. PRIDMORE, Architect, 2 Broad Street Buildings, E.C.

Taylor & Son £947 0 0
Godson & Son 867 0 0
W. J. Walker 834 0 0
W. J. Davenport 787 0 0
Heatley & Annan 775 0 0
C. J. Sherwood 721 0 0
Coulson Brothers 693 0 0
W. Collins 675 0 0
H. King 610 0 0
W. Wiltshire 585 0 0

LONDON—continued.

For Superstructure of Addition to the Buildings of the Public Record Office, for the Commissioners of H.M. Works and Public Buildings.

B. E. Nightingale £78,554 0 0
J. Shillitoe & Son 76,500 0 0
W. S. Horden & Son 76,000 0 0
Newmans, Limited 75,705 0 0
E. Lawrance & Sons 74,900 0 0
S. & W. Pattinson 73,369 0 0
D. Charteris 70,859 0 0
Perry & Co. 70,117 0 0
J. Allen & Sons 68,746 0 0
Holland & Hannen 68,660 0 0
J. T. Chappell 68,633 0 0
R. L. Holloway 68,139 0 0
Kirk & Randall 67,970 0 0
J. Mowlem & Co. 67,446 0 0
W. Brass & Son 65,333 0 0
FOSTER & DICKSEE (accepted) 64,950 0 0
J. O. Richardson 62,978 0 0

For Repaving Eastern Ambulance Station Yard, for the Metropolitan Asylums Board.

W. J. White & Co., Worship Street £513 0 0
W. Johnson & Co., Limited, Wandsworth 494 0 0
Nowell & Robson, Kensington 492 0 0
Leslie & Co., Kensington 478 0 0
W. Wady & Co., Stoke Newington 459 10 0
A. J. Mundy & Co., Grays 430 10 0
W. Griffiths, Kingsland 422 7 8
W. Neil, Bow 392 10 0
W. O. Williams, Finsbury Park 349 0 0
W. H. WHEELER, Southwark (accepted) 318 0 0

For Building Fire Brigade Station, Cherry Garden Street, Rotherhithe, for the London County Council.

Wells & Co. £6,949 0 0
Balaam 6,650 0 0
Bullers 6,437 0 0
Allen & Son 6,281 0 0
Holloway 6,243 0 0
Richardson 6,037 0 0
Whitehead 5,990 0 0

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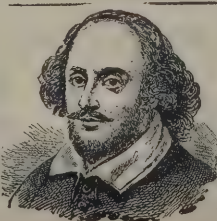
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G. Wernham	3,900 0 0	30 0 0
C. Oldridge & Sons	3,895 0 0	50 0 0
J. S. Kimberley	3,817 0 0	50 0 0
H. Lovatt	3,784 0 0	40 0 0
T. H. Kingerlee	3,757 0 0	100 0 0
S. & W. Pattinson	3,724 0 0	40 0 0
C. Wall	3,699 0 0	13 0 0
Claridge & Bloxham	3,698 0 0	192 0 0
D'Oyley & Co.	3,649 0 0	27 0 0
A. Simonds	3,575 0 0	35 0 0
W. H. Lascelles & Co.	3,540 0 0	60 0 0
Simonds Bros.	3,469 0 0	69 0 0
L. Whitehead & Co.	3,333 0 0	—
McC. E. Fitt	3,267 0 0	50 0 0
T. Martin	3,054 0 0	50 0 0
De Vere, Buckingham & Co.	2,966 14 5	170 0 0

MILLOM.

For Building Police Station at Millom, for the Cumberland County Council. Mr. G. DALE OLIVER, Architect. Quantities by the Architect.

L. Ferguson, Workington	£3,370 0 0
W. Gradwell, Barrow-in-Furness	3,100 0 0
Gray, Mason & Co., Workington	3,065 0 0
H. K. Richardson, Millom	2,998 0 0
R. Cousins, Whitehaven	2,992 0 9
W. Tomlinson, Millom	2,989 0 0
W. Richardson, Millom	2,985 0 0
W. BRADLEY, Millom (accepted)	2,904 7 0

PENYGRAIG.

For Additions, &c., to Board School and Building Infants' School at Williamstown, Penygraig. Mr. J. J. EVANS, C.E., Architect, Sunnyside, Penarth.

M. Julian, Pontypridd	£2,987 0 0
Rees & Coles, Penygraig	2,975 0 0
Thos. Morgan, Penygraig	2,898 0 0
Samuel Evans, Tonyrefail	2,854 0 0
Chidzey & Thomas, Tonyrefail	2,830 0 0
HENRY ROWLING, Penygraig (accepted)	2,698 0 0
Architect's estimate	2,822 0 0

PETERBOROUGH.

For Erection of Residence, Broadway, for Mr. J. H. Duddington. Mr. M. HALL, Architect, Huntly Grove, Peterborough.

Nicholls, Peterborough	£905 5 0
Sibley, Peterborough	775 0 0
Machin, Peterborough	773 10 0
Shepperson, Peterborough	767 0 0
Bridgefoot, Woodstone	745 0 0
D. GRAY, Peterborough (accepted)	721 0 0

PWLLGWAUN.

For Building Infants' School, with Outbuildings, Boundary Walls, &c., at Pwllgwaun, Pontypridd. Mr. J. I. EVANS, C.E., Architect, Penarth. Quantities by Architect.

D. JONES, Treforest (accepted)	£2,324 0 0
Architect's estimate	2,722 0 0

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Fielding & Platt	320 0 0
Tangyes, Limited	316 0 0
CROSSLEY & BROS., St. Bride Street, E.C. (accepted)	307 0 0
Trent Gas-Engine Company (informal)	285 0 0
Dick, Kerr & Co.	255 0 0

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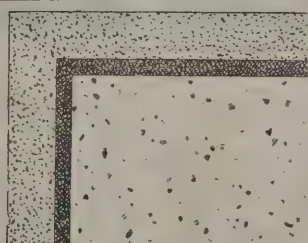
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For Erection of Five Shops in Park Road, St. Anne's-on-Sea.
Mr. HERBERT WADE, Architect, St. Anne's-on-Sea.
Quantities by Architect.

Accepted Tenders.

H. Williams, St. Anne's-on-Sea, brickwork and drainage.
C. Dawson, St. Anne's-on-Sea, stonework.
Sutton & Lord, St. Anne's-on-Sea, plasterer and slater.
Walmsley & Smith, St. Anne's-on-Sea, joiner.
J. Coulston, Blackpool, plumber, painter and glazier.
W. Dilworth, Preston, hot-water heating.

SWANSEA.

For Erection of New Premises and Additions to the Grand Hotel, Swansea, for Mr. A. Freedman. Mr. T. P. MARTIN, Architect, Swansea.

T. D. Williams, Knighton	£1,695	0	0
Bennett Bros., Swansea	1,620	0	0
Billings, Swansea	1,545	0	0
Thomas & Watkins, Swansea	1,475	0	0
T. Richards, Swansea	1,473	0	0
D. Jenkins, Swansea	1,400	0	0
GUSTAVUS BROS., Swansea (accepted)	1,300	0	0
C. Jones & Son, Swansea	1,185	0	0

TOTTENHAM.

For Bruce Grove Schools, for the Tottenham School Board.
Mr. G. E. T. LAURENCE, R.I.B.A., 181 Queen Victoria Street, Architect. Quantities Messrs. by D. CAMPBELL & SON, 69 Finsbury Pavement.

Yerbury & Co.	£20,000	0	0
Reed, Blight & Co.	19,252	0	0
Coldswell & Son	18,124	0	0
Lordon & Son	16,666	0	0
A. Kellett	16,377	0	0
J. Allen & Son	15,925	0	0
R. & E. Evans	15,899	0	0
Fairhead & Son	15,847	0	0
C. Wall	15,700	0	0
J. O. Richardson	15,479	0	0
Doyley & Co.	14,947	0	0

ELECTRICAL.

THE Bewdley Town Council have received the report of the Electric Lighting and Water Committee relative to the possibility of utilising the flow of water in the Severn for the purpose of pumping water for the supply of the borough, and for providing the electric light. They asked for power to incur a small expense for making further inquiries, which was acceded to.

THE Salford Town Council have sanctioned an expenditure of 50,000*l.* for installing the electric light in the central part of the borough, the sum of 30,000*l.* not having been found sufficient.

THE tender of Mr. George Jennings, Lambeth, London, S.E., has been accepted for an installation of Jennings & Brewer's electro-mechanical apparatus to indicate and record in the engine-house of pumping-station, Melton, Suffolk, the variations at every inch in the level of the water in the tower tank at the Suffolk County Asylum. Mr. George Hodson, Loughborough, is the engineer.

TRADE NOTES.

THE Birmingham City Council have authorised the execution of various works of paving at an estimated cost of 23,683*l.*

AN order has been received by Messrs. Shand, Mason & Co. to construct a large and powerful steam fire-engine for the Dublin Fire Brigade. It will have a capacity of 750 gallons of water per minute, and will project a 11-16 inch jet to a height of 195 feet.

THE contract for reseating the parish church of Broadclyst in oak, laying new floors and heating the building (Mr. E. H. Harbottle, architect, Exeter), has been secured by Mr. William Dart, of Crediton, whose tender was selected out of about thirty others.

THE importance of providing ready means of fire extinguishing in hospitals and other buildings devoted to the care of the helpless is fully recognised by the Metropolitan Asylums Board, and they have recently purchased from Messrs. Merryweather & Sons, of London, one of their light "Valiant"

'EPHINX' PORTLAND CEMENT



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1½ inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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pattern steam fire-engines for the protection of the Northern Hospital, Winchmore Hill. Amongst other public institutions having steam fire-engines by the same firm may be mentioned Moulsoford Asylum, Berks, the Royal Naval Hospital at Haslar, the Royal Military Hospital at Netley, &c.

THE following valuable testimonial has been received by Messrs. John Gibbs & Son, warming, ventilating and consulting engineers, of Liverpool, from one of their clients:—"The extractor chimney-cowl you sent me last month has proved a splendid success, having completely cured the smoking of the chimney, which had given trouble for years. Please send me another, the same to fit pot 8 inches inside and 9 inches outside; and kindly have the flange fixed higher up so as to leave 12 inches to go inside pot."

CHICAGO EXHIBITION NOTES.

FOR the convenience of visitors to Chicago during the forthcoming exhibition a mammoth hotel is being erected by the World's Fair Co-operative Bureau. The hotel is in blocks, somewhat after the plan of St. Thomas's Hospital, and will contain over six thousand rooms. These rooms will be let at a uniform rate of a dollar a day to those who pay a nominal registration fee beforehand, and thus secure the right of occupancy at any time during the exhibition. The sole representation of the World's Fair Co-operative Bureau in Great Britain has been placed in the hands of the City Press Agency, 1 King's Arms Yard, and 51 Coleman Street, London, E.C.

THE Norwegian Viking ship to be sent to America for exhibition at the World's Fair was launched at Sandefjord on Saturday, the 4th inst., in the presence of an immense crowd of spectators, and amid great enthusiasm.

ONE of the interesting contributions from England to the exhibition is to be a reproduction of what is perhaps the finest example in this country of sixteenth-century decorative wood-carving. This is the famous banqueting-hall at Hatfield House, the Hertfordshire seat of the Marquis of Salisbury, and has been reproduced by Messrs. Hampton & Sons, of Pall Mall East. The minstrel gallery, which occupies one end of the hall, and the screen, which stands at the other end, have

been reproduced with great fidelity. The hall is to be encased in a building of wood painted to look like stone.

BUILDING AND BUILDERS.

THE Airdrie Dean of Guild Court has the plans for the erection of a free public library for the burgh. The building, which will cost between 2,000*l.* and 3,000*l.*, is to be erected on a free site in Anderson Street, and will be situated between the County and Burgh Buildings. Mr. Andrew Carnegie has given 1,000*l.* to the building fund.

PLANS for the proposed new fever hospital for the burgh of Leith at East Pilton have been approved of by the sub-committee of the Public Health Committee of the Leith Town Council.

A REPORT of the Lunatic Asylums Committee recommending the enlargement of Rubery Hill Asylum, at a cost of 25,000*l.*, has been adopted by the Birmingham City Council.

THE Durham Urban Sanitary Authority have definitely decided on building an infectious diseases hospital for the borough.

PLANS and estimates are to be obtained for the extension of the Scarlet Fever Hospital for the Birmingham City Council, so as to provide accommodation for 150 more patients.

BESIDES the site a sum of 17,000*l.* has been given towards the building and endowment of the new infirmary for Southport, the tenders for erecting which were to be submitted for consideration on Thursday, the 9th inst.

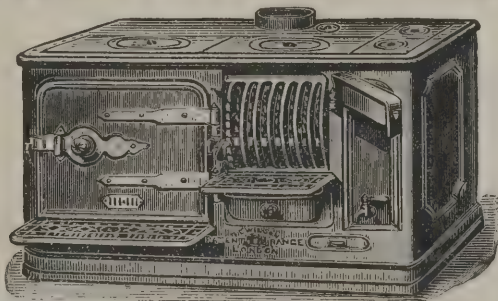
THE *Coventry Herald* says:—"The dispute in the Coventry building trade has been settled on terms satisfactory to both masters and workmen. Delegates respectively appointed by the master builders and the operative carpenters and joiners, met and considered the application of the men for an increase of wages and a more favourable interpretation of the rule relating to overtime. The result of the conference was that after April next, the wages of the men will be increased from 7½*d.* to 8*d.* an hour; that no piecework will be allowed; that overtime will not be allowed except in cases of emergency, when it will be paid for at the following rate:—From half-past five o'clock in the evening, and from five o'clock the eight weeks before and eight weeks after Christmas Day up to eight to be paid time and a quarter; and from eight o'clock up to ten o'clock,

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and from one o'clock on Saturday afternoon up to ten o'clock in the evening, to be paid time and a half; and from ten o'clock up to the ordinary time of starting work each morning to be paid double the ordinary rate, and that two and a half hours' notice shall be given before a man leaves an employer, or before a master discharges a man, such notice to be given so as to expire at the end of any working day.

PLANS have been prepared by Mr. James Milne, Peterhead, for the proposed new fish market to be constructed at Cormack's Slip.

THE *Oxford Chronicle* says:—During the past week the building abutting on the eastern end of Magdalen Bridge, formerly known as Turrell's Hall, has been in course of demolition. Considerable speculation has been rife as to the intention of the owners in regard to the site. We are enabled to state that Magdalen College, who purchased the property some time since, contemplate erecting a block of buildings which will fittingly harmonise with the surroundings. The primary object is to supply a suitable house for the headmaster of the College School, and accommodation will be provided for a large number of boarders.

AT the meeting of the Dudley Town Council the receipt of a communication from Mr. B. Hingley, M.P., was announced, requesting an interview with the borough surveyor as to the desirability of giving warning to several of the inhabitants living in Griffin Street, Netherton, of the dangerous condition of the houses, brought about by mining operations. The Chairman said a meeting of the Sanitary Committee had been held with regard to the matter, and inasmuch as the borough surveyor considered some of the houses and buildings in a dangerous condition, a resolution had been passed to the effect that he be empowered, under the Town and Police Clauses Act, to warn the inhabitants of these houses to move out of them as soon as possible, and to exercise his power to compel them to do so if necessary. Dr. Messiter said it would involve the closing of about sixty houses. It appeared to him a very anomalous condition of affairs that a property-owner should have his houses destroyed without being able to obtain compensation from the mine-owner, whose mining operations had caused the mischief.

AT the meeting of Cambusnethan School Board a discussion took place as to serious difficulties owing to the discovery of extensive pit workings beneath the site of the proposed new public school at Wishaw. The Board caused a shaft to be

sunk at the spot, with the result that disused workings of a remote date were found to exist. The engineer, Mr. Tait, reported that to make the site secure supporting pillars would have to be built in the workings, and a large quantity of blaise cleared out, and the cost of these operations, together with what had already been done, would probably amount to 800*l.*—an outlay not included in the estimated cost of the school. It was decided to proceed with the underbuilding.

A WRIT has been issued by Messrs. Holloway Bros. against the London School Board for payment of 245*l.* 1*s.* 2*d.* alleged to be due to them for work done under the Repairs Schedule, 1889-90. A claim is also made for costs amounting to 3*l.* 3*s.* if the account shall have been paid within four days from the date of the writ. A formal tender in cash amounting to 100*l.* 18*s.* 10½*d.* had previously been made to Messrs. Holloway Bros. to settle the account, but had been refused.

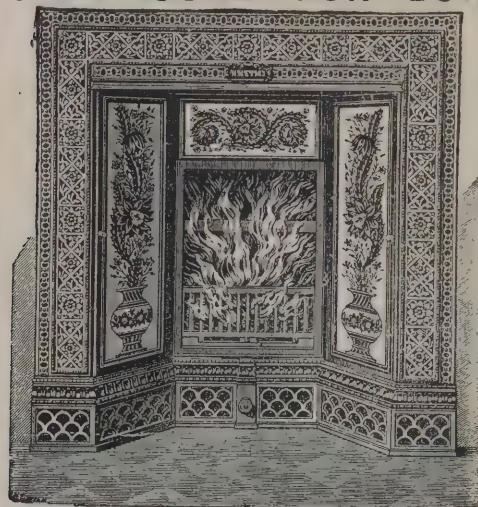
VARIETIES.

THE Irish Great Southern and Western Railway Company propose to expend 25,000*l.* in providing hotels in the south of Ireland for tourists on the plan adopted in Switzerland.

THE Bishop of Winchester has declared that although the last code of instructions of the Education Department to inspectors throughout the country might destroy some of the feebleness of voluntary schools, it seemed almost impossible to take objection to the proposals. It was the bounden duty of the Department to put all voluntary and Board schools in the highest state of efficiency, and although it seemed rather hard on the Church, after using her buildings and organisations for so many years, to call upon her somewhat summarily to put them in order without any assistance from the public, yet the principle was one which it was impossible to dispute.

IMPORTANT sanitary improvements have been effected in the west, south and surgery wings of St. Bartholomew's Hospital, at an expense of 9,593*l.* The new main drainage works have now been completed. All the old sewers have been broken up and removed, and a system of drainage by means of glazed earthenware pipes, with intercepting chambers and manholes, have been substituted. The entire works were executed in a very satisfactory manner by Messrs. Mowlem & Co., under the direction of Mr. E. B. P'Anson, the surveyor to the hospital, at

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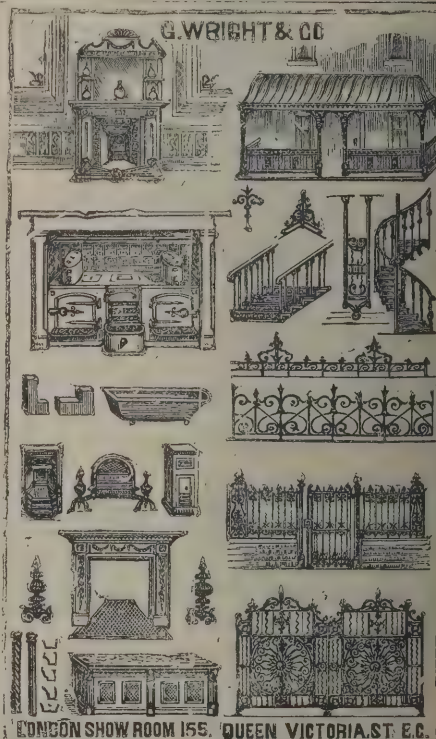
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WORKS, ROTHERHAM. Estab. 1854.

a cost of 6,397 $\frac{1}{2}$., and the whole section has been working efficiently for the last six months. The works were carried out without in any way stopping the general work of the hospital, though that at times was a matter of no small difficulty.

HER MAJESTY has granted the prayers of the petitioners who asked that Leeds and Sheffield should be raised to the rank and dignity of cities.

A PETITION is to be presented to the Commissioners of Sewers asking that Upper Thames Street should be widened. The improvement has actually been in hand since the year 1858, when about seventy premises were set back at a cost of 91,244 $\frac{1}{2}$ 5s., to which sum the old Metropolitan Board of Works contributed 16,375 $\frac{1}{2}$., leaving 74,869 $\frac{1}{2}$., as the net cost to the ratepayers. Under the present scheme some thirty-five premises will need to be set back.

THE First Commissioner of Works, in reply to a question about the delay in the erection of the new buildings for the South Kensington Museum, stated on Monday that the new buildings involve a very large outlay of money—above 400,000 $\frac{1}{2}$.,—and in view of the many other public buildings in progress, which will cause a great increase to the building vote for the next financial year, the Chancellor of the Exchequer has found himself unable to include any amount for that year for the commencement of the South Kensington extensions.

THE late Duke of Marlborough in his will suggests, but without making it obligatory, that the Duchess may see fit to lay out 3,000 $\frac{1}{2}$ in restoring Bladon Church.

AN inquiry has been held by the Local Government Board into the application by the Preston Corporation for power to borrow 95,000 $\frac{1}{2}$ to improve the borough water-supply, by constructing an additional reservoir of 27,500,000 gallons capacity and a 36-inch iron main. There was no opposition.

WORK has been commenced on the New River Walk improvement for the Leamington Corporation. About 3,500 square yards of land on the old Perkins's gardens site has been purchased to be laid out as a garden and to connect it with the New River Walk on the one hand, and, by means of a light iron bridge across the Leam, with the Pump Room gardens on the other. The cost of the extension will be about 1,000 $\frac{1}{2}$.

THE appeal of the Withington Local Board against the judgment of Mr. Justice Chitty refusing an injunction to restrain the Corporation of Manchester from erecting a smallpox hospital at Withington has been dismissed by the Court of

Appeal. In delivering judgment Lord Justice Lindley said the Local Board had no right under the Act to prevent the erection of the hospital.

AN inquiry has been held at Clitheroe into an application by the Corporation for a provisional order to purchase land for the purposes of a sewerage farm for the borough, and also to borrow over 20,000 $\frac{1}{2}$ to carry out the scheme.

A PROJECT is being warmly supported by the inhabitants at Tenby in favour of constructing a promenade pier and landing stage 1,500 feet long with a concert pavilion. The cost is estimated at 30,000 $\frac{1}{2}$.

THE Barnstaple Urban Sanitary Authority have resolved to apply for a sum of 4,500 $\frac{1}{2}$ for public works and street improvements.

THE Works Committee of the Edinburgh and District Water Trust have resolved to recommend the expenditure of a further sum of 50,000 $\frac{1}{2}$ on the borings at Posso, in consequence of the increased depth to which it has been found necessary to carry the borings down.

THE Darlington Town Council at a meeting held on the 2nd inst. in considering the minutes of the Technical Instruction committee, moved by Councillor Dr. Manson (chairman of the committee), adopted the following recommendations:—That 1,500 $\frac{1}{2}$ be paid to the devisees of the late Mr. Jno. Beaumont Pease for 2,082 superficial yards of land adjoining Northgate on the North Lodge Estate, for the purpose of erecting a technical college, the funds available for the building itself being calculated near 12,000 $\frac{1}{2}$ up to the present. Also that a sub-committee should be appointed to consult with Mr. G. G. Hoskins, F.R.I.B.A. (the architect appointed by the council), as to the provisions required in the building.

A MOST useful and instructive essay, by Mr. W. Santo Crimp, M.Inst.C.E., has just been published by Mr. R. J. Bush, of Fleet Street, under the title of "Sewage Treatment and Sludge Disposal." It is the more valuable, as it brings before the reader the latest experiences of science as applied to sanitation.

IT has been decided to extend operations in connection with the coal boring at the Channel Tunnel works near Dover. The preparations for sinking a working shaft are already well advanced, and additional sheds, &c., have been erected. The shaft is about 50 yards west of the boring. It is stated that the boring during the last few weeks has amply confirmed the

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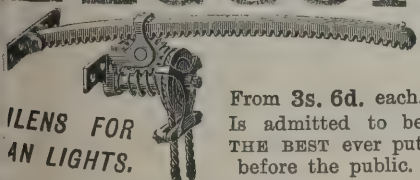
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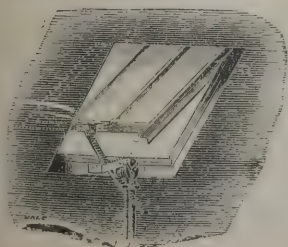
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THE "WILMOS."

anticipations of the promoters, of the existence of workable coal seams similar to those on the other side of the Channel.

THE Mexborough Local Board have, it is understood, decided to offer the sum of 10,000*l.* for the local waterworks undertaking.

THE *Aberdeen Free Press* says:—We understand that a movement is in progress among the royal tradesmen in Aberdeen to have a bronze statue of Her Majesty the Queen erected on the site at the corner of George Street formerly occupied by the statue of Her Majesty, now in the Town House vestibule. The consent of Her Majesty has been received, we believe, and the proposal has been very cordially taken up by those concerned.

THE *Leeds Mercury* says:—In connection with the Students' Sketching Club, Leeds School of Art, Dr. Jacob gave on Saturday afternoon an interesting lecture, illustrated with lantern slides, on "Trees in Winter Landscape," to a large number of students.

It is proposed to provide at the Scarborough Harbour an additional area of 1,050 square feet for the purposes of the fish trade, and for the goods trade to enclose a space of 180 square feet to the south-west corner of the goods shed.

THE *Gloucester Chronicle* says:—In regard to the search for an additional water supply for the city, the experimental boring which has been going on for some time near Newent seems to promise most important results for the future of Gloucester in furnishing the supplemental supply which has been sought so long. The chief doubt which has hung over the experiments has arisen from the suspicion that the contiguity of the new red sandstone, though well known as affording splendid water-bearing strata, might result in tapping the sometimes adjoining salt-bearing strata, and thus make the water brackish. The tasting test so far has shown that there is no trace of salt.

In the *Atlantic* for February, the Rev. Julius H. Ward, in an article, "White Mountain Forests in Peril," speaks strongly of the urgent need of stopping the wholesale destruction of these forests before it is too late. The present condition of these forests indicates that the lumbermen are taking yearly about six hundred million feet of rough timber from the White Mountain region and the sources of the Connecticut. Either every valuable tract of timber land has been bought by lumbermen in order to take from it all its valuable spruce timber, or it is held by the original owners, who have signed contracts for the cutting of the timber under certain conditions of stumpage.

THE Boston Harbour Commissioners have decided to instruct Mr. W. H. Wheeler, engineer, to prepare plans and estimates for a new dry dock, to be constructed at a cost of about 5,000*l.*

THE Clontarf Commissioners have confirmed a resolution about obtaining a loan for the erection of a town hall on the site leased from Lord Howth at Whitehall, Clontarf, co Dublin.

A SMALL explanatory pamphlet on the fund started from the surplus of the late Royal Naval Exhibition has been issued, the public having taken such a deep interest in the exhibition.

At the general meeting of the Manchester Society of Architects (Incorporated), Mr. Salomons, president, in the chair, Mr. H. Ross, of Accrington, was elected a Fellow, and Mr. A. J. Murgatroyd an Associate of the Society. A paper was read by Mr. John Slater, B.A., A.R.I.B.A., on "The Buildings of the Ancients," which was illustrated by numerous diagrams, and listened to with much interest. The R.I.B.A. prize drawings were on view in the room.

EMPLOYERS' LIABILITY.

THE principal difference between Mr. Asquith's Employers' Liability Bill and that of which Mr. Matthews had charge during the existence of the late Government is, says the *Times*, that the former abolishes altogether the doctrine of common employment. Mr. Matthews did not go so far as this. Generally speaking, his Bill extended the liability of the employer, so as to make him responsible for the acts of any person in a position of responsibility, even though such person was an ordinary manual labourer; and he also extended it to the subcontractor. Another point of divergence is contained in the section providing against contracting out of the Act. Mr. Asquith's Bill prohibits this *in toto*, whereas Mr. Matthews made an exception in the case of existing funds contributed to by the employers as well as by the employed, such as that started on the London and North-Western Railway at the Crewe works. An important provision of Mr. Matthews's Bill—that getting rid of the doctrine *volenti non fit injuria*—is omitted from the measure now submitted for consideration. By the repeal of the Act of 1880, and the abolition of the doctrine of common employment now proposed, the limit of compensation, which in the scheme of the late Government was put at 250*l.*, would disappear.

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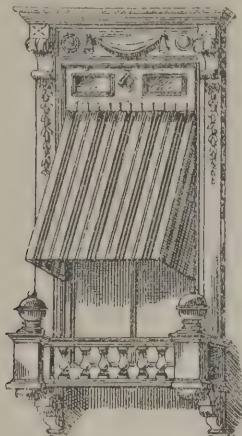
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NOTES ON NOVELTIES.

WITH the advent of spring, window-blinds will, no doubt, be in considerable request by many of our readers. We have pleasure, therefore, in calling attention to the firm of Messrs. F. S. Smith & Co., 46 and 48 Clifton Street, E.C., who have a reputation for high-class window-blinds of all descriptions.



Embroidered blinds in all colours and designs are a specialty, and their bright effect in exterior decoration is generally appreciated. Messrs. F. S. Smith & Co. turned out over 8,000 Venetian blinds during last season—a testimony to their merits. One chief excellence consists in the colours being heat-resisting. This is due to the attention paid to the quality of stain and varnish used.

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STUDENTS' PRELIMINARY EXAMINATION.

Of the candidates who presented themselves at the Preliminary Examination of the Surveyors' Institution, held concurrently in London and Manchester on the 25th and 26th ult., the following satisfied the examiners:—

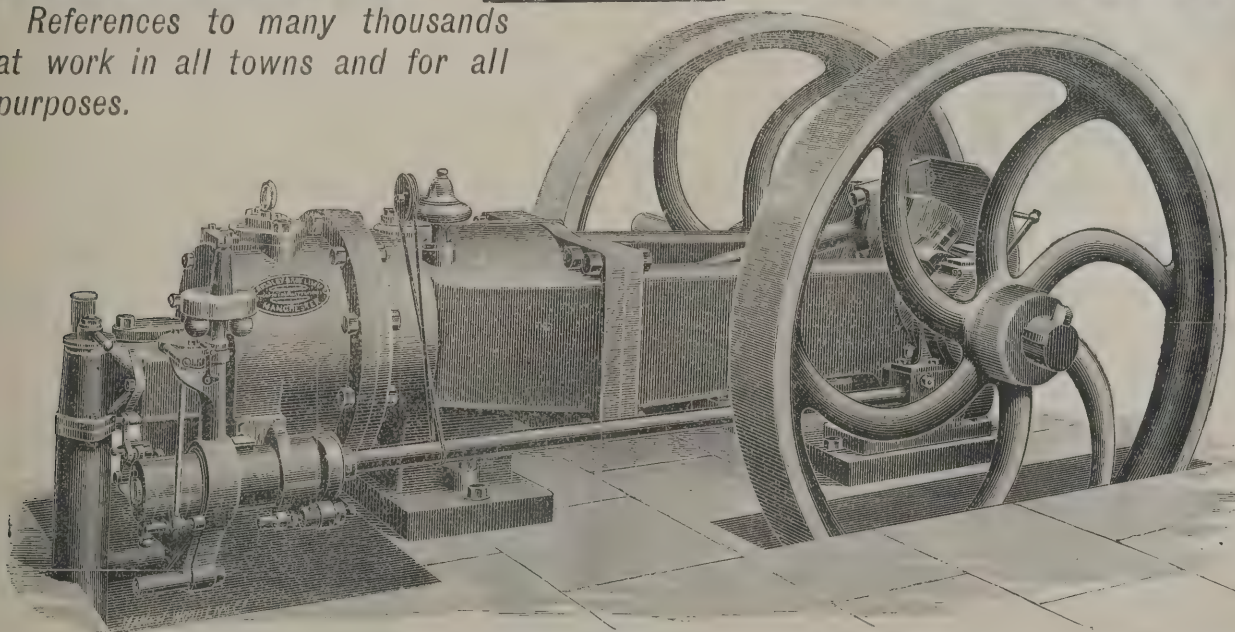
Messrs. Herbert Adams, Richard Maurice Bell, Harold Edwin Bentley, Thomas Darby Berry, Francis Julian Laurence Birch, Arthur Frederick Brown, Henry Herbert Philip Burgess, John William Clarke, Henry William Cobb, Richard Ernest Cole, Wilfred Lee Cowell, Norris Tynwald Cowin, Keston Nelson Crowther, Francis Herbert Dickson, George Herbert Eastwood, Ernest Sydney Evans, Edward Charles Foster, Arthur Edward Green, Albert Grove, Richard Thomas Grove, Gilbert Lionel Hankey, George John Robertson Harrison, Arthur Musgrave Hawkins, Edgar Wilfred Hooper (passed at head of list), Arthur Frank Howland, Ernest Amphlett Huskinson, Alfred Stuart Little, Algernon Knight Lofts, Leonard William Crandall Lorden, Charles Lovegrove, George Edward Luck, Arthur George Marshall, Stanley Arthur Martin, John Miller, Arthur Richard Morrall, Godfrey Nettlefold, Montague Charles Oldman, Percy William Overell, Arthur James Oxley, Charles Frederick Pearce, Octavius Burroughes Pearse, John Brooke Wood Robinson, Arthur Ernest Rome, Joseph Taylor Rook, Sydney Hubert Shaw, William Shepherd, Arthur Plumbe Smith, Henry Smith, Charles Herbert Southorne, Roland O'Brien Thompson, Lewis Tomlinson, Reginald Seward Truman, William Frederick Wallis, Frank Edward Ward, William White, jun., Llewelyn Irby Steuart Williams and John Wilson.

BROCKLEY TILE AND MOSAIC WORKS.

THE utility of tiles has increased of late by leaps and bounds. Whether it be for adding to the artistic effect of a space difficult of treatment or assisting sanitary science in rendering wholesome and sweet the public urinals and lavatories in our streets, we must admit the help that is found in the bright, cleanly and artistic tiles that are so much used. Wishing to be, as it were, "up to date" in the latest ideas and designs, we sent a representative to visit the galleries and showrooms of Mr. Alfred T. S. Carter, at Brockley Road. Looking at his premises from outside, it was impossible to believe where the vast stock was stored which we afterwards had the advantage of seeing, and even now Mr. Carter finds his premises not large enough for his increasing business, and he has in consequence just taken a

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spacious building opposite and is also engaged in altering and turning into a warehouse the premises next his. In walking through the showrooms we were greatly interested in the assortment of beautiful and artistic colours obtained, not the hard unsympathetic blues, reds and greens of seven or eight years ago, but delicate and rich shades of bronzes, blues, ambers and reds. One example with a running pattern of clematis was very happy in effect, and we were told that this was the last new tile that Mr. Carter had just designed. There were numbers suitable for dados and hearths, some thousands of which have just been printed in order to keep pace with the demand for them. We also noticed a new wall-lining in soft cool green, with a conventional spray in the centre. Coming to embossed tiles, a very large assortment of soft peacock blues and browns and ambers was in stock, and many were packed ready to go away for large orders. Some of the latest designs were renderings of pomegranate in different tints. For milk businesses, butchers' shops and, in fact, in any place where coolness and cleanliness are of importance, tiles are an absolute necessity, and when necessary an artistic finish should be considered equally indispensable. Mr. Carter has done the tiling-work for numbers of hotels, public-houses, dairies and other premises, amongst which we may mention the Royal Victoria Hotel, Hastings, the Shakespeare at Woolwich and the Lancashire at Liverpool, nearly all the Mecca cafés so popular in the City, and many others. In one of the showrooms we noticed some large painted tile panels just ready for fixing in a dairy, and the subject, a number of cows in a meadow, was very applicable and pretty in effect. There were numerous examples of mouldings from 1 inch to 3 inches wide for frieze-rails, dado-rails and borders to panels in all tints. One with frieze and moulding combined was a very good combination. As the fashion is to have tile curb fenders, Mr. Carter has studied to get long lengths of these in which there was no trace of warping, usually so prevalent, and with regard to tile-hearths their name was legion. In the encaustic and vitrified store-rooms we saw tons of these much-admired tiles of all sorts, shapes and sizes, of the most beautiful designs in whites, blues and greens, and others in sage green, dark greens and buffs, suitable for the aisles of churches, &c. Here also was a stack of 3-inch blacks and whites of admirable sharpness, uniform thickness and tone just being sent off to North America. Of course, in these days of cheapness one must cater for every class, and Mr. Carter has numerous specimens of second quality of all prices for walls, hearths, &c. In the unglazed department, which

has lately become a most important branch, there were all sizes in blacks, buffs, reds, greys, chocolates and salmons, from 1 inch to 6 inches square. Further on we came to the unpacking and packing rooms. These are full of specimens just received or being despatched. One lot of carefully selected red tiles attracted our notice, when Mr. Carter broke one to show us the grain and texture, which was even and hard throughout, and when struck rang like a bell. It is most difficult to get several batches of even colour, size and sharpness, but from the enormous stock we carefully selected and compared many samples so good that it would be impossible to distinguish one from the other in either of these points. The large building we have before referred to is used almost exclusively for marble and ceramic mosaic, and in order to fully appreciate the beautiful designs and workmanship, we carefully noticed many examples from these in hand and in course of completion. Mr. Carter has a number of trained Italian workmen for this large branch of the business, which is growing daily. One can scarcely go into any new building in the City or West End now without finding marble mosaic extensively used, and we think rightly so, for it is after all a revival of some of the work done by the most enterprising nation the world has ever seen. Among others we may mention an effective design representing the arms of Kent, "The White Horse." This Mr. Carter is going to put down on his own premises. Then there are several large panels intended for the forthcoming Building Trades Exhibition, and a delightful reproduction from Winchester College, which is supposed to be the smallest marble mosaic figure in England. In bins round the walls were a large assortment of differently coloured hexagonal tesserae for ceramic mosaic. These make nice floors, and lay with a close joint. The space at our command will not permit us to further detail the vast assortment of tiles of every shape, size and tint amongst Mr. Carter's stock, but architects would do well to pay a visit to Brockley in order to fully appreciate what we have endeavoured imperfectly to describe, viz. that he claims to keep the largest stock in London, which we should imagine is perfectly true.

THE MANCHESTER SHIP CANAL.

THE half-yearly meeting of the Manchester Ship Canal Company was held on Monday. The report stated that a Bill has been deposited in the present Session of Parliament to enable



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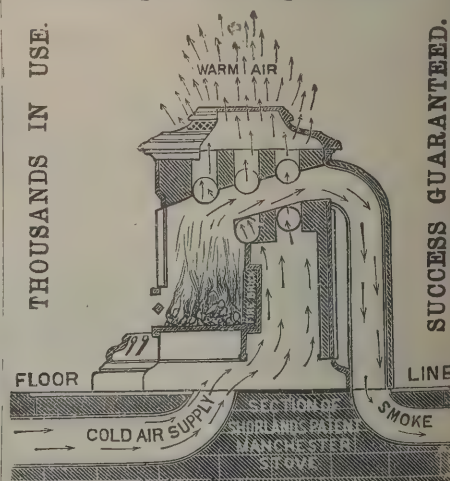
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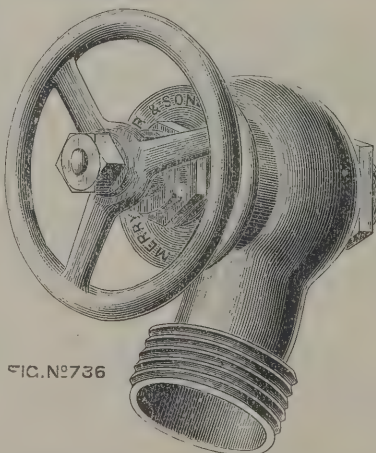


FIG. NO. 736

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the company to raise additional loan capital not exceeding 2,000,000*l.* for the completion of the undertaking at a rate of interest not exceeding 4½ per cent. per annum. The Corporation of Manchester has also deposited a Bill to authorise the corporation to lend the company any additional sums not exceeding 2,000,000*l.*, and it is also provided that any other municipal corporations may contribute towards such further loan. The Corporations of Salford and Oldham have deposited Bills to authorise them to lend the company any sums not exceeding 1,000,000*l.* and 250,000*l.* respectively.

The total area of land purchased to date is about 4,513 acres, the purchase money for which, including compensation for interference, amounts to 1,133,459*l.*, in settlement of claims amounting to 2,187,020*l.* Applications continue to be made for the purchase of surplus lands, and several plots have been sold by the company for works at various points on the canal. The Corporations of Manchester and Salford are applying to Parliament for power to purchase land belonging to the company for the erection of abattoirs and cattle lairages.

The following is the report of the executive committee on construction of works :—"During the past half-year satisfactory progress has been made with the general works, which are expected to be completed by the end of the year; that portion of the work which was let by tender has been pushed on with much vigour, and there is every reason to believe that the contractors will finish within the time specified. The five deviation railways are now finished. The deviation of the Cheshire Lines Railway between Flixton and Irlam has been passed by the Board of Trade, and goods trains are now being worked over that line. The Board of Trade has also inspected the deviation railway between Glazebrook and Partington, and the junctions of the other deviation railways near Warrington. The works on the Runcorn section have been carried on in a satisfactory manner, and although they could not be commenced as early as the other portions of the canal, in consequence of the necessity of first making provision for the accommodation of the River Weaver traffic, it is anticipated that they will be completed concurrently with the remainder of the works during the present year.

"The floods of last autumn brought down into the canal a very large quantity of cinders, ashes and silt, and have thus augmented the quantity of material to be dealt with by dredging. Two powerful dredgers, which were provided for in the estimate of June last, are now being constructed at the Salford Docks, and will shortly be ready for work. If no

further unforeseen contingency arises, there is no reason to believe that the cost of the works for the completion of the canal as set forth in the estimate of June 1892 will be exceeded."

During the half-year 700,997 tons of traffic were carried over the opened portion of the Ship Canal, and although nearly the whole of the present traffic has to be admitted free of toll the net revenue has covered the working expenses. In addition to the above-mentioned traffic 611,896 tons of dredgings were carried. The quantity of traffic loaded, discharged and trans-shipped at Saltport during the half-year was upwards of 100,000 tons, and consisted of Runcorn (Bridgewater Canals) traffic, materials for the works and Ship Canal traffic, such as timber, salt, sugar, pitch, resin, &c. Two regular lines of steamers are now running between Saltport and London and Glasgow respectively.

The report was approved, as well as the Bill for enabling the company to raise the additional capital.

REGISTRATION OF PLUMBERS.

A DEPUTATION of representatives of the British Institute of Public Health (of which Sir Charles Cameron, M.D., is the president, and Dr. Henry Littlejohn, Edinburgh, the president-elect) and metropolitan medical officers of health, representatives of the metropolitan vestries and boards of works, and others, waited upon the Lord Mayor to request him to afford facilities for holding at the Mansion House a conference of medical and sanitary representatives to discuss the questions of the training and examination of sanitary inspectors and plumbers, and kindred subjects.

Mr. Ernest Hart, chairman of the Parliamentary Bills Committee of the British Medical Association, said that the British Medical Association represented some 16,000 medical men, and he heartily supported the application of the deputation. The Association, in conjunction with other medical and sanitary bodies, had taken a great deal of trouble to persuade the Government to require certificates of competence in the case of sanitary inspectors and other persons engaged in sanitary work. They had been so far successful that it was provided by the Public Health (London) Act, 1891, that sanitary inspectors appointed on and after January 1, 1895, should be required to possess such certificates. This applied to the metropolis only, but it was satisfactory to note that already, some time before the Act would come into operation, there was a distinct and growing

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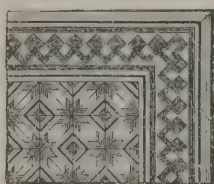
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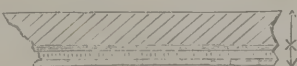
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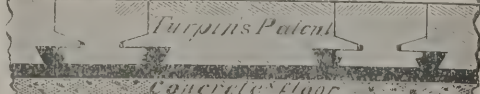
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demand for like regulations throughout Great Britain and Ireland. This demand had not been yet complied with; not from want of willingness on the part of the Government, but from pressure of public business.

Professor W. R. Smith, medical officer to the School Board for London, in support of the application, read a letter from Dr. Henry Littlejohn, medical officer of health, Edinburgh, consulting medical officer to the Board of Supervision for Scotland, and president-elect of the British Institute of Public Health, urging the need for the discussion of the important questions of the training and examination of sanitary inspectors, the education and registration of plumbers, the treatment of infectious diseases in this country, &c. Dr. Littlejohn affirmed that a conference on these subjects, held under the presidency of the Lord Mayor, would strengthen the claims of the sanitary authorities of Scotland for a new Public Health Act for Scotland.

Dr. S. R. Lovett, medical officer of health, St. Giles's, and president of the Metropolitan Branch of the Society of Medical Officers of Health, said that as a medical officer of health of many years standing he had great pleasure in supporting the request of the deputation. The Lord Mayor had done so much for the public health in connection with the plumbers' registration movement, that they felt every confidence in asking him to aid the proposed conference.

Mr. H. Mansfield Robinson, LL.D., clerk and solicitor to the Shoreditch Vestry, said that his connection with one of the sanitary authorities of London gave him continual opportunities of witnessing the constant trouble and difficulty caused by the unskilfulness of those who were carrying out the sanitary work of London. It was satisfactory to note that so far as the provinces were concerned we had now a code of sanitary laws which left little to be desired. The important powers thus conferred upon sanitary authorities were most drastic, and had put owners of house property to considerable expense in consequence; much prominence had been given to the great necessity for executive sanitary officials being thoroughly well skilled and trained, so that they might command the respect of builders and others upon whom they had to serve orders and notices. He pointed out that the provisions of the new Public Health Act, which required sanitary inspectors to possess certificates of competency, would do more harm than good unless such certificates were only granted after a proper practical test.

Dr. T. R. Richardson, chairman of the Woolwich Local

Board, said he had been trained as a practical engineer, and, as a member of a sanitary authority, he was being continually brought into contact with sanitary inspectors and their work. He fully endorsed what had been said by the other speakers as to the necessity for sanitary inspectors receiving a thoroughly practical training in the work which they were called upon to inspect.

Dr. Simpson, medical officer of health, Calcutta, said he had watched with great interest the work which the Lord Mayor had done in connection with the promotion of the movement.

The Lord Mayor said that, as master of the Plumbers' Company and as Lord Mayor, he was pleased to welcome the deputation. As there was to be a congress of port sanitary authorities of England and Wales at the Guildhall on February 17, on the subject of the prevention of cholera, he thought that the conference suggested by the deputation should take place at the Mansion House the next day.

The conference was accordingly fixed for the 18th inst.

PRIVATE BILL LEGISLATION.

A PARLIAMENTARY return just issued reveals that in promoting or opposing Private Bills before Parliament from 1886 to 1891, both years inclusive, the City Corporation expended nearly 17,000*l.* The Commissioners of Sewers spent another two and a half thousand, and the London County Council or its predecessor, the Metropolitan Board of Works, 47,000*l.* Thus altogether over 66,000*l.*, or 11,000*l.* a year, is the cost of the present Private Bill system to London. Borough corporations throughout England and Wales have paid in the same time nearly 343,000*l.*; the local authorities in Improvement Act districts have also spent over eleven and a half thousand pounds; and Local Boards throughout the English and Welsh counties, 119,000*l.*, so that altogether in England and Wales, excluding London, not far short of 474,000*l.*, or 79,000*l.* a year, has been spent over Private Bill legislation, with London about 90,000*l.* a year. Scotland paying at the rate of more than 18,000*l.* a year for her much smaller business, is, it will be seen, proportionately much more heavily fined for Private Bill legislation. Ireland's costs for promoting or opposing Private Bills in the same period were only 4,600*l.* a year. There are some expenses of harbour and dock authorities not included in these figures. In addition are infinitely larger sums expended

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by railway companies, tramway companies, gas and water companies, and canal companies. Their expenses grouped together for the six years exceed two millions, and have, in fact, amounted to nearly 350,000*l.* a year.

WORKS AT RAMSGATE AND DOVER.

At the meeting of the Society of Engineers, on Monday, Mr. W. A. M'Intosh Valon, the president, delivered his inaugural address. He said that the rapid development of the principles of engineering science conducing to the health, wealth and longevity of the human race, could but be gratifying to all, and although the colossal achievements of eminent men for the time astonish the world, the everyday questions of water supply, sanitation, gas supply, the application of electricity, general municipal work, and the education of our young engineers, must hold the field in interest with the general public as with themselves. Mr. Valon devoted a large part of his address to the problem of metropolitan water supply. After discussing various proposals he came to the conclusion that a sufficient quantity of water would be obtained from the district between London and the south coast in a more or less direct line, and the coast east of this line, for the supply of a great part of the metropolis, without injuriously affecting or materially diminishing existing streams. But an efficient supply of meterage would have to be used to check the existing guilty extravagance in the use of water.

Mr. Valon described the new harbour works at Ramsgate and Dover. At Ramsgate he had charge. The work from which most difficulty was apprehended was the construction of the new sea-wall across the inner harbour. It was determined to do this work between the rise and fall of the tide, rather than incur the large expense for damming. It has been carried to a successful issue, notwithstanding the existence of springs of considerable size running out from the cliffs. These were gathered up into glazed pipes, laid in the centre under the foundation of the wall, and allowed to discharge at a low point by gravitation, or pumped when necessary by centrifugal pumps. The foundations, wall and counterforts are solid concrete to Ordnance datum; and from this point the wall is faced with Portland stone removed from the old wall, backed in with concrete and with granite coping 2 feet deep and covering the entire thickness of the new wall. Although this wall cuts off a part of the inner basin, it will, as a matter of fact, provide

greater accommodation for shipping, as part of the work consists of deepening the inner harbour, in order that vessels may berth alongside the whole length of the quay. The rising road is carried on arches. These have the principal part of their foundation on the old Military Road wall. The made piers, foundations and walls to the springing are solid concrete, the arches being turned in brick and cement, with a vertical bond throughout, and worked with ornamental facing to the front of the arches and cement piers, so as to give when complete the appearance of an ornamental brickwork construction. As will be understood, the road is not a level viaduct, but descends at an uniform gradient of 1 in 25, until it reaches the centre of the town fronting the sea. From that point it rises to the east, following the natural conformation of the ground, until the highest part is reached, and to do this it is necessary to remove an hotel with a frontage of 132 feet, which has been acquired for the purpose. The whole work when complete will connect the east and west cliffs by a roadway 2,500 feet long, varying in width from 45 to 70 feet. The improvement also embraces the widening of the lower or level road to the Chatham and Dover Railway, by clearing away the storehouses, Customs House, Harbour Master's house, and all buildings and obstructions which might interrupt the view of the mouth of the harbour and the Downs beyond.

The authorities of the adjoining town of Dover have commenced harbour works of a very extensive kind, which, when complete, will doubtless bring additional trade and prosperity to the town, and also form a very desirable place of shelter to accommodate shipping of the largest class.

Half a century ago a Royal Commission recommended that extensive harbour works should be undertaken. The lines then indicated, after a lapse of forty years, were confirmed by another body appointed to consider the subject. Between those dates no fewer than nine other schemes were put forward. The national harbour then proposed, which was to have been built at the expense of the State, and extended across the entire sea front of Dover, east of the Admiralty Pier, has now given place to a purely commercial undertaking promoted by the Dover Harbour Authority, who obtained the necessary Parliamentary powers readily granted, authorising the Dover Harbour Board to defray the cost by imposing a tax of 1*s.* per head on every passenger embarking or disembarking at the port. Even on the basis of the present revenue, this impost will yield an annual return of at least 16,000*l.*

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or approach from the front of the esplanade, a little to the east of the Granville clock-tower, which is to be taken down and rebuilt. This approach consists of thick walls of concrete faced with granite. The roadway and footpath will be protected by an exterior coating of asphalt, the walls resting upon concrete cylinders sunk to the chalk and filled solid. Starting from the sea abutment of this approach, there will be an open iron viaduct, 1,260 feet long, arranged in bays of iron piles 40 feet apart, stiffened at three points laterally by braced piers, so as to give due rigidity to the work. Each of the ordinary bays will rest upon three piles, but the braced piers will have five piles. The level of the deck of the viaduct will be 19 feet above high-water spring tides, so as to lift it above the reach of the sea during the heaviest gales. The viaduct will have a uniform width of 30 feet throughout its entire length, there being two sidepaths, each 6 feet wide, and a central roadway 18 feet wide. It is proposed that the structure shall be carried on three rows of latticed girders, supported by wrought-iron piles securely braced together, the piles being in all cases driven deep into the chalk and filled in with concrete. Along the shore there is a considerable deposit of sand and fine gravel, reaching a depth of 20 feet, and gradually tapering away towards deep water. The piers nearest the shore will penetrate this bed of sand and gravel, and rest in the chalk; while the piers supporting the outer section of the viaduct will be driven into the bare chalk. On the girders a roadway will be formed of corrugated plating $\frac{3}{8}$ -inch thick, rivetted together so as to form a continuous table from one end to the other. The corrugations will be filled in with concrete, and on this paving blocks of jarrah timber will be laid. The footpaths consist of Portland cement concrete laid upon the ironwork, with French asphalt surfaces. Iron is to be used for the mouldings, curves and gutters, and a neat handrail will be erected at each side of the pier. At the three points chosen for the stiffening bays open iron seats will be provided, while in the middle bays there will on each side be a covered screen 100 feet long, capable of affording shelter to a large number of persons. Between these bays the width over all will be 52 feet, the side structures causing no interruption in the promenading space of the pier.

The viaduct will be followed by a solid pier 1,500 feet long, consisting of concrete blocks, ranging from 12 to 20 tons in weight. Above low-water mark these blocks will be faced with granite and in all cases they will be founded on the chalk, excavated to a depth of about 3 feet and levelled off to provide a secure foundation. The top width of this portion of the eastern

arm will be 35 feet, and the bottom width resting in the chalk 45 feet, the whole of the blocks being bonded and joggled together, so that the work will be practically monolithic. It is arranged that the coping level of this pier shall correspond with that of the existing Admiralty Pier, being 10 feet above high water of spring tides the difference between the level of this portion of the work and that of the viaduct being met by an incline having an easy gradient of 1 in 40. On the seaward side there will be a parapet of 10 feet wide—the top forming a promenade 6 feet wide and a shelter parapet, like that on the Admiralty Pier, 3 feet 6 inches in width, supplied with railings, stairways and other necessary adjuncts. Above the granite-faced concrete blocks the work will be solid granite, the end of the arm being finished off by a circular head 55 feet in diameter, on which will stand a lighthouse built of the same substantial material—the blocks of the head being bonded, joggled and cramped together. Along the back of the solid work will be laid a protective apron consisting of two rows of concrete in bags (each weighing 14 tons), which will preserve the chalk foundation from the erosive action of the sea. This east arm of the harbour is to take a south-easterly direction until the curve is reached, when it will tend more to the south, the outer portion being south south-west.

The description given sketches shortly the plan proposed for the first portion of the scheme now in progress. It is intended in the future to extend the present Admiralty Pier a distance of 580 feet, forming, with the head of the East Pier just described, an opening to the new harbour 450 feet in width. This can be modified by carrying on the works further, which will doubtless be done in the way that experience may show to be desirable. The construction of the Admiralty Pier has already occupied thirty years, and cost over a million sterling. As soon as the works afford sufficient shelter within the harbour, the reclamation of a shallow water area five acres in extent, situate in front of the Lord Warden Hotel, will be proceeded with. Hereon two jetties will be constructed, each 400 feet in length and 100 feet wide. They will be furnished with capacious landing-stages, which will enable vessels arriving at the period of low water to discharge their passengers at a low level.

The total quantity of concrete to be used on the works will be 310,000 cubic yards. The granite used will equal 460,000 cubic feet, and the iron for the viaduct will weigh 3,000 tons. Mr. John Jackson has contracted to carry out part of this work, at a cost of 414,000*l.*, and has also undertaken to complete the same within six years. After this there remains

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to be completed the Admiralty Pier extension, the internal jetties, the sea wall and the reclamation of the shallow water area, five acres in extent.

THE DIFFICULTIES OF A FRENCH SURVEYOR.

THE country to which the human race owes the first step towards the establishment of a metrical system in perfect harmony with our universal numerical system is France. From what has been said regarding the provincial systems of Great Britain and Ireland, it will not appear surprising that France should at one time present a similar mass of confused and embarrassing weights and measures. The gradual growth of that country by the successive aggregation of its provinces, by treaty or conquest, from the most fertile and populous districts of Central Europe was highly favourable to the preservation of local peculiarities. Each newly added province usually retained many of its laws, customs and fiscal arrangements. It was often considered a privilege to retain what was bad as well as what was good, and thus each provincial system of weights and measures was scrupulously preserved. Thus it happened that, previously to the Revolution, commercial transactions between remote parts of the kingdom were nearly as embarrassing as with foreign countries.

The views developed by La Condamine (1748) had long rendered the question of uniformity of measures familiar in the scientific circles of France, but in 1791 the proposal of a new system began to be discussed not only among scientific men, but also among some of the people who suffered from the confused state of affairs in the provinces. In the spring of 1788 the matter occupied the serious consideration of the Constituent Assembly. In August of the same year the Constituent Assembly charged the Academy of Sciences with the determination of a system founded in nature and destined to permanently supersede the varied and jarring systems existing throughout the provinces of France. It was also proposed that the new system should be so framed as to render it acceptable to the tastes and applicable to the wants of the other civilised families of mankind. The Academy resolved, therefore, that its divisions should be connected according to the decimal scale, and that the units of surface, capacity and weight should all depend on the unit of length. To determine the absolute magnitude of this unit and to fix on a suitable standard for its comparison became a problem of fundamental importance. The commissioners appointed by the Academy to decide on

this question were Lagrange, Laplace, Borda, Monge and Condorcet. After discussing the relative merits of the invariable length which is known to be required for the exactness of a second's pendulum at any given latitude and of a unit taken from the dimensions of our planet, they decided on preferring the latter, as not involving the heterogeneous element of time, and being also necessarily of a more cosmopolitan character. The ten-millionth part of the arc of meridian comprised between the equator and the pole was therefore selected as the unit of linear measurement. It was assumed that as long as the earth continues in habitable conditions for the human race its dimensions cannot sensibly change, and that, consequently, if the national standards of length should through physical or political causes be lost or injured their true values could always be recovered by a direct re-measurement of the earth, or by a fresh determination of the length of the second's pendulum, the relation between which and the standard of length having been previously determined.

Although it was admitted that an estimate of the standard of length deduced from some previously executed measurements of the earth would be more than sufficiently exact for the ordinary purposes of commerce and the arts, it appeared to the French Academy better, both for the sake of science and for the philosophical character with which the new metrical system was to be invested, to make an entirely fresh re-measurement. The management of so important an undertaking was entrusted to a commission of the French Academy, of which Delambre and Mechain were the two astronomers more especially engaged in the geodesical operations. The arc selected for measurement is that extending between Dunkirk and Barcelona, of which the northern and by far the larger portion, extending from Dunkirk to Rodez, was to be superintended by Delambre, while his colleague undertook the management of the operations connected with the remainder. This unequal division of work arose from the presumed greater difficulty of the Spanish part of the arc, and the circumstance that the French portion had been already twice surveyed by different observers.

It was soon found, however, that the principal difficulties were not to be met with across the Pyrenees, but close to the walls of Paris. Mechain had scarcely commenced his journey towards the south, in the summer of 1792, when he was stopped by bands of armed citizens, and kept for a short time under arrest, until regularly liberated by authority. As he advanced, the obstacles to his progress gradually diminished, and he was

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able to commence his labours without any interference. In autumn he had completed the entire measurement of the angles of the several stations distributed across the Pyrenees and the north-east of Spain. The following winter was to be employed in astronomical determinations at the southern extremity of the arc.

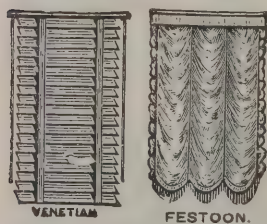
Delambre was less successful in France; his first difficulty arose from the want of such prominent and distinct objects as would suffice for marking his stations with precision when observed from distances so great as the intervals between these stations. When the angular distance between two objects, each distant from an observer from twenty to thirty miles, is to be ascertained with the minute accuracy required in a geodesical survey, it is indispensable that these objects should be well defined in outline and clearly visible. Such objects as towers and steeples are well adapted for this purpose, but they are not always so situated as to meet the requirements of the system of triangulation. On this account artificial signals have to be frequently constructed, usually pyramidal structures of wood or stone. By the aid of powerful lamps, night observations are also capable of being made with very satisfactory results. Under the existing circumstances, night signals were attended with manifest danger, and Delambre and his associates appear never to have used them except on one occasion close to Paris, and then, perhaps fortunately for themselves, in a most imperfect manner. Only a few nights before this attempt their attention had been excited by a lurid glow towards the south. This arose from burning houses in the Place du Carrousel, for that happened to be the night of August 10, 1792.

Although furnished with passports and other documents emanating from the Government, the astronomers found themselves stopped by serious difficulties arising from the disturbed condition of society. The construction of signals was sometimes prevented by the people; the observers were frequently placed under armed surveillance by the district authorities. Much embarrassed by these obstacles, Delambre despatched one of his assistants to Paris to obtain fresh passports, which were rendered the more necessary from changes that had taken place in the supreme power. He prudently abstained from presenting himself, as he foresaw that he would be told to postpone his labours to an epoch of greater tranquillity, and that with such a postponement an indefinite period might elapse before the undertaking could be again resumed. In the meanwhile he caused his passports to be *vised* at St. Denis, where he happened to have arrived, and also took the pre-

caution of obtaining a certificate from the district authorities. But these precautions availed little, for in half an hour afterwards the astronomer and his companions were arrested at Epinay. The instruments were regarded with particular suspicion, as perhaps dangerous counter-revolutionary engines; just as, a few centuries before, the same people might have looked upon them as apparatus connected with the mysteries of the black art. Delambre was required to display the instruments on the ground, and to explain their use. As may be readily supposed, not one among such a cultivated audience could understand his explanations. He tried vainly to excite the interest of two surveyors who happened to have got into the crowd, by showing the close affinity between his operations and the labours of their profession. These men would not compromise themselves by saying anything; they dared not oppose themselves to the tone which was now so prevalent among the multitude. After a discussion of three hours, the astronomers were conducted back to St. Denis under armed escort. The open place before the venerable mausoleum of the kings of France was filled with groups of Republican volunteers waiting to be armed before marching to defend the frontier. The prisoners had to pass through this motley crowd; their carriages were explored; a heap of sealed letters addressed to the authorities of the departments in which the geodesical operations were to be carried on were discovered. The letters were speedily opened and publicly read, when they were found to be only circulars, in which the Committee of Public Instruction of the National Assembly recommended the bearers to the good offices of the official personages to whom they were addressed. When the curiosity of the crowd had been satisfied about the letters, they next turned to the instruments. These were quickly displayed upon the open part of the square, and Delambre was once more compelled to attempt a lecture on geodesy under circumstances at once terrible and ludicrous. The day was rapidly waning; the last rays of sunset had long since tinged the summit of the abbey, and objects close to the ground were no longer distinctly visible in the growing dusk of twilight. The first ranks of the numerous audience saw little and heard without understanding; the more remote heard less and saw nothing. Impatient murmurs arose; cries began to be heard suggesting the usual expeditious means employed at the time for cutting short all doubts. The president of the district had the presence of mind to suggest the postponement of further inquiry until the suspicious-looking instruments could be examined

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with the advantage of broad daylight, and, affecting a tone of severity, he ordered these and all other articles belonging to the astronomers to be placed under seal. Delambre immediately addressed a letter to the President of the National Assembly entreating some specific measure for the protection of himself and his associates. This was done without delay, so that he was able to emerge after the lapse of three days from a place of concealment where he had been obliged to remain since the adventures which had threatened to so abruptly terminate his scientific career.

For some time after these events natural obstacles alone opposed themselves to the progress of the geodesical operations. During the spring of 1793 fresh difficulties arose from the necessity of constantly procuring new passports, and of exhibiting them almost unceasingly at the demand of every local authority. About this period also, the triangulation having been pushed to the northern extremity of the arc, the observers found themselves close to the scene of war, but by changing a few intended stations they were able to avoid the awkwardness of carrying on their scientific labours in the presence of two hostile armies. The work had now advanced to the south of Paris; and as the triangulation approached the Loire it was found essential to construct on the hill of Chatillon, between Pithiviers and Orleans, a signal of considerable dimensions. As this structure was to serve as a kind of geodesical observatory, it had to be so made as to present not only a wide surface to the autumnal and wintry gales that now began to rage, but also a very conspicuous appearance among surrounding objects. The erection thus became a fruitful source of the most absurd rumours, and had to support, along with the fury of the elements, the equally blind attacks of many a village orator.

Hitherto the obstacles encountered by the little band of scientific observers had been generally such as would naturally arise at any period, and in any country, from the combined influence of popular ignorance with the excitement consequent on a disturbed state of society. But at Chatillon they became acquainted with a fact which for a time put an end to their labours. The Academy of Sciences had been abolished six months previously; but the Commission for Weights and Measures was retained by a special decree. The party now in power was favourable to the metrical system, but had little sympathy with the fundamental operations required for its establishment. A provisional standard of length deduced from former measurements was apparently deemed good enough for

definite adoption. The commissioners of the metrical system received hints that it would be desirable to rapidly terminate their labours, and that some of them would very soon be dispensed from further occupation. Not long afterwards Delambre received an official communication, enclosing a decree ordering his suspension, in company with Lavoisier, Laplace, Coulomb and others on account of their doubtful republicanism.

The suspension of the geodesical operations did not continue much beyond the period at which the power of those who commanded that suspension had passed away with themselves; and in the spring of 1794 arrangements were made for resuming the work nearly on the same footing as before. In the meantime, Mechain had not only to contend with physical obstacles among the Pyrenees, but also with difficulties arising from the war which had broken out with Spain. The signals marking his stations were frequently destroyed, the instruments, and even the observers, were sometimes imperilled by the fury of those ascending and descending gusts of wind which are so prevalent among the deep gorges of the mountains. The dangers arising from parties of guerillas were fortunately much diminished by the liberality of the Spanish authorities, who for a considerable time invariably granted the utmost freedom of action to the French astronomers. At length it appeared to the general stationed on the frontier that the information acquired by Mechain and his companions respecting the country traversed during the operations might prove prejudicial to the interests of Spain; and accordingly the astronomer was ordered not to quit the country.

In the autumn of 1794 Delambre recommenced his labours in the neighbourhood of the Loire, but his progress was very slow, from the necessity of defraying all expenses with the now greatly depreciated assignats. After an absence of several months from this quarter, in order to execute the tedious and difficult operation of determining with precision the latitude of Dunkirk, he proceeded with the work to the south of Bourges among the central districts of France. Some trouble and much delay arose in this part of the country, owing to the manner in which church steeples, that would have afforded excellent signals, had been stunted of their proportions by revolutionary fanaticism. One representative of the people had boasted, in a letter to the National Assembly, that he had levelled those steeples which so proudly reared themselves above the humble dwellings of the "sans-culottes." Delambre witnessed everywhere that the humble "sans-culottes" regretted very much the loss of their steeples; and on one

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occasion, having had to supply a church spire, which his triangulations rendered indispensable, its subsequent removal was prevented by the determined opposition of the entire parish. At another station, having covered with white canvas, to render it distinct, one side of a pyramid of planks which occupied the place of a levelled church spire, an alarm arose among the people at the sight of a colour in their eyes so significant of counter-revolution; but a complete remedy was soon provided, by attaching to one side of the white canvas a strip of red cloth, and to the other side a strip of blue. This signal was always respected, while another, only a few leagues to the south, was in constant danger. The very day on which it was erected a violent storm visited the neighbourhood, and the mountain torrents swept an immense volume of earth and gravel into the streets of the adjacent town, where apprehensions were at the same time entertained for the safety of a bridge across the river Dordogne. The signal was blamed for these disasters, and it had also to bear the imputation of causing the heavy rains which for two months suspended agricultural labours among the mountains. Several attempts were made to cause its removal; but, fortunately, its position was almost inaccessible. All the triangulation of the south having been finished, nothing remained but the measurement of the two bases at Melun and Perpignan. These measurements were terminated without any difficulty except such as are natural in labours requiring so many precautions, and in which the physical observer is compelled to employ every resource that science can bring to his aid.

Invitations had been issued by the French Government to neutral and allied countries, in which they were requested to send deputies to Paris, who should assist, along with the Commissioners of the Academy of Sciences, in the final settlement of a metrical system adapted to the usage of all nations. Such deputies had been accordingly despatched from the Netherlands, Denmark, Spain, Switzerland, and several states of Italy. The entire body of French and foreign commissioners having assembled about the beginning of the year 1798, divided itself into sub-committees.

After long investigation, it appeared that the ten-millionth part of an arc extending from the pole to the equator was 443'3255 lines of the old measure, and a bar of this length was accordingly adopted as the mètre. When the measured arc was afterwards prolonged to Formentera, this value was altered by less than its sixty-thousandth part. The length afterwards

definitively adopted is 443'296 lines; so that the mètre is equivalent to a little more than 39 $\frac{1}{2}$ English inches. The standards of surface and capacity, as may be readily conceived, were deduced from multiples or submultiples of the linear standard. Thus a square 10 mètres long was designated as the standard of surface for land measure; in other words, the value of this unit is 100 square mètres. The standard of capacity for liquids was determined by finding a cylindrical volume equal to a cube whose edges are formed by tenths of the linear standard. This is the litre, a measure somewhat smaller in capacity than one of our imperial quarts.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 1406. Benjamin William Peel, for "An improved draught regulator for fireplaces."
- 1421. Charles Edward Percy Gabriel, for "Improvements in a rack pulley."
- 1464. James Henderson, for "An improved surveying instrument."
- 1491. Thomas Warner, for "A combination extension fender and fireguard."
- 1560. Rudolf Hagen, for "Improvements in faucets."
- 1629. Samuel Achurch, for "An improved window fastener."
- 1645. James Sayburn Wilson and John Thomas Wilson, for "Improvements in or relating to chimney and other cowl."
- 1707. Charles Smith and John Hesketh Smith, for "Improvements in or relating to roofs for buildings."
- 1724. Ernest Charles Lea, for "Improvements in door furniture."
- 1809. Alexander Westwood and William McPherson Westwood, for "Improvements in fanlight, skylight and other like window fittings."

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Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications

COMPETITION OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200*l.*, 150*l.* and 100*l.* Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

ABERAMAN.—Feb. 22.—For Building the Aman Infant School. Mr. John Thomas, Town Hall, Aberdare.

ABERDEEN.—Feb. 23.—For Additions, &c., to Stables and Vansheds, Millbank. Mr. Alexander Mavor, Architect, 211 Union Street, Aberdeen.

ABERDOVEY.—Feb. 21.—For Building Presbyterian Chapel. Mr. Richard Davies, Architect, Bangor.

ANDOVER.—Feb. 22.—For Alterations to Carriage Shed at Infectious Hospital. Mr. A. Purkess, Borough Surveyor, Town Hall, Andover.

ASPATRIA.—Feb. 21.—For Building Stable, Coachhouse, Billiard Room, &c., at Half Moon Hotel. Messrs. Moffat & Bentley, Architects, Whitehaven.

BIDEFORD.—Feb. 24.—For Building Stables and Stores. Mr. R. T. Hookway, Architect, Bideford.

BISHOP'S CASTLE.—Feb. 20.—For Construction of Concrete Service Reservoir and Supplying Iron Water Mains. Mr. R. L. Bamford, Surveyor, 138 Widemarsh Street, Hereford.

BOXMOOR.—Feb. 27.—For Extension of Church. Mr. T. Foster Woodman, Architect, St. Peter's, St. Albans.

BRADFORD.—Feb. 22.—For Building Six Houses. Mr. A. Sharp, Architect, Albany Buildings, Market Street, Bradford.

BURLEY-IN-WHARFEDALE.—For Building Pair of Semi-Detached Houses. Messrs. Isitt & Adkin, Architects, Queen Anne Chambers, Bradford.

BURNLEY.—Feb. 22.—For Building Greengrocer's Warehouse at Market Hall. Mr. F. S. Button, Borough Surveyor, Town Hall, Burnley.

BURTON-ON-TRENT.—Feb. 25.—For Buildings for Electric Light Works. Mr. F. L. Ramsden, Engineer, Gasworks, Burton-on-Trent.

BURY.—Feb. 20.—For Additions to Elton Fold Mills. Mr. Thomas Wilde, Architect, 12 Cook Street, Bury.

CARLINGHOW.—Feb. 17.—For Building Dwelling House. Messrs. P. Spencer & Son, Architects, Batley Carr.

CARLISLE.—Feb. 27.—For Erection of Buildings forming Castle Street Entrance to Tullie House. Mr. W. Howard Smith, City Surveyor, 36 Fisher Street, Carlisle.

CARLOW.—Feb. 23.—For Additions, &c., to the Work-

house. Mr. John G. Glover, Clerk to the Guardians, Workhouse, Carlow.

CHRISTCHURCH.—Feb. 20.—For Iron Buildings for Temporary Sleeping Wards at the Workhouse. Mr. A. Druitt, Clerk to the Guardians.

CLECKHEATON.—March 6.—For Building Residence. Messrs. Mawson & Hudson, Architects, Exchange Buildings, Bradford.

CORK.—For Building Villa at Rushbrook. Mr. James F. M'Mullen, 38 South Mall, Cork.

DAGENHAM.—Feb. 23.—For Enlargement of Board School. Messrs. Wigg, Oliver & Hudson, Architects, 80 Leman Street, Whitechapel.

DARTMOUTH.—Feb. 18.—For Excavating Trenches, Supplying, &c., Cast-iron Pipes, Hydrants, Valves, &c., Constructing Service Reservoirs and Filters. Mr. T. O. Veale, Borough Surveyor, Dartmouth.

DERBY.—Feb. 27.—For Building Pavilion and Nurses' Annexe to Infectious Diseases Hospital. Mr. R. J. Harrison, Borough Surveyor.

DONCASTER.—Feb. 21.—For Showyard Fittings for Agricultural Show. The Secretary, 9 Market Place, Doncaster.

DORKING.—Feb. 20.—For Constructing Sludge Pit, Filter Beds, &c., and Supplying and Fixing Sewage Liming Machines, Stockport Gas Engine, and Pneumatic Ejectors. Mr. J. Lemon, 9 Victoria Street, Westminster.

ERITH.—Feb. 20.—For Building Cottages with Wards at Rear for Infectious Diseases Hospital. Mr. F. Parish, Clerk to the Local Board, High Street, Erith.

FINSBURY PARK.—Feb. 21.—For Building Chrysanthemum House. The Architect to the County Council, Spring Gardens, S.W.

FLEETWOOD.—Feb. 20.—For Alterations to Free Library. Mr. T. Whitaker, Architect, Poulton Road, Fleetwood.

HOMERTON.—Feb. 22.—For Alterations to Mortuary and Works at Eastern Fever Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

HUDDERSFIELD.—Feb. 23.—For Building Vagrant Wards, Sergeant's House, Boundary Walls, &c. Messrs. John Kirk & Sons, Architects, Huddersfield.

JARROW.—March 1.—For Building Board School and House. Mr. G. Mason, 4 Grange Road West, Jarrow.

LEEDS.—Feb. 28.—For Building Lecture Hall. Mr. G. F. Danby, Architect, 46 Great George Street, Leeds.

LITTLEHAMPTON.—March 2.—For Building Town Offices. Mr. H. Howard, Surveyor, 1 Church Street, Littlehampton.

LLANGOLLEN.—Feb. 18.—For Additions to Stores. Mr. H. L. Tacon, 4 Berwyn Street, Llangollen.

MORTLAKE.—Feb. 27.—For Supplying Broken Granite, Flints, Gravel, &c., and for Paviers', Masons', Bricklayers' and Jobbing Works. Mr. H. Richards, Murthly Villa, St. Leonard's Mortlake, S.W.

MOUNT PLEASANT.—Feb. 20.—For Second Portion of Parcel Post Office. H.M. Office of Works, 12 Whitehall Place, S.W.

NELSON.—Feb. 27.—For Building Free Library, Technical School, &c. Messrs. Holtom & Fox, Architects, Dewsbury.

PLASNET.—Feb. 27.—For Building Board School. Mr. Robert L. Curtis, Surveyor, 120 London Wall, E.C.

PONTYPOOL.—Feb. 27.—For Building Bank Premises. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

PORTSMOUTH.—Feb. 21.—For Construction, Alterations and Reparation of Sewers, for the Urban Sanitary Authority. Mr. Alexander Heilard, Town Clerk.

ROSCOMMON.—Feb. 18.—For Supplying and Fixing Three Porcelain Enamelled Baths. Mr. J. J. Shiel, Secretary, Roscommon County Infirmary.

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ROTHIEMAY.—Feb. 25.—For Building Mansion. Messrs. Ross & Macbeth, Surveyors, Queen's Gate Chambers, Inverness.

SALFORD.—Feb. 23.—For Building Model Lodging-house. The Borough Engineer. Also for Retort-house, Coal Store, &c. The Gas Engineer.

SALISBURY.—Feb. 23.—For Additions to Cottage at Waterworks. Mr. J. C. Bothams, City Surveyor, Municipal Offices, Salisbury.

SEDGLEY.—Feb. 18.—For Additions to Board Schools. Mr. A. P. Brevitt, Architect, Red Lion Street, Wolverhampton.

SPALDING.—Feb. 25.—For Building Infants' School. Plans at the Parsonage.

STOCKWELL.—March 2.—For Additions, &c., South-Western Fever Hospital. Mr. T. W. Aldwinckle, Architect, 1 Victoria Street, Westminster.

WALTHAMSTOW.—Feb. 17.—For Building Board Schools, Forest Road. Mr. W. A. Longmore, Architect, 7 Great Alie Street, Whitechapel.

WEST HAM.—Feb. 27.—For Erecting Two Organs. Mr. Lewis Angell, Town Hall, Stratford, E.

TENDERS.

ASHBY-DE-LA-ZOUCH.

For Building Stables, Sheds, &c., for the Local Board, Ashby-de-la-Zouch.

Buck	£274	9	0
Slater	271	0	0
Pike	264	10	0
Orton, Packington	260	0	0
Orton & Son, Ashby	248	0	0
CANNER (accepted)	229	3	0

ABERDARE.

For Building Business Premises, High Street, Aberdare. Mr. C. H. ELFORD, Architect, Cardiff.

M. Thomas, Aberdare	£1,157	0	0
D. Davies, Trecynon, Aberdare	1,037	0	0
J. MORGAN, Aberdare (accepted)	1,037	0	0
D. Jenkins, Aberdare	965	0	0

ABERDARE—continued.

For Alterations to Trinity Chapel, Aberdare. Mr. C. H. ELFORD, Architect.

M. Thomas, Aberdare	£567	10	0
W. LESSAMAN, Aberdare (accepted)	548	0	0

BALLYNOE.

For Providing Water-Supply to Village of Ballynoe, for the Guardians of Fermoy Union.

E. W. Finn, Charleville	£311	5	0
T. O'Mahony	292	2	0
D. Creedon	250	0	0
M. O'Connell, Carrigowhill	239	0	0
D. Hayes	220	0	0
J. DUNN & SONS (accepted)	218	14	0

BURNLEY.

For Entrance Lodge, New Park, Ridge End, Burnley. Mr. F. S. BUTTON, Assoc. M. Inst. C.E., Borough Surveyor.

Quantities by the Borough Surveyor.			
Smith Bros., Burnley, mason	£325	0	0
R. Simpson, Burnley, carpenter and joiner	110	7	0
J. Smith, Burnley, plumber and glazier	41	13	2
Whittaker & Schofield, Burnley, slater	39	13	0
C. Smith, Burnley, plasterer and painter	24	16	9

CHISWICK.

For Additions and Decorative Repairs, &c., to House at the Corner of Bath Road and Rupert Road, Bedford Park, Chiswick, for Mr. Harry Nicholls. Mr. WALTER J. EBBETTS, F.R.I.B.A., Architect, Savoy House, 115 Strand, W.C.

H. Hanks	£815	0	0
C. F. Kearley	795	0	0
J. Bryant	780	0	0
R. A. YERBURY (accepted)	720	0	0

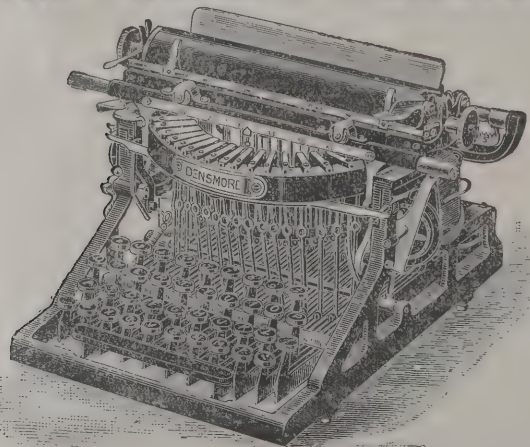
DARTFORD.

For Painting and other Works at the Gore Farm Hospital, near Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

W. Tuffee	£1,678	0	0
G. Foxley	1,390	0	0
W. F. Hadlow	1,218	0	0
Akers & Co.	1,127	0	0
Batchelor & Co.	1,114	0	0
LILLY & LILLY, Pall Mall East (accepted)	987	0	0

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G. Lewis & Sons, Dover	£250	0	0
W. Bromley, Dover	217	5	0
J. J. HALL, Dover (accepted)	183	0	0

EBBW VALE.

For Building Dwelling-house, with Boundary Walls, &c., at Eureka Place, Ebbw Vale.

D. Thomas, Ebbw Vale	£355	0	0
Matthews, Ebbw Vale	330	0	0
S. DAVIES, Ebbw Vale (accepted)	325	0	0

Note.—Painting not included.

ELLAND.

For Building Fire Brigade Station, Elland.

Accepted Tenders.

P. Gledhill & Sons, mason	£1,000	0	0
F. Lomas & Son, joiner	273	12	9
J. Smithies, slater	122	10	0
J. Aspinall, plumber	52	16	6
W. Furness, painter	18	14	0

GREENWICH.

For Paving Footway of Park Villas and Rutland Gardens, Greenwich.

A. T. Catley, Lloyd Square	£487	0	0
Woodham, Fry & Fry, Greenwich	460	0	0
MOWLEM & CO, Westminster (accepted)	437	0	0

HATFIELD.

For Building Bailiff's House at Asturch Manor, Hatfield, for Mr. J. Lloyd. Mr. T. FOSTER WOODWARD, F.S.I., Surveyor, St. Albans.

Sparrow, Harpenden	£498	10	0
Redhouse, Baldock	476	0	0
Savage, St. Albans	456	0	0
Norton, Essenden	439	12	0
SHARPE, Amptill*	432	10	0

* Accepted, with modifications.

KING'S LYNN.

For Building Technical School, King's Lynn. Mr. E. J. SILCOCK, Assoc.M.Inst.C.E., Architect. Quantities by Mr. D. CLACK.

R. Dye, Lynn	£3,020	0	0
W. Collison, Lynn	3,020	0	0
Girling & Co., Wisbech	2,985	0	0
R. W. Fayen, Lynn	2,907	5	6
W. Bardell, Lynn	2,880	0	0
W. H. Brown, Lynn	2,793	0	0
Jarvis & Melton, Lynn	2,489	0	0

LONDON.

For Billiard Room, &c., Forest Lodge, Tulse Hill, S.W., for Mr. G. Adney Payne. Mr. ALFRED PARNACOTT, Surveyor, 93 York Road, Westminster Bridge Road.

Peacock Bros. £455 0 0

Tables and Fittings.

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For New W.C.s at Board School, Brunswick Road, Poplar, for the Girls' and Infants' Departments.

Peattie & Axtell	£870	0	0
McCormick & Sons	664	0	0
D. Gibb & Co.	655	0	0
W. Gregar & Son	629	0	0
J. T. Robey	617	0	0
W. Neil	600	18	3
A. D. Morgan	551	0	0

For New W.C.s for Board School, Chicksand Street, White chapel, for the Infants' Department.

D. Gibb & Co.	£473	0	0
Staines & Son	347	0	0
J. N. Calnan & Co.	240	0	0
J. T. Robey	230	0	0

For Extension of the Holloway to Hackney Storm Relief Sewer to Sandringham Road, for the County Council.

T. Adams	£16,414	4	3
J. Price	14,645	14	9
Iles	13,353	0	0
J. Dickson	12,254	17	6
J. Mowlem & Co.	11,458	0	0

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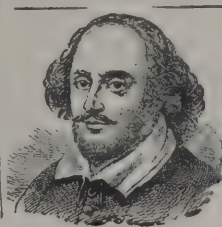
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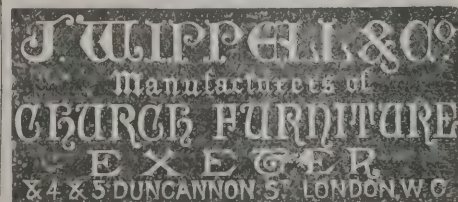
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 Farmer & Gregory, Plumstead 420 0 0
 Rackham & Bentham, Plumstead 344 0 0
 D. BREWER, Plumstead (accepted) 305 0 0

For Works of Repair, Painting, Cleaning, &c, at Warehouse, Manchester Buildings, Golden Lane, for the Vestry of St. Luke, Middlesex.

T. White & Son, Bow £865 0 0
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 Sheffield Bros., Stoke Newington 750 0 0
 Snewin Bros., Upper Clapton 747 0 0
 W. A. Prior, Kilburn 698 0 0
 G. Wade, Chelsea 695 0 0
 G. Larnier, Old Street 687 0 0
 W. & E. Mills, Westcombe Park 675 0 0
 Gordham & Hazell, Islington 653 0 0
 F. C. Stokes & Co, Walworth 650 0 0
 Little & Senecal, Bishopsgate 639 0 0
 W. Akers, South Norwood 620 0 0
 W. Scott, Chelsea 588 0 0
 W. Irwin, City Road 581 0 0
 W. Furness, West Croydon 568 0 0
 W. Brown, Shepherd's Bush 560 0 0
 J. J. Richards, Clapham Junction 523 0 0
 G. W. Stewart & Co., Walworth 395 13 4

For Various Alterations and Decorative Works at Hyde Park House, Albert Gate, for Captain H. S. Naylor-Leyland, M.P., Colchester. Messrs. YOUNG & SPENCER, Architects, 17 Coleman Street, E.C.

Woodward & Co., constructional work.
 Howard & Sons, general decorative work.
 Trollope & Sons, other decorative work.
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 Adams & Co., hot water and kitchen fittings.
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 Dent & Hellyer, sanitary work.
 Newall & Co, lightning conductors.

LONDON—continued.

For Alterations at 12A George Street, Hanover Square, W., for Messrs. Kirkman & Son (Contract No. 1). Mr. JOHN WALDRAM, C.E., Surveyor, 13 Buckingham Street, W.C. Quantities supplied by Mr. P. J. WALDRAM.

Foxley £2,677 0 0
 W. Johnson & Co, Limited. 2,596 0 0
 Bywaters & Sons 2,435 0 0
 T. Stevens 2,387 0 0
 Nicholson 2,364 0 0
 Grover & Son 2,300 0 0
 NIGHTINGALE (accepted) 2,218 0 0

For Electric Wiring at Lindfield Gardens, South Hampstead, N.W., for Mr. Harvey Samuels. Messrs. YOUNG & SPENCER, Architects, 17 Coleman Street, E.C.
 T. J. DIGBY (accepted).

For Electric Wiring and Fittings to 42 Gresham Street, for Messrs. Stubbs & Co. Messrs. YOUNG & SPENCER, Architects, 17 Coleman Street, E.C.

LAING, WHARTON & DOWN (accepted).
 For Alterations and Decorative Work at 21 York Terrace, Regent's Park, N.W., for Mr. L. McKenna. Messrs. YOUNG & SPENCER, Architects, 17 Coleman Street, E.C.
 F. G. Davis, general constructional and decorative work.
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WAMBROOK.

For Works in Connection with Restoration of Parish Church, Wambrook. Mr. G. H. GORDON, Architect, 3 Prince's Mansions, Victoria Street, Westminster.

H. Reed, Exeter	£1,076	10	0
A. Kite, Salisbury	914	0	0
C. & A. Haun, Beaminster	798	0	0
A. Poole, Ilminster	795	0	0
A. HILL, Chard (accepted)	660	0	0

WEST BROMWICH.

For Supply of Boiler to Public Baths. Mr. J. T. EAYRS, Borough Surveyor, West Bromwich.

D. Adamson, Manchester	£158	0	0
Musgrave & Son, Bolton	146	0	0
R. Dawson, Limited, Stalybridge	133	0	0
Gimson & Co., Leicester	125	0	0
The Cradley Boiler Company, Cradley	111	10	0
E. Danks, Oldbury	100	0	0
H. & T. DANKS, Netherton (accepted)	92	0	0
T. Piggot & Son, Birmingham (withdrawn)	58	0	0

VARIETIES.

THE Hull Dock Company have, at an extraordinary general meeting, unanimously resolved to agree to the proposed sale of the Hull Docks Estate to the North-Eastern Railway Company for 3,000,000.

THE ground and steps and the approach at the west end of the parish church, Kettering, are now under renovation, and when these works are accomplished, and the new organ erected, the restoration will be practically complete.

THE borough surveyor of Rhyl, Mr. Robert Hughes, has made an examination, in company with Mr. W. Shone, of Chester, of the submerged forest on the shore at Rhyl, and has come to the conclusion that the discovery is really the remains of an ancient forest extending back probably several centuries.

THE Local Government Board have sanctioned the loan of 2,000*l.* for the purpose of carrying out the sewage scheme at Henley-in-Arden.

AT the weekly meeting of the Mersey Docks and Harbour Board the Marine Committee recommended the filling up of

the embayment in the Liverpool ferry goods stage, at an estimated cost of 9,000*l.*, which was agreed to.

THE Inman Line will shortly take up its headquarters at Southampton. Messrs. Lucas & Aird are pushing forward the new graving dock they are constructing for the South-Western Company, at a cost of over a quarter of a million. More than four hundred men are at work, and over six thousand yards of chalk are being daily utilised in building the embankment. The work will probably take three years to complete, and will then be the largest graving dock in the world.

IN the open competition for designs for laying out eleven acres of the Fields Estate, Newport, Mon., for building purposes, eight sets of plans were received. Messrs. Veall & Sant, architects, Cardiff, the professional assessors, awarded a premium of 25*l.* to the design marked "Fairfield C," the author of which is Mr. Alfred Swash, architect, Newport.

THE annual dinner of the Cardiff Architects' Society was held in the Park Hotel, Cardiff, Mr. Vaughan in the chair, and supported by a large and representative professional gathering including Messrs. Forster Browne, F. Thompson, E. W. M. Corbett, E. H. Bruton, George Thomas, J. Coates Carter (hon. sec.), H. Snell, A. Swash, E. H. Fawcner, Grocock, Moses, Wilson, Rooney, D. Morgan, E. J. Williams, and Cornish. The loyal toasts having been duly honoured, Mr. Forster Browne proposed "The Art of Architecture."

THE *Reading Mercury* says:—The Berks Archæological and Architectural Society's Quarterly Journal (which can now look back on four years of existence), continues in its January number the selections from early Berkshire wills, and also its account of "Swallowfield and its Owners," from the pen of Lady Russell. Mr. Nathaniel Hone gives a translation of a curious "Inquisition 'de probatione ætatis'" or "proof of age" in the case of Elizabeth, daughter and heiress of John de Shottesbrok, 1296-97, the evidence of "twelve lawful men and true" being taken to prove that she is of lawful age to come into her property.

AT the meeting of the Hyde (Lancashire) Town Council, the Town Clerk reported that sanction to a loan of 10,000*l.* for the purpose of constructing a cemetery had been granted.

AT the meeting of the Shrewsbury Town Council it was reported that the Local Government Board had sanctioned the borrowing of 7,000*l.* for the erection of a police station.

THE annual dinner of the Clerks of Works Association of Great Britain, of which Mr. J. Oldrid Scott is hon. treasurer,

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took place on Monday, the 13th inst., at the Holborn Restaurant. Mr. J. Blashill, architect, presided, Mr. H. O. Cresswell, president of the Architectural Association, being present among others. After the usual toasts that of the Clerks of Works Association was duly honoured and responded to by Mr. W. R. Cubitt, president. Responding for the Carpenters' Company, Mr. Banister Fletcher gave a description of the efforts of the company to promote technical education, speaking especially of the work of the company in conjunction with University College, the Council of King's College, the Society of Wood Carving—in connection with which they have established trade and amateur schools—and the Corporation of West Ham.

ELECTRICAL.

THE London County Council have adopted a recommendation of their Parliamentary Committee, and agreed that 5,000*l.* extra expenditure be authorised in the Bill which provides for lighting the Victoria Embankment and Gardens and Westminster and Waterloo Bridges.

At the meeting of the Dewsbury Town Council a discussion took place in respect to a recommendation of the Gas and Lighting Committee to adopt the site of the old gasworks for a central station for electric lighting. Another site was mentioned, near Webster Hill, but ultimately the recommendation of the committee was adopted.

BUILDING AND BUILDERS.

At Prestonpans a public meeting of ratepayers, called by the Chief Magistrate, has just been held to consider an offer by the local Institute Committee of nearly 1,000*l.* and a free site for the erection of a town hall. A plebiscite of the ratepayers will be taken forthwith.

THE *Scotsman* says:—The briskness in the building trade in Glasgow shows no sign of abatement. At a sitting at the Dean of Guild Court yesterday eleven "linings" were granted for the erection or alteration of property in the city. Mrs. Ferguson, Inverleith Row, Edinburgh, received the necessary permission to alter and add to property at 7 Ferguson Street, and Paterson's Chemical Manufacturing Company, Limited, to add to their works at Lochburn.

TENDERS are being taken in for building the Castle Street entrance to Tullie House, Carlisle, according to revised plans.

At the annual meeting of the Victoria Dental Hospital, Manchester, held in the Town Hall, Dr. Ward, principal of Owens College, made an earnest appeal for funds for the erection and equipment of a new building. A sum of 10,000*l.* is needed.

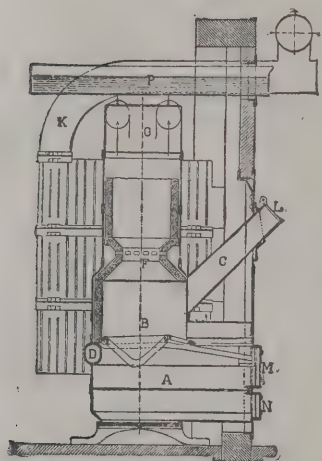
AN inquiry has been held by Mr. Arnold Taylor on behalf of the Local Government Board into the application of the Croydon County Council for permission to borrow 20,000*l.* for various purposes connected with the proposed new municipal buildings. When the plans were prepared, it was estimated that the structure would cost 70,000*l.*, and it became necessary to apply for another 35,000*l.* Since the estimate was made, however, it had been ascertained that the building would really cost 78,374*l.* A part of the excess could be accounted for by the cost of electric wiring, heating, &c. The inspector remarked that the custom of estimating the cost of a building per cubical foot, which was so much in vogue, was a very untrustworthy one.

SKETCH plans by Mr. Simpson, architect, of the infectious diseases hospital proposed to be erected for the burgh of Leith, having been generally approved by the sub-committee of the Town Council, are now being exhibited in the Council Chamber. The estimate of the cost of the construction of the hospital, according to the plans, is as follows:—Wards, mortuary, stable, lodge, administrative block, washing-house, laundry, disinfecting-house, discharging block and other buildings, 17,993*l.* 18*s.* 1*d.*, but adding for contingencies at 7½ per cent., 1,349*l.* 10*s.* 10*d.*, the cost is brought to 19,343*l.* 8*s.* 11*d.*; enclosure and other walls, fences, gates, covered ways, ambulance drive, &c., 1,676*l.* 17*s.* 2*d.*; furnishings, &c., 3,300*l.* 0*s.* 6*d.*; and contingencies at 7½ per cent., 373*l.* 5*s.* 3*d.*—making the total estimated cost 24,693*l.* 11*s.* 4*d.* This estimate is exclusive of the cost of a main sewer and laying out the grounds.

It is proposed to make a start during the coming spring with the new church of St. Mary's, for Kettering, the funds for which have been given by an anonymous donor. Plans and specifications have been agreed to.

A PARSONAGE-HOUSE is to be erected in connection with St. Peter's parish, Farnworth, near Bolton, at an outlay of 1,335*l.*

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situated No. 34 Dover Street, Piccadilly, and having a frontage to Berkeley Street, has been purchased by the Baths Club, Limited, a company of which Mr. Herbert Gladstone is the chairman. The object of the purchasers is to erect a clubhouse, which, besides being an ordinary social and residential club, will also combine the advantages of hot and cold baths, a large swimming bath, Russian and other vapour baths, and one of the finest Turkish baths in the metropolis. The architects are Messrs. Young & Spence, of 17 Coleman Street, E.C., and Mr. E. H. Bouchier, F.R.I.B.A., of 32 St. George's Street, Westminster, acting as consulting architect.

THE death of Mr. G. H. Cox, the architect for the Aston Technical School, together with the failure of the builder, has placed the Aston Technical School Committee in a dilemma. A meeting was convened, at which the present state of affairs was discussed, and it was decided to enter into an agreement with the guarantors for the completion of the building, the Building Committee being authorised to appoint another architect to superintend the work.

PLANS for the construction of the new post office and inland revenue office at Nottingham on the site in Queen Street, recently purchased, have now been completed by Mr. Henry Tanner, architect to the Post Office, and Mr. Leverton, surveyor to the Board of Works. The total cost is not to exceed 50,000/.

The nave of Swansea parish church is to be rebuilt at an outlay of 10,000/., against which the sum of 3,500/., has been promised by local subscribers.

THE Leeds School Board have decided to enlarge the Rodley School. The mixed school will in future be used as an infant school, with accommodation for 168, and the present infant school, to which three new classrooms will be added, will be used as a mixed school, with accommodation for 240, or a total of 408.

THE Lunatic Asylum Committee of the Middlesbrough Corporation have recommended the Corporation to accept Mr. J. S. Pennyman's offer of a site of about 76 acres, at 100/., per acre, at White House Farm, North Ormesby, for the erection of a new asylum for Middlesbrough.

THE Mayor of Hull gave a luncheon to the deputation to inquire into the principle of erecting workmen's dwellings in Hull, the Leeds back-to-back system not prevailing in the structure of houses for the working-classes in the port. After luncheon the party proceeded in conveyances to various parts

of the town, and the fullest information was given to the visitors on the subject matter of their inquiry.

TRADE NOTES.

At the annual meeting of the Association of Master Painters in Scotland held in the Royal Hotel, Edinburgh, the gathering was a large and representative one. Mr. John White, Aberdeen, retiring president of the Association, occupied the chair. From the report of the committee, it appeared that the Association was in a flourishing condition. The report also stated that harmony existed between the employers and employed, with the exception of the case of Greenock, where there was a strike in consequence of a proposal by the masters to reduce the standard rate of wages. Mr. Macfarlane, the president elect, in the course of an address controverted the recent statement made by Sir George Reid that "the Lowland Scot is utterly destitute of artistic feeling, but wherever the Celtic element comes in there you get art, eloquence and music."

THE authorities of the Regent Street Polytechnic, London, have hit upon an ingenious plan with a view to mitigating the difficulty experienced in choosing a type-writer. A series of lectures has been arranged where each type-writing instrument is explained by an expert. The third of the course was delivered by Mr. Herbert Langford, who adduced much evidence in support of his claims that the ink pad, the centre guide and the pointer of the "Yost" were unique and effective improvements.

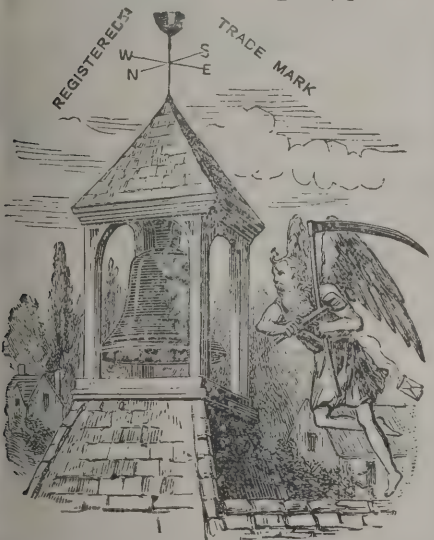
THE preservation of human life should be the first study of all who have control of our streets and the construction of our buildings; therefore it more especially devolves on architects, engineers and others to gain all the knowledge they can of the most effective materials in the market which will further this end, as it must be borne in mind that, however skilful an architect or engineer may be, if his specification is carried out with inferior material all his labour is lost. Few people at any time think of the great number of accidents occurring daily on the stairs of public buildings, warehouses, workshops, in passages, on coal-plates, and the thousand and one covers which dot our footpaths, through these being worn and slippery. Were they to study these statistics for one moment they would be shocked at the number of such accidents, in some instances injury for life being the result, and in others the loss of life

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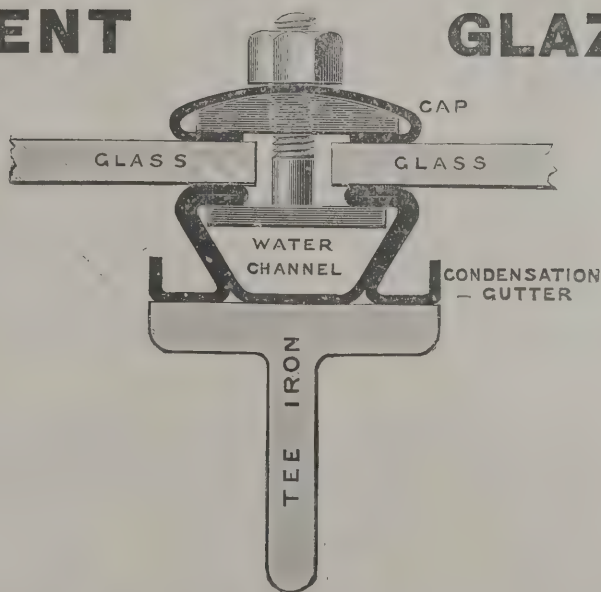
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itself. For many years those whose business it is to study this matter have been looking for something which should be effective, and yet not costly. This has at last been found in Mason's Patent Treads, which is proved by the readiness with which it has been adopted by the various Government offices, School-Boards, Bank of England, Civil Service Supply Association, Army and Navy Supply Stores, the various railway companies, Local Boards, Corporations, &c., where the enormous traffic necessitates the constant attention of the officials to this matter. From our knowledge of this patent we are not surprised that in order to fully develop the various uses to which it can be applied it has been found necessary to form a company, under the title of the Safety Tread Syndicate, Limited, with offices at 15 Barbican, E.C., an abridged prospectus of which appeared in our last week's issue.

THE execution of the design furnished by Mr. J. L. Pearson for the John Couch Adams memorial, to be placed in Truro Cathedral, has been entrusted to Mr. Juleff, of Grampound Road.

THE new drainage works just completed at St. Bartholomew's Hospital, which were executed under the superintendence of Mr. E. B. P'Anson, the surveyor to the hospital, particulars of which we gave in our last week's issue, were ventilated on the "Climax" Ventilating Co.'s system, their patent direct-acting soil-pipe extracting and patent three-sided mica valve inlet ventilators being used throughout, the same being supplied by the "Climax" Ventilating Co., Limited, of 15 Great George Street, Westminster, and 93 Hope Street, Glasgow.

AT Christchurch, Cairo, memorials have just been placed of Major-General Sir Herbert Stewart, K.C.B., who died at Jakdul of wounds received at the battle of Abu-Kru, when in command of the desert column in the Nile Expedition for the relief of Khartoum. These consist of a handsome polished-brass altar-rail, with telescopic centre and an inscription brass. The designs were prepared and the work executed by Messrs. Thomas Pratt & Sons, memorial art workers, Tavistock Street, Covent Garden, who had previously supplied for the same church the memorial-brasses to Lieutenant-General Valentine Baker Pasha, his wife and daughter.

IN the new play, "Becket," the archbishop's robes worn by Mr. Irving and those of the bishops, both English and French, were made by Messrs. Thomas Pratt & Sons, Tavistock Street, Covent Garden.

THE new schools, Great Ayton, are being warmed and

ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

THE new Harris Free Library and Museum, Preston, is now almost completed, and we understand it is intended to open the building this summer. The pavements have just been completed, and there is a marked consistency of treatment throughout the whole. The grand staircase and central hall on the ground floor are laid with a pleasing combination of rouge giotte, dove, black, vert-antique and white-veined marbles, with Hopton wood stone; the central ornament being in the form of a radiating star, which, seen from the gallery, is exceedingly effective. The pavements of the principal and upper floors are in Roman mosaic, the borders chiefly in black and white marbles arranged in strictly classical patterns, and the centre a mixture of rouge verona and Carrara marbles. Mr. James Hibbert, of Preston, is the architect, and the work has been carried out from his designs by Messrs. J. & H. Patteson, Oxford Street, Manchester.

A NEW turret-clock, showing the time upon one external copper dial 5 feet in diameter, has been placed in Catterick Church, North Yorkshire. Messrs. Poth & Sons, Leeds, are the makers. They are also making a new clock for Mr. Yeomans, for Osmotherley Church, and clocks for the parish church, Hartlepool; West Rainton Church; North Stockton Railway Station, Durham; Richmond Town Hall, Surrey; and Colne Town Hall, Lancashire; Cambridge, Northampton, Oldham, Bradford and other important places.

THE Middlesex County Council are entitled to credit for the practical step they have taken in establishing a class on plumbers' work in connection with the Museum of Sanitary Appliances and Testing Department belonging to the Hornsey Local Board at Highgate. The Council have appointed Mr. George Taylor, registered foreman plumber, as teacher, and have made it conditional that the teaching shall be alternately technical and practical, and that the class shall be open to those actually engaged in the plumbing trade, either as apprentices or otherwise. The merely nominal fee of 2s. 6d. for the course is made, and this will be returned to those students who make 75 per cent. of the possible number of attendances.

THE Local Board of Clacton-on-Sea have accepted a tender from Messrs. B. Cooke & Co., of Battersea, London, S.W., for the construction of sewers and sewage outfalls for the district of Great Clacton. The accepted tender is 10,374/. The works

ALL KINDS OF TILES FOR FLOORS WALLS HEARTHES GRATES CHIMNEYS BATHS &C.

MANSFIELDS' TILES.

MANSFIELD BROTHERS CHURCH CRESLEY BURTON ON TRENT.

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are to proceed immediately. Mr. W. H. Radford, C.E., of Nottingham, is the engineer to the scheme.

THE Local Board of Caversham have instructed Mr. W. H. Radford, C.E., of Nottingham, to prepare a scheme for the sewerage and sewage disposal of their district.

CHICAGO EXHIBITION NOTES.

MESSRS. JEFFREY & CO. will exhibit at the Chicago World's Fair specimens of their manufactures of all classes of wall-papers, representing the highest class of embossed leather papers finished by hand, flocks and various examples of hand-printed papers and friezes and machine-printed papers. The decoration facing the chief entrance of the exhibit is the "Trio" designed by Mr. Walter Crane, which comprises a most effective frieze of singing birds, in which he has made a new departure by the use of a pilaster, into the panels of which are introduced child-figures, representing Music, Painting, and Poetry, while underneath lies the open book on which is inscribed—

Life's house to deck come Graces three,
Music, Painting, Poesy.

This is shown in two renderings, viz. in blue and yellow and also in red and yellow. Another new design, by Mr. Lewis F. Day, the "Piccolomini," is a large scale pattern of conventional foliage and flowers. It is worked in tones of olive and blues on a pale ground, giving all the richness of a silk; and secondly, in a scheme of red, orange and russets. The "Vine" pattern, by Mr. Heywood Sumner, has great freshness as to decorative treatment. The vine springs from a base, with an upper terminal forming almost a pilaster in itself, and yet can be used as the entire covering for a wall or in combination with a diaper. It is printed in gold on a white satin ground, the gilding being tinted with a delicate green or yellow. The examples of the embossed leather papers, which have all the appearance of antique leathers are "The Peacock Garden" and "Golden Age," by Mr. Walter Crane, the "Florentine," by Mr. L. F. Day, while printing in lacquers, is shown to great advantage in Mr. Walter Crane's "Corona Vite." Mr. H. W. Batley's "Buckingham" in flocks; Mr. W. J. Muckley's frieze of "Naturalistic Roses"; Mr. S. Mawson's green and gold decoration; and Mr. C. F. Voysey's frieze, filling and dado are each fine specimens of paper-staining in its various branches.

By direction of the German Emperor a model of the new

Reichstag building, on the scale of one-twentyfifth, will be sent to the World's Fair. The model is $5\frac{1}{2}$ metres long, $4\frac{1}{2}$ deep, and 3 metres high, and has cost nearly a thousand pounds.

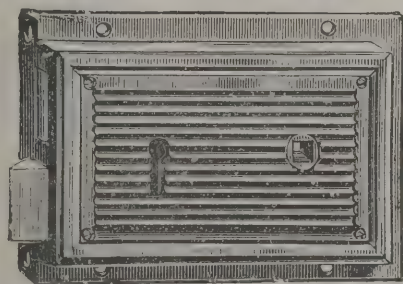
THE British section of the Chicago exhibition will, in the women's department, include a representation of English literature, old and new, and for this a literary sub-committee has for some time been preparing. Among the manuscripts is an illustrated unfinished copy of "The Boke of St. Albans," from the pen of Dame Julia Berners, abbess of an old convent in Hertfordshire. Modern English literature is represented by about one hundred works of fiction, and by books of poetry, science, biography, travels, &c.

THE "exhibit" of the School Board for London, prepared under direction of Mr. John Lobb, chairman of store sub-committee, for the Chicago Exhibition, was on view in the Board Offices, Victoria Embankment, on Wednesday, the 15th. It was made up almost entirely of "hand and eye" work executed in the schools by children of all ages from four to fifteen, and included specimens of Kindergarten work of all kinds, needlework, laundry-work, writing, maps, freehand, model and technical drawings, shading from the cast, designing with colours, designing with coloured papers, modelling in cardboard and clay, woodwork, ironwork, and brass and copper work.

NEW CATALOGUES.

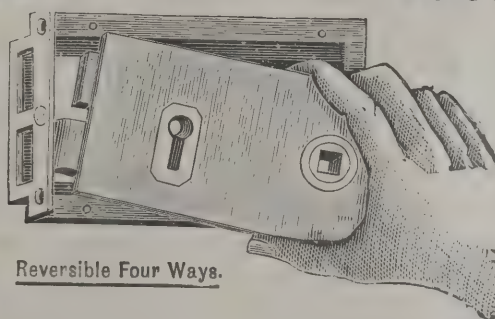
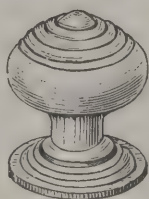
MESSRS. B. WARD & COMPANY, 15 Great George Street, Westminster, S.W., have sent us a catalogue of their patent specialties, describing and illustrating their patent granite concrete stable paving (grooved and channelled), their improved and registered system of stable drainage, patent concrete paving for all kinds of buildings, also for roadways and footpaths, patent steel webbed fireproof solid concrete floors, patent system of finishing wood floors with concrete, wood block, asphalte, tiles, &c.; patent limestone concrete landings and staircases, artificial stone dressings in red, buff, grey or green, improved granite concrete paving for footpaths, station platforms, &c., works in artificial stone, improved wood-block flooring, improved fibrous plaster slabs, &c. These slabs are a capital substitute for ordinary lathing and coats of plaster at a very slight extra cost, but saving time in fixing and drying and more fire-resisting, and a defence against damp. The wood-block flooring has been designed to secure a floor that is economical in cost in addition to being solid and sub-

HILL'S PATENT LOCKS AND OTHER FITTINGS.



All kinds of Rim and Mortice Locks, Door Furniture, Sash and Casement Fittings, Swing-door Hinges, &c., kept in Stock. (1)

(Patent Bolt for Narrow Stiles.)



Reversible Four Ways.

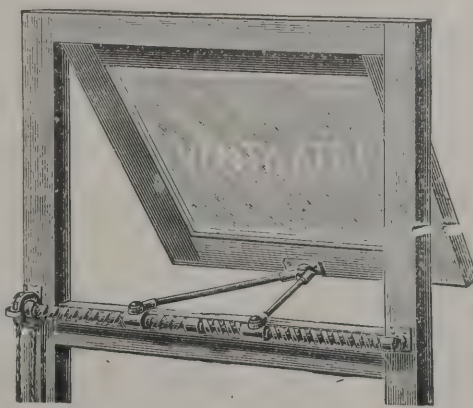
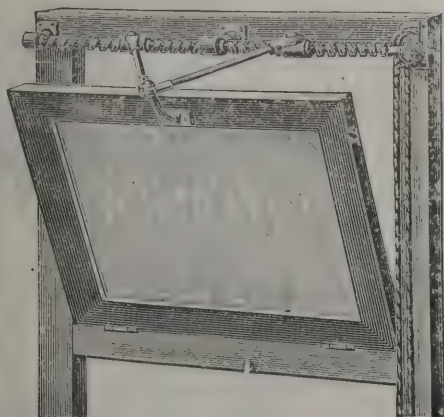
Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod on right or left side.

(Triple-Action Bolt.)

PRICES AND PARTICULARS ON APPLICATION.

Notice.

Buyers should satisfy themselves that Goods offered by other Firms do not infringe Hill's Patent Rights.



JAMES HILL & CO., 100^A Queen Victoria St., London, E.C.

stantial, complex methods of fixing the blocks having been eliminated. They may be had in a variety of woods and also designs. The artificial stone dressings are also executed to architects' own designs, and have some advantages over stone or terra-cotta in regard of cost and durability; also the process of manufacture is not liable to any occasional uncertain results. For staircases the steps are cast separately or formed *in situ*, and the company claim to have had great experience in forming staircases *in situ* and in one solid block, and these are less costly than stone. It is also claimed for them that they are fireproof. The concrete paving serves for innumerable purposes. In houses there are kitchens, sculleries, &c., and then there is the back yard, perhaps stables and stable yard, where the paving is required. There are cattle markets, kennels, piggeries, warehouses, laundries and washhouses, factories, mills, breweries, schools, hospitals, drill sheds; all these are but a few instances of endless places that might be mentioned. The paving for stables, cowhouses and the like appears to have given general satisfaction wherever used. The wear and tear in stables soon shows a mark for good or evil, and therefore a good material and system for stable drainage carries with it its own certificate of utility. A very long list is given of the places where this company has carried out works.

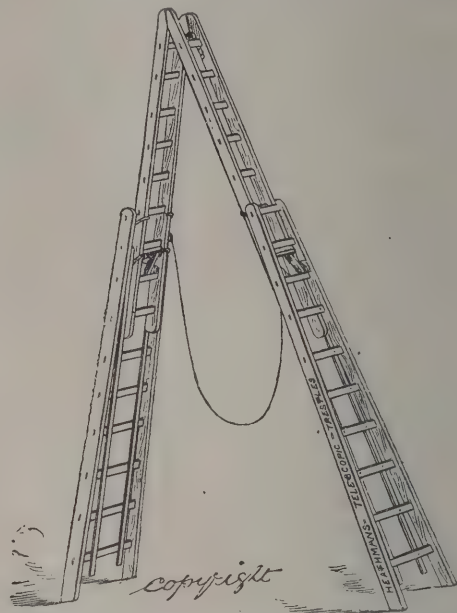
THE "ECLIPSE" PAINT REMOVER.

WE had occasion to refer to the merits of this specialty more than a year ago, and we are glad to notice that our prediction as to its success has been more than realised. It has been largely adopted by railway companies, builders and contractors; in many cases where other paint removers have failed to give satisfaction. The proprietors of the "Eclipse" guarantee its effectiveness, and claim that there is no paint, enamel, varnish on wood, stone or iron it will not rapidly remove. The "Eclipse," moreover, neither injures the surface nor the paint or varnish afterwards used, so that it may safely be recommended for the best class of interior work. The "Eclipse" Concentrated Paint Cleaner, and the "Eclipse" Washing Fluids are for the purpose of removing dirt and grease on wood or metal, being at the same time a powerful disinfectant.

The address of the manufacturers of these specialties is at 1A Crescent, Minories, London, E.C., and fuller particulars will be forwarded on application.

NOTES ON NOVELTIES.

New Telescopic Trestles.—We illustrate a telescopic trestle supplied to the Junior Constitutional Club by Heathman & Co., the patent extension ladder makers of Endell Street,



London. It is 12 feet when closed, and extends up to 22 feet, but can be adjusted at any lesser height, and closes most compactly to stow away and carry about. One person can manage it.

ARTISTIC WALL DECORATION.

THERE can be little doubt that the wall-paper buying public are year by year getting more critical and more exacting in their demands, utterly refusing to be satisfied as of yore with the decorator's small stock of papers. They are now beginning to look askance at even pattern-books, and every decorator

Electric Lighting and Power.

THE WEYMERSCH BATTERY.

[ED. C. DE SEGUNDO, M.Inst.C.E.,
Executive Engineer.]

CAPITAL, £20,000.

[CH. F. JONES,
Secretary.]

The Weymersch Battery Company, Limited, beg to announce that their Battery can be seen in operation on Friday in each week,
Driving Ventilating Fan, Water Pumps, Electric Lamps, and also Charging Accumulators

Works:—COLWELL ROAD, EAST DULWICH, S.E.
OFFICES AND SHOW-ROOMS:—

2 VICTORIA MANSIONS, 28 VICTORIA STREET, WESTMINSTER, S.W.



B. Ward and Company,
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Acknowledged by excellent Testimonials the
Best House in the Trade for

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AS SUPPLIED TO H.M. GOVERNMENT.

Copper and Galvanised
SASH LINES.

Gold and Silver Picture Wire,
WIRE ROPES.

Established 1875. Telegrams:—"Orchard."

must be weary of the oft-repeated query, "How will it look up?"

Messrs. Percy Heffer & Co., 64 Berners Street, have taken large show-rooms, and expensively decorated them with a view to satisfying the above and like queries. Anyone provided with the decorator's card can see there any number of applied decorations. It would be absolutely impossible to mention their papers in detail; but we were particularly struck by some of their bold decorative friezes, 30 inches deep and 42 inches in repeat, which, while they harmonised to perfection with the fillings yet gave a distinctly fresh decorative effect to a room, while the average frieze is, as a rule, but a tame reproduction of the colours of the filling.

We understand from their representative, who showed us round, that although they were making artistic wall-paper their specialties, their prices ranged from 3d. to 3s., so that no one need expect to find high-class paper outside their price. We strongly advise our readers to inspect these excellent wall-papers, which show that the canons of art are not unknown to the designers.

ELECTRIC LIGHTING OF LAMBETH.

THE Electric Lighting Committee of the Lambeth Vestry have consulted Mr. W. H. Preece, the chief consulting engineer to the Post Office authorities, as to the best mode of carrying out the electric lighting order granted by the Board of Trade to the vestry last year, and subsequently confirmed by Parliament. In his report to the committee Mr. Preece remarks that it has been the fashion to regard the electric light as the lamp of luxury, and strange views are frequently expressed as to its costliness and as to its being within the reach only of the rich. The experience at Newcastle, where gas is only 1s. 10d. per 1,000 cubic feet, and at Bradford, shows that it is now within the grasp of the poor man. The average cost per electric lamp per annum at the former place was last year 6s. 3d., and at the latter place 9s. 7d. Electricity can now be produced cheaper than gas. He is now engaged, Mr. Preece goes on to remark, in determining the best and cheapest mode of fitting up small tenements, so as to bring the light within the reach of the poor. He estimates that the total capital required to light the whole parish will probably eventually reach 300,000l., but adds that it will take some years and much prosperity to attain that result. To comply with the requirements of the provisional order and to make a good start will

not require more than 75,000l., for which sum sufficient plant can be obtained to supply energy to 20,000 lamps alight at one time, which would mean 40,000 lamps fixed.

THE CRYSTAL PALACE, SYDENHAM.

AT the half-yearly meeting of the Crystal Palace Company, the chairman, Mr. G. T. Rast, observed that the past year had been full of trouble and anxiety, and it was not surprising then that a great institution like theirs should have suffered because they must all remember that, from the very nature of their building and grounds, they had a certain fixed expenditure which must be maintained, while they had a very uncertain revenue. They were committed to the opening of the electrical exhibition last year. Although an immense success from a scientific point of view, it was an immense failure from a financial point of view. In fact, their net receipts compared with those of a Handel Festival year, were about 8,000l. less, and this he attributed entirely to the exhibition, because their space in the building was blocked by it, preventing them from holding other shows. He regretted that the season-ticket receipts had fallen off by about 1,000l., notwithstanding the efforts they had made to increase their revenue from this source. With regard to the Crystal Palace Parade, the road would be completed in a few days, and he believed that it would be one of the finest in the suburbs. One of the shareholders said that the management ought to circumscribe the gardens and dispose of the land, which he understood they could do at a very high price. The Chairman in reply stated that they were always very willing to receive suggestions. As regarded the sale of the Palace, if a proper scheme were submitted for its purchase, it would have a very favourable reception from the directors, assuming that they were satisfied in regard to the position of the intending buyer and the price offered. His own opinion was that it would be desirable to secure for the public the Alexandra Palace in the north and the Crystal Palace in the south.

LINCRUSTA-WALTON.

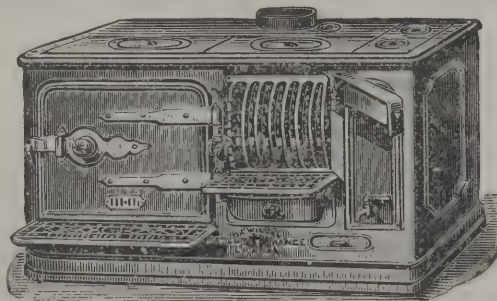
WE have received some half-dozen or more new sheets, showing many new and beautiful designs for house decoration in Lincrusta-Walton. Those responsible for the designs are

The "Wilson" Portable Cooking Ranges, With Lifting Bottom Grate for Regulating Size of Fire.

JUST AWARDED THE GOLD MEDAL AT THE UNIVERSAL COOKERY EXHIBITION, PORTMAN ROOMS.

21 PRIZE MEDALS.

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Most Durable,
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They are Portable, cannot
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larger Ovens and Boilers,
than any others.

THE WILSON ENGINEERING CO., LIM., 227^K HIGH HOLBORN, LONDON.

FIRST-CLASS JOINERY

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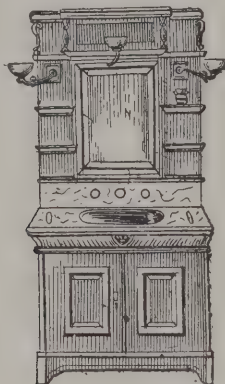
B. E. NIGHTINGALE, Builder & Contractor,

ALBERT WORKS, ALBERT EMBANKMENT, LONDON, S.E.

certainly to be congratulated in being able to present so varied an assortment, the whole being characterised by such excellent good taste. To take the sheets seriatim we find one devoted to borders and sundries, others to door-panels and various other panels, ceilings, friezes, fillings, dados, &c. We cannot do better than recommend our readers to inspect the new designs, which are evidently the outcome of careful study by skilled artists. Among the figured work are door-panels, representing respectively Diana, Ceres, Flora and Pomona. The designs for ceilings and for friezes are all in appropriate character for the positions to be decorated, and specimens of bold and graceful treatment will be seen in the fillings, as well as in the dado work.

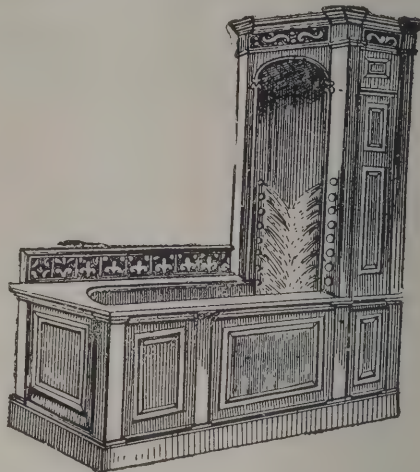
HIGH-CLASS PLUMBING.

WE note with satisfaction the increased interest taken in the employment of qualified plumbers, and the efforts made to raise this particular trade to a higher level. It is generally admitted that the arrangement of our drainage requires more than a rudimentary knowledge—in fact, a scientific training in



the principles of sanitation. We are glad to draw attention to this connection to a firm of registered plumbers, Messrs. Peattie & Axtell, of 1 Gloucester Road, South Kensington, S.W., and Oxford. Their experience almost entirely consists

of high-class West End sanitary work, hotels, mansions, flats, &c., attended with very uniform success. Every branch of the trade receives attention—drainage, of which the firm have a specially-devised system, bath fitting, hot and cold water fittings, heating apparatus, public bath construction, &c. Their large showrooms are stocked with every variety of



sanitary appliance in domestic use, plans of house drainage, and illustrations of works executed by the firm, amongst which municipal work has a prominent place. The principals of the firm give personal attention to the work, and we are confident that their success may be relied upon. We illustrate above modern patterns of lavatory and bath.

THE USE OF STEEL FOR CONSTRUCTIVE PURPOSES.*

STEEL is an alloy of iron with a small percentage of carbon and other elements in minute quantities, an alloy of iron which can be poured direct from the furnace in a state of fusion and cast into malleable ingots.

* A paper read by Mr. Richard Moreland, M.Inst.C.E., M.Inst.M.E., at a meeting of the Society of Architects.



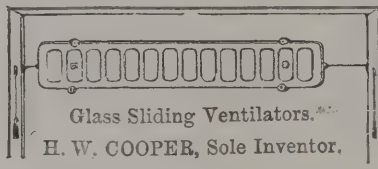
H. W. COOPER & CO., LIM.,

MANUFACTURERS OF COOPER'S GLASS, REVOLVING, CIRCULAR, AND SLIDING VENTILATORS (H. W. COOPER, SOLE INVENTOR).

Perforated Glass.



Glass Circular Hit and Miss Ventilators.

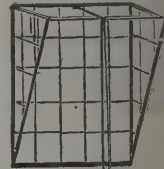


Glass Sliding Ventilators.
H. W. COOPER, Sole Inventor.

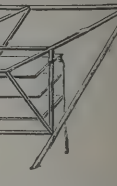
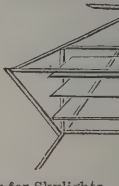
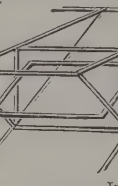
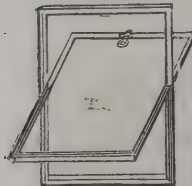
Improved Glass Louvre Ventilators.



Hopper Light.



IMPROVED COPPER, BRASS, GUN-METAL, AND IRON CASEMENTS:



Improved Hopper for Skylights.

Offices—28a UPPER GEORGE ST., EDGWARE RD., LONDON, W. Steam Works—LITTLE QUEEN ST., UPPER GEORGE ST., EDGWARE RD., LONDON, W.

Awards Obtained:—LONDON, 1862, 1874; PARIS, 1867, 1878, &c.

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147 STRAND, LONDON, W.C.

Vol. XLVIII. of THE ARCHITECT. Handsomely Bound in Cloth, Gilt Lettered, Price 12s. 6d. Office—175 Strand, London, W.C.

Carbon is supposed to be combined or dissolved, and special characters and qualities may be given to the steel by the introduction of manganese chromium, &c. The alloy of carbon and iron possesses the property of being hardened or tempered. So-called mild steel cannot be hardened; this contains 99½ per cent. of iron, and ½ per cent. of carbon. The process of manufacture eliminates all impurities from the iron before the requisite proportion of carbon is added.

Wrought iron contains 96 to 97 per cent. of iron interspersed with laminated slag. It cannot be poured in a fluid condition from the furnace, but is taken from the puddling furnace in a pasty, semi-fluid condition, and has to be rolled or hammered to be brought into a malleable condition.

The limit of elasticity of mild steel is greater than that of wrought-iron. 15 to 18 to 20 tons per square inch can be applied before any material extension and permanent set or deformation is observed.

The advantages claimed for mild steel as a constructive material over that of iron are:—The high range of the limit of elasticity in proportion to the ultimate tensile strength; its greater range of its elastic action compared with that of iron; its superior tensile strength over the latter material; its great power of endurance; and greater elasticity than that of iron; its remarkable ductility and resistance to impact; and that it is a more reliable material in every sense, and capable of standing more rough usage during process of construction.

Plates, angles and tee sections can be produced of greater length and width and area, so that fewer joints and connections are made.

Structures in steel can be made from 30 to 50 per cent. lighter than those of iron of the same strength. The structural strength is thus increased as the dead load is reduced due to the structural weight.

The tensile strength and elastic limit of mild steel plates are nearly the same lengthways as crossways.

As thinner plates in steel can be used in construction than those in iron, the rivetting of the structure is much stronger, due to the lessened length of the rivet.

The remarkable ductility of the mild steel as used for constructive purposes, provides that, with an ultimate tensile strength of 30 to 32 tons, and an elastic limit of 16 to 17 tons per square inch, it will have, after drawing it into wire, a tensile strength of 70 to 75 tons to the square inch. The elongation before drawing would be 15 per cent. in 12 inches, and after drawing 4 per cent. in 12 inches; and suspension bridge links

are purposely stretched and strained to the elastic limit, giving them more rigidity by destroying some of its elasticity than in their original condition.

The process of the manufacture of the mild steel is carried out with the greatest certainty and with uniform results so that the utmost confidence can be placed in the material. The iron used for the purpose is melted and completely deoxidised from all slag and impurities, and a pure iron is thereby produced; and then the requisite carbon is introduced, which thoroughly combines with the metal, and when cast the material called mild steel is produced. The proportion of carbon to the iron determines the ductility and character of the material as regards ultimate extension and elastic qualities.

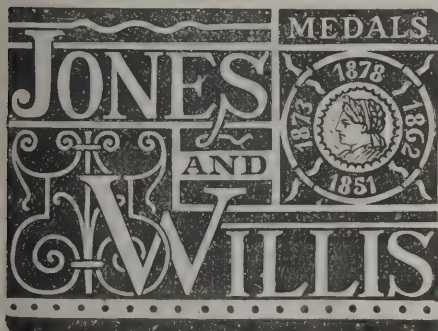
The pure iron is useless as a constructive material, and only when combined with the requisite quantity and proportion of carbon does it become of use. Thus, as a combination of iron and carbon it is capable of assuming a condition remarkable for its great strength to resist fracture, and for its great ductility and elasticity. The mild steel which is now generally manufactured for constructive purposes is capable of resisting a tensile stress of from 28 to 32 tons, with an elongation of 20 to 25 per cent., and a reduction of area at fracture of 30 per cent. to 50 per cent.

This material is used in the construction of steam boilers, and these are now capable of being constructed of large dimensions, and to carry pressures of steam up to 200 and 250 lbs. to the square inch.

The marvellous ductility of the material is shown and illustrated in the manufacture of solid-drawn seamless air and gas cylinders and vessels. They are drawn by hydraulic pressure from a single piece of steel, either as solid cylinder or slab or disc; a mandril forces the metal through a die of the requisite diameter and produces a cylinder with an end, a solid end, and then a neck is drawn at the other end and so a vessel is produced of a cylindrical form in the shape of a bottle and can be made to an external diameter of 12 inches and a length of 7 feet 6 inches, with a thickness of half an inch, and this will stand a test of 300 atmospheres equal to 2 tons per square inch.

Examine specimen of a seamless cylindrical steel gas vessel, 7 inches diameter, 4 feet long, manufactured by Mr. Samuel Walker; the inventor being Mr. Howard Lane, of Birmingham; and a specimen of a circular flat disc of the material from which they are drawn.

See specimen of Dalzell steel which has been pressed by hydraulic pressure by a mandril into a bowl through a die.



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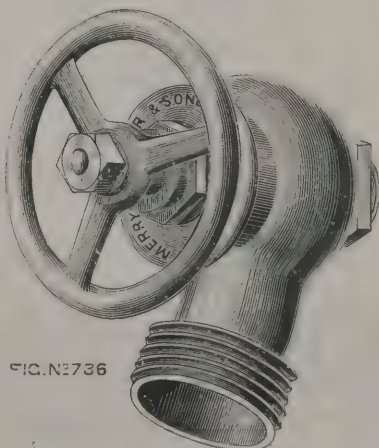


FIG. N2736

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The same property enables the material to be used for the manufacture of projectiles. In the case of shells the effect of the explosion becomes much greater, in consequence of its enclosure in a material requiring great disruptive energy to fracture it.

The ductility of the mild steel is utilised in the manufacture of tubes, which upon being drawn through circular dies by hydraulic pressure over mandrils enable them to be produced as concentric seamless tubes, and of various thicknesses, the least being No. 22 gauge, about 1-30th of an inch in thickness, and these can be made from $\frac{1}{8}$ inch to $1\frac{3}{8}$ inch thick; they can be drawn 2 inches, &c., No. 16 gauge thick, 1-17th inch thick. The tubes possess great strength compared with their weight, and these are made for the manufacture of cycles, a manufacture which has become an important item in our home industries. A cycle can be made for racing purposes not to exceed 14 to 15 lbs. by means of these steel tubes. A specimen was exhibited to illustrate this.

The steel plates and angles are also used for the manufacture of ships. The dead weight is not only less, enabling more freight to be carried in proportion to the displacement, but they are made stronger, capable of withstanding impacts and shocks beside the multitude of twisting and transverse strains which are constantly happening to a ship. The nature of the material is of advantage for these structures, as the strength is about the same across the plate as lengthways.

A sketch from *Engineering*, January 20, 1893, was exhibited of the effect of a collision on a torpedo boat made of steel plates, with a tensile strength of 27 tons to square inch.

It was used in the construction of the Forth Bridge, a structure both novel and exceptional in its details, having to support its own enormous load beside that of the moving load (viz. two railway trains at express speed) and to withstand the effects of cold and heat which probably produce greater internal stress on the structure than the effect of the moving and dead loads.

Quoting from remarks made in *Engineering*, February 28, 1893, in the description given of this structure and the material used:—

"The choice of a material for constructing a bridge of novel design, of extraordinary magnitude, and exposed during erection to the effects of powerful atmospheric disturbances, must have been the subject of much anxious thought and reflection to the engineers. But, in whatever way the decision was arrived at, there can be no two opinions that the choice

was a happy one. From beginning—and probably a long time before the beginning of this work—to the end this steel was subjected to every conceivable test, both in a properly scientific manner, for purposes of research and investigation, and in an entirely unscientific manner by workmen, whose only excuse can be that they did not know better. But in all cases the steel stood the test, and a more uniform, a more homogeneous, and more satisfactory material could not be wished for. The Board of Trade's stipulations in regard to structures do not go further than to lay down the rule that the maximum working stress should not exceed one-fourth of the ultimate breaking strain of the steel. No difference is made between the tensile and compressive stresses, nor is any regard paid to the differences between stresses due to dead load or live load, alone or in combination, nor to the circumstances arising from changes occurring frequently or rarely in the nature of the stresses. The engineers, therefore, laid down after consultation with the Board of Trade, and with their approval, certain rules in regard to the stresses admissible under varying circumstances. For tension members the steel was to have an ultimate resistance of not less than 30 nor more than 33 tons per square inch, with an elongation in 8 inches of at least 20 per cent. For compressed members a resistance of not less than 34 tons, nor more than 37 tons per square inch, with 17 per cent. elongation. With regard to varying stresses for a load varying between *nil* and a maximum, 20 tons per square inch of section to be assumed as the ultimate strength if the change occurs frequently, and 22½ tons if occurring rarely.

For stresses alternately tensile and compressive, the ultimate stress to be 10 tons if frequent, and 15 tons if seldom, one-third of the ultimate strength to be considered the working stress. The rivet steel to have an ultimate strength of 27 tons 30 per cent. elongation, and shearing resistance to be 22 to 24 tons per square inch. For tension members the sectional area of the rivets in the joints to be one and a half times the useful section of the boom, and for compression members the rivet area in butt joints to be half the useful section of the member. The steel supplied was from the London Steel Works of Messrs. Siemens, the Steel Company of Scotland, the Dalzell Company near Motherwell, and the Clyde Rivet Company for rivets.

The adoption of the amount of stress to be put on a structure within this limit is a matter for preference and judgment. The factor of safety can of course be lower for the support of dead loads exclusively, and the settlement for live loading is a matter for specific determination, and has to be determined

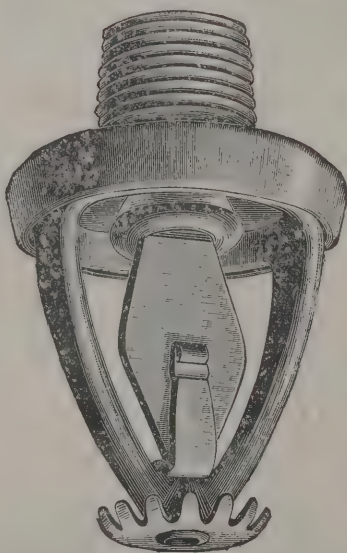
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1873.

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by the nature of the structure, and the details and method of its loading.

A number of selected specimens of steel, in the preparation of which Mr. Thomas Beeley, of Hyde Junction Works, Manchester, has kindly assisted, are exhibited, to show the breaking strain and ultimate limit of elasticity, and to show the ductility of the steel, of which the following is a list.

The following examples of construction (which were illustrated by wall diagrams) have been manufactured and erected during the last ten years:—

Example of a Roof Principal 61 feet Long, at Old Street Manufactory.

14 feet 6 inches deep, with 4 by 3 by 7-16 top and 4 by 3 by $\frac{3}{8}$ steel angles at bottom, with light angles and flat bars for the cross bracing. It supported a slate roof, wood, timbers and boards, with glass on each side at the top. Hoisted into position as one piece.

Example of a terminal principal of the roof supporting its own share of its end bay and itself, 63 feet in length, and one end of six principals of adjoining roof at right angles to it, 63 cwt. each. The depth of principal at centre is 15 feet, and is composed of 7 by 3 $\frac{3}{4}$ for top, and 8 by 4 steel rolled girders, with cross bracing as shown. The lower member had to be strong enough between brace connections to support the ends of principals.

The total weight supported is 25 tons, 12 cwt. and the weight of principal 35 cwt.

A Steel Roof Principal over Battersea Town Hall.

Mr. E. W. Mountford, Architect.

These were 56 feet span, and a height from springing of 35'4 feet, and to soffit 18 feet, which is constructed of an elliptical shape. The bases are 1 foot 4 inches wide, giving a total length of 58 feet 8 inches. The top and bottom members are of 4 by 4 by $\frac{1}{2}$ steel, see section, a steel plate is carried up 18 feet from supports, and the bracing from that is 3 $\frac{1}{2}$ by $\frac{1}{2}$ flat, 3 by 3 by $\frac{3}{8}$ angle, 4 by $\frac{1}{2}$ flat, 3 by 3 by $\frac{3}{8}$, with a vertical eye of 4 by $\frac{1}{2}$, all in steel, a plate 10 feet long, 4 by $\frac{1}{2}$, is rivetted on top member, from the $\frac{3}{8}$ web to the first intersection of brace.

Battersea Town Hall. Roof over Council Chamber.

Mr. E. W. Mountford, Architect.

Two principals, 35 feet span of steel angles and flats, rise 22 feet 6 inches. The tie bar is curved to a radius of 23 feet.

Two principals, same span, but with flat top as shown. Principals 11 feet apart.

Roof over the Hall of the Mark Masons.

Mr. C. Driver, Architect.

The roof of this hall was desired to be carried in one span of 41 feet 9 inches between the walls, and to give a clear height of 21 feet from floor to ceiling, while one wall was only 14 feet 6 inches from floor, and it was not permissible to raise it while the roof was to be supported within a limiting angle from the edge of the wall, and from this angle limiting line to the ceiling, which was required to be curved, the way was only 12 inches. The roof principals were designed and carried out. They were 42 feet 9 inches over all, 3 feet deep at the centre, with a rise of curvature of 8 feet from the pring. The lower flange was level and the upper angle shaped for centre to curved ends. The depth at entry of curve was 12 inches, and at the tangent of the limiting line 1 inch deep. The web was $\frac{1}{4}$ thick throughout and the flanges top and bottom of 4 by 3 by $\frac{3}{8}$ steel angles. The bases of the ribs were supported and firmly connected to 6 by 5 r.i.j., 24 feet 6 inches long, which were secured to walls and piers. The girders for the floor of hall were connected to it as well as those supporting the floor beneath at the base of the stanchions. The construction carried out its intention and was a firm and stable structure, and produced no thrust whatever on the old walls of the building.

An Example of a Roof Rib of Lattice Work at Walthamstow Hall.

Bracing 48 clear span and 20'6 rise. It was delivered and hoisted into position in two separate portions and connected and rivetted together at the central line. The members were of 4 by 4 by $\frac{1}{2}$ T section with angles for cross-bracing. This produced no thrust on the side walls which were light.

The total height from roof supports to apex is 26'6.

An Example of an Octagonal Dome on Tower, St. Joseph's Retreat, Highgate.

Mr. A. Vicars, Architect.

This was constructed of eight steel ribs, 22'3 rise, and with a clear span of 38'6. They were 3'0 at base, 1'0 at crown, and all the covering fitted, and were fixed to a central ring 8'c diameter, 1'6 deep. The webs of 5-16 steel-plate flanges

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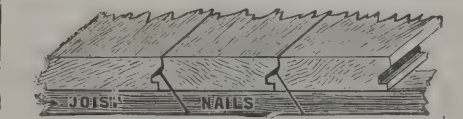
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of $2\frac{1}{2}$ by $2\frac{1}{2}$ by 5-16 steel angles. The purlins of $6\frac{1}{2}$ by $3\frac{1}{2}$ rolled-steel girders, and they, and a base tie of 6 by 3 channel steel were connected to the ribs all around. At the ring was constructed a lantern dome, and the roof was covered with copper sheathing. The ring was of 18 by $\frac{1}{4}$ steel and 4 by 3 by $\frac{3}{8}$ steel angles. The ceiling was constructed and supported on the inner flanges of the roof ribs. The thrust was completely taken by the construction.

An Example of a Curved Roof Rib of Steel Erected at Westminster Meeting House in October 1882.

It is 35.6 clear span with a rise of 14.9, clear depth at centre of rib 24" and width of feet 16". The web of $\frac{1}{4}$ plate and the angles of flanges 4 by 4 by $\frac{3}{8}$. The connection was made at the centre on the site, the two purlins being the two half-ribs with connecting angles and plates and cover angles on the angles of flange, and riveted in position on the site. The purlins, eight in number, were of 8 by 4 rib-joists. This is a light construction, and is designed to produce no thrust on the side walls of hall, and the result is a structure of simple rigidity.

Steel Girders for a Travelling Crane.

The crane is capable of lifting and lowering a dead weight of 20 tons, and with the weight of crab and machinery and allowance for rolling and moving load, each girder is calculated to support a central load of 20 tons, and this will give a stress on the flanges of $7\frac{1}{2}$ tons per square inch. The girders are 58 feet long, 15 inches wide, 3 feet deep, with thirteen available sections in the flanges. The girders are supported by the upper flange by bolts and by a plate which passes down from the carriage girder, and is bolted directly on the end of the girder, so the bolts supporting them are in shear and in tension. The girders are of the box form, the flange plates 15 by $\frac{1}{2}$, angles 3 by 3 by $\frac{1}{2}$, and the webs 5-16 thick. This illustration is given to show that a girder of steel will support a dead and rolling load unsupported sideways and in motion, liable at all times to sudden jerks and vibrations, and supported by bolts slinging it to its moving support.

Method of Trussing an Iron Girder, 60 feet long.

This was supported by a column in centre making two spans of 30 feet each by steel bars. This construction is at the works of R. Moreland & Son, supporting an end of a travelling crane. The girder was 15 inches deep, 14 wide, and weighed 3 tons 8 cwt. It was stoned and the column removed and the truss

added. It was made by affixing three double T standards of 6 by 3 by $\frac{1}{2}$, 6 feet long, with tie bars of 2.9 by $\frac{7}{8}$. Steel with cross bracing and lower tie of 8 by $\frac{3}{4}$. Steel bars double. The strength of this compound girder is equal to supporting a weight of 27 tons as a live and dead load. The weight of steel in the added truss was 38 cwt.

(To be continued.)

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

1985. James Joseph Sumner, for "Improvements in attaching door-knobs to doors and such like."

2056. Horatio Saqui, Ernst Jahncke and the "Future" Bolt Syndicate, Limited, for "Improvements in bolts or fasteners for doors, windows and the like."

2095. William Thomson, Baron Kelvin, for "Improvements in taps for water and other fluids."

2151. Frederick Egge, for "Improvements in and relating to padlocks."

2198. William Thomson, Baron Kelvin, for "Improvements in balances."

2275. Henry Harris Lake, for "Improvements in sash fasteners."

2297. Alfred Hemming and Frederick William Drewitt, for "Improvements in fire and other guards or screens."

2346. Edwin John Cheyney, for "Improvements in cocks and ball-valves."

2438. James Jemson, for "Improvements relating to stoves and fireplaces."

2491. William Newby Colam, for "Improvements in and relating to grip pulleys."

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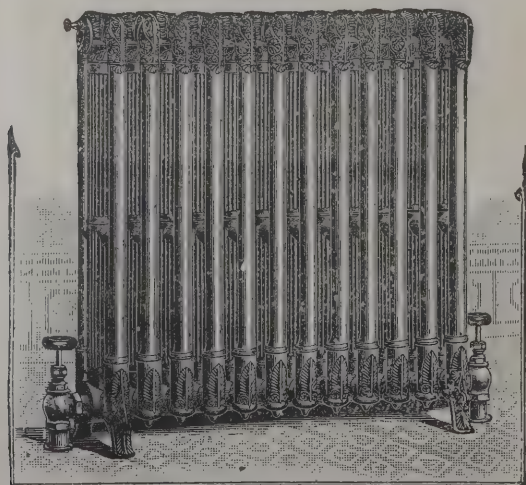
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ARCHWAY ROAD INFIRMARY.—March 1.—For Building Boundary Wall. Mr. H. Saxon Snell, Architect, 22 Southampton Buildings, Chancery Lane, W.C.

AYR.—Feb. 25.—For Adding Two Wings, &c., to Glengall Asylum. Messrs. Allan Stevenson & Kerr, 14 Cathcart Street, Ayr.

BARNSELY.—Feb. 28.—For Building Board Room and Shop Premises, for Co-operative Society. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BARRY.—March 6.—For Building Board School for Infants. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

BATLEY.—March 2.—For Building Two Through Houses. Mr. Walter Hanstock, Architect, Branch Road, Batley.

BELFAST.—Feb. 27.—For Building Villa. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BELFAST.—Feb. 25.—For Additions to Match Factory. Mr. Thomas Pentland, Architect, 81 High Street, Belfast.

BEVERLEY.—March 8.—For Building Boiler-house, Chimney Shaft, &c., at East Riding Asylum. Messrs. Hawe & Foley, Architects, Beverley.

BIDEFORD.—Feb. 24.—For Building Stables and Stores. Mr. R. T. Hookway, Architect, Bideford.

BOXMOOR.—Feb. 27.—For Extension of Church. Mr. T. Foster Woodman, Architect, St. Peter's, St. Albans.

BRADFORD.—Feb. 28.—For Building Offices for the Prudential Assurance Company. Messrs. A. Waterhouse & Son, Architects, 20 New Cavendish Street, Portland Place, W.

BRADFORD.—Feb. 28.—For Additions to Sanatorium. Mr. J. H. Cox, Borough Surveyor, Bradford.

BRIERFIELD.—Feb. 25.—For Building Two Shops and Houses. Mr. J. T. Landless, Architect, Manchester Road, Nelson.

BURTON-ON-TRENT.—Feb. 25.—For Buildings for Electric Light Works. Mr. F. L. Ramsden, Engineer, Gasworks, Burton-on-Trent.

CARLISLE.—Feb. 27.—For Building Four Houses. Mr. G. D. Oliver, Architect, Carlisle.

CARLISLE.—Feb. 27.—For Erection of Buildings forming Castle Street Entrance to Tullie House. Mr. W. Howard Smith, City Surveyor, 36 Fisher Street, Carlisle.

CARNFORTH.—March 6.—For Extensive Additions to Premises of Co-operative Society. Mr. Robert Walker, Architect, Windermere.

CHEPSTOW.—March 13.—For Construction of Cattle Market. Mr. F. Evans, Clerk, Local Board Offices, Chepstow.

CLECKHEATON.—March 6.—For Building Residence. Messrs. Mawson & Hudson, Architects, Exchange Buildings, Bradford.

COLCHESTER.—March 1.—For Building Two Shops. Mr. Henry Holloway, 40 Head Street, Colchester.

DARENTH.—March 6.—For Portland Cement to Exterior of Administrative Block at Asylum. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

DERBY.—Feb. 27.—For Building Pavilion and Nurses' Annexe to Infectious Diseases Hospital. Mr. R. J. Harrison, Borough Surveyor.

DUBLIN.—March 9.—For Supply of Building Materials, &c., for Three Years. Mr. P. H. Tuohy, Secretary, Office of Public Works, Dublin.

DUBLIN.—March 8.—For Building Dispensary, Summerhill. Mr. T. H. Atkinson, Board Room, North Brunswick Street, Dublin.

DURHAM.—March 1.—For Building Ten Houses. Mr. J. Henry, Architect, 11 North Bailey, Durham.

ERITH.—Feb. 28.—For Additions to Co-operative Stores. Mr. C. W. Brooks, 63 Finsbury Pavement, E.C.

GLASGOW.—Feb. 28.—For Construction of Two-Storey Goods Shed, for the Clyde Navigation Trustees. Mr. James Deas, Engineer to the Trustees, 16 Robertson Street, Glasgow.

GORLESTON.—March 10.—For Construction of Lavatory on the Beach. Mr. J. W. Cockrill, Borough Surveyor.

HALIFAX.—March 8.—For Extensions to Albert Mills. Mr. John Drake, Architect, Queensbury.

HALIFAX.—Feb. 28.—For Building Stable, Van Shed, Nurses' Home, Quarantine House, &c., at Stoney Royd Hospital. The Borough Engineer.

HAVERSTOCK HILL.—Feb. 27.—For Alterations at Fever Hospital. Plans at Norfolk House, Norfolk Street, Strand, W.C.

JARROW.—March 1.—For Building Board School and House. Mr. G. Mason, 4 Grange Road West, Jarrow.

LADYWELL RECREATION GROUND.—Feb. 28.—For Constructing Public Conveniences. Mr. De la Hooke, County Council Hall, Spring Gardens, S.W.

LEEDS.—Feb. 28.—For Building Lecture Hall. Mr. G. F. Danby, Architect, 46 Great George Street, Leeds.

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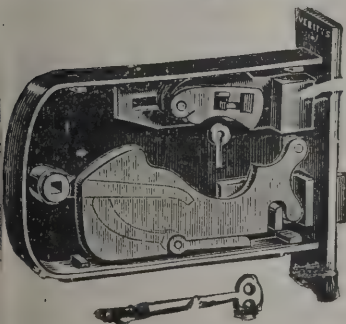
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CATALOGUES FREE BY POST.



LEEDS.—Feb. 28.—For Building Hotel, &c., Crossgates. Mr. Thos. Winn, Architect, 5 Park Lane, Leeds.

LITTLEHAMPTON.—March 2.—For Building Town Offices. Mr. H. Howard, Surveyor, 1 Church Street, Littlehampton.

LLANARTHNEY.—March 10.—For Building Parsonage. Mr. D. Jenkins, Architect, Llandilo.

LLANDOVERY.—March 10.—For Building Vicarage at Rhandermwgn. Mr. D. Jenkins, A.R.I.B.A., M.S.A., Architect, Llandilo.

LLANTRISSANT.—March 6.—For Additions to House. Mr. E. M. B. Vaughan, Architect, Cardiff.

LONGTON.—Feb. 28.—For Building Infants' Schools. Mr. J. P. Hulse, Architect, Market Street, Longton.

MORTLAKE.—Feb. 27.—For Supplying Broken Granite, Flints, Gravel, &c., and for Paviers', Masons', Bricklayers' and Jobbing Works. Mr. H. Richards, Murthly Villa, St. Leonard's Mortlake, S.W.

NELSON.—Feb. 27.—For Building Free Library, Technical School, &c. Messrs. Holtom & Fox, Architects, Dewsbury.

NEWARK.—Feb. 28.—For Building Villa. Messrs. Sheppard & Harrison, Architects, 17 Kirkgate, Newark.

PENTRE RHONDDA.—March 3.—For Extension of Bridgend Hotel. Mr. J. Rees, Architect, Pentre.

PETWORTH.—March 6.—For Alterations to Workhouse. Mr. H. Howard, Architect, Littlehampton.

PLASNET.—Feb. 27.—For Building Board School. Mr. Robert L. Curtis, Surveyor, 120 London Wall, E.C.

PONTYPRIDD.—March 1.—For Building Four Cottages. Mr. T. Rowland, Architect, Pontypridd.

PONTYPOOL.—Feb. 27.—For Building Bank Premises. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

PORTH.—Feb. 27.—For Building Thirty Houses. Mr. T. Roderick, Architect, Ashbrook House, Aberdare.

ROCHDALE.—For Building Mission Church. Messrs. Butterworth & Duncan, Architects, 4 South Parade, Rochdale.

ROTHBURY.—March 7.—For Alterations to House. Mr. C. Hodgson Fowler, Architect, The College, Durham.

ROTHIEMAY.—Feb. 25.—For Building Mansion. Messrs. Ross & Macbeth, Surveyors, Queen's Gate Chambers, Inverness.

SILLOTH.—March 6.—For Building House at Skinbūrness. Mr. G. Armstrong, Architect, 45 Lowther Street, Carlisle.

SOMERSET.—Feb. 27.—For Additions to Mansion, Farleigh, Hungerford Castle. Mr. W. H. Stanley, Architect, Town Hall Chambers, Trowbridge.

SPALDING.—Feb. 25.—For Building Infants' School. Plans at the Parsonage.

STOCKWELL.—March 2.—For Additions, &c., South-Western Fever Hospital. Mr. T. W. Aldwinckle, Architect, 1 Victoria Street, Westminster.

SWINDON.—March 14.—For Building Lodge, Latrines, Entrance Gates, &c., at Town Gardens. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

SWINDON.—March 11.—For Taking Down and Rebuilding 26 Wood Street. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

THURLTON.—Feb. 25.—For Enlargement of Board School. Messrs. Boardman & Sons, Architects, Norwich.

TREDEGAR.—March 5.—For Additions to Workhouse. Mr. W. L. Griffiths, High Street, Newport, Mon.

WEST HAM.—Feb. 27.—For Erecting Two Organs. Mr. Lewis Angell, Town Hall, Stratford, E.

WHICKHAM.—March 2.—For Building Fever Hospital. Mr. John Dinsdale, Surveyor, Whickham.

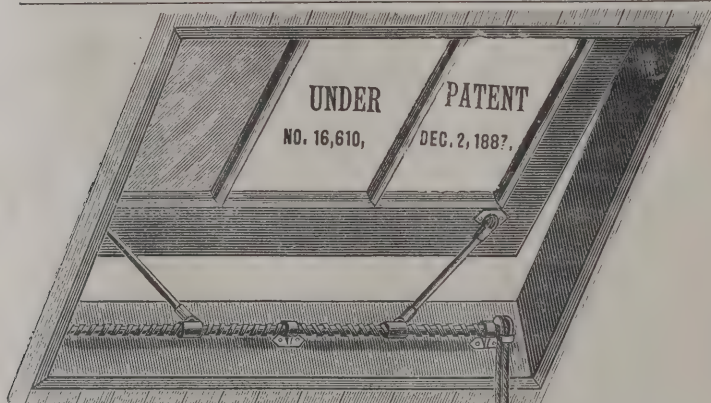
YSTRAD RHONDDA.—March 13.—For Alterations to Mardy Schools. Mr. J. Rees, Architect, Pentre.

TENDERS.

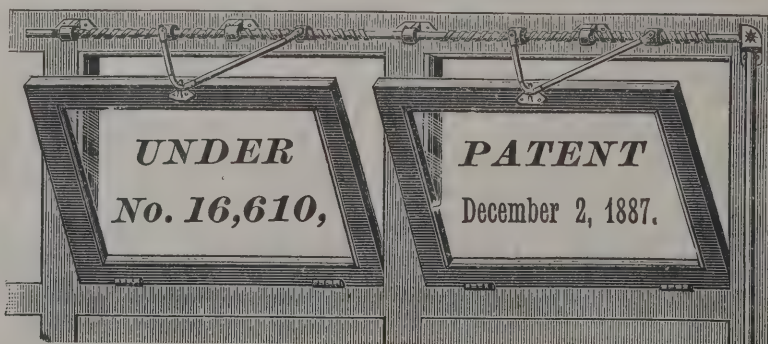
BRIGHTON.

For Building Public Baths and Works in connection, Cobden Road, Brighton. Mr. F. J. C. MAY, C.E., Architect. Quantities by the Architect.

Barber & Olliver, Brighton	£2,785	0	0
Brown & Son, Brighton	2,717	0	0
Smith, J. & Sons, Norwood	2,527	0	0
Freeman, V. P., Brighton	2,460	0	0
Taylor Bros., Hastings	2,380	0	0
Field, W. A., Brighton	2,287	0	0
LONGLEY & CO., Crawley, Sussex (accepted)	2,245	0	0
Bishop & Co., Shoreham	2,203	10	0
Neave & Neave, London	2,128	0	0



ROBT. ADAMS'S Patent Ventilating Apparatus for Continuous Sashes of Lantern Lights, Conservatories, &c. Number of Patent, 16,610, dated December 2, 1887.



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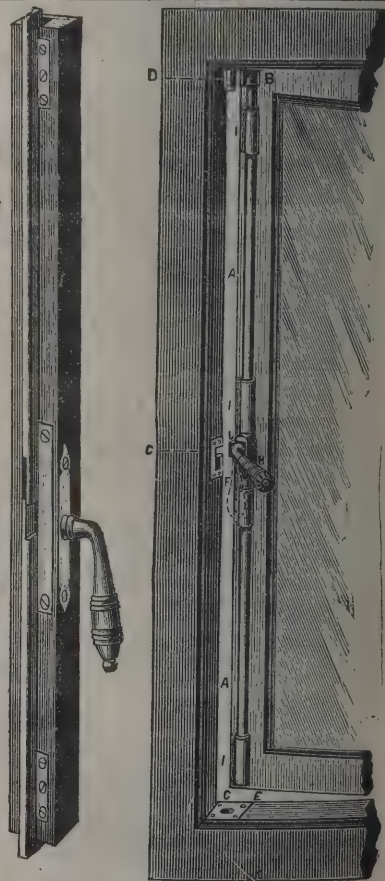
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No. 130.—New and special. Small section Weatherproof Metal-tongued Casement Bolt. Neat, strong and efficient.

No. 203.—Special thrust-motion round section Bolt suitable for very narrow stiles. It can be fixed where the space is insufficient for anything else. This Bolt is neat, strong, and reliable.

BURNLEY.

For Entrance Lodge at New Park, Ridge End, Burnley. Mr. F. S. BUTTON, Borough Surveyor.			
Smith Bros., Burnley, mason	£325	0	0
R. Simpson, Burnley, carpenter	110	7	0
J. Smith, Burnley, plumber and glazier	41	13	2
Whittaker & Schofield, Burnley, slater	39	13	0
C. Smith, Burnley, plasterer and painter	24	16	9

DARTMOUTH.

For Building Cottage Hospital, Dartmouth. Mr. E. H. BACK, C.E., M.S.A., Architect, Dartmouth.			
L. C. Pillar & Sons, Dartmouth	£1,897	10	0
Brook & Ash, Totnes	1,859	0	0
ROBERT ROW, Jun., Dartmouth (accepted)	1,799	0	0
Rabbich & Brown, Paignton	1,794	0	0
Marcus Bridgman, Paignton	1,787	0	0

ERITH.

For Building Cottage and Wards at Rear, for Infectious Diseases Hospital, Erith. Mr. HAROLD HURD, Architect.			
G. Miles, Erith	£1,000	0	0
Stickland & Chandler, Belvedere	936	15	0
J. Stoneham, Erith	910	0	0
T. H. Walden, Woolwich	810	0	0
C. Catlett, Northumberland Heath	809	0	0
G. H. GUNNING, Erith (accepted)	704	18	6

HANDSWORTH.

For Alterations and Additions to Boulton Road Schools, for the Handsworth School Board. Mr. J. R. NICHOLS, M.S.A., Architect, 59 Colmore Row, Birmingham.			
G. Squires, Aston	£2,310	0	0
J. Light, Langley	2,259	0	0
B. Whitehouse, Birmingham	2,173	0	0
R. Fenwick, Birmingham	2,155	0	0
C. A. Horton, Brierley Hill	2,100	0	0
Morris & Atkinson, Birmingham	2,100	0	0
Wm. Fisher, West Bromwich	2,095	0	0
J. Mallin, West Bromwich	2,060	0	0
M. H. Grant, Stirchley	1,963	15	0
J. Guest & Son, Brette Lane	1,950	0	0
J. Webb, Handsworth	1,925	0	0
J. Harley & Son, Smethwick	1,900	0	0
Geo. Webb, Handsworth	1,891	7	0
R. M. Hughes, Birmingham	1,861	0	0
W. Lee & Son, Birmingham	1,828	0	0
G. TRENTAM, Handsworth (accepted)	1,762	0	0

HANDSWORTH—continued.

For Warming by Low Pressure System the Boulton Road Schools for the Handsworth School Board. Mr. J. R. NICHOLS, M.S.A., Architect, 59 Colmore Row, Birmingham.			
Clements, Jeakes & Co., London	£420	0	0
Rosser & Russell, London	288	0	0
A. J. Calloway, Birmingham	211	5	0
J. Gibbs & Son, Liverpool	182	0	0
J. Jackson & Son, Birmingham	180	0	0
T. Parkes, Birmingham	167	10	0
Harlow & Sons, Macclesfield	165	0	0
J. ATTWOOD, Stourbridge (accepted)	140	0	0

EAST THURROCK.

For Additions, &c., to Orsett Union Workhouse and for Two New Hospital Pavilions at East Thurrock, Essex, for the Orsett Union and Rural Sanitary Authority. Mr. CHARLES PERTWEE, Architect, Chelmsford. Quantities supplied by Messrs. R. L. CURTIS & SONS, London Wall, E.C.

	Workhouse.	Hospitals.
F. J. Pearce, Red Lion Square	£1,492 3 0	£2,471 12 0
J. Allen & Sons, Kilburn	1,392 0 0	2,585 0 0
W. Watson, Ilford, Essex	1,375 0 0	2,286 0 0
W. H. Lorden & Sons, Upper Tooting	1,355 0 0	2,436 0 0
W. G. Rouse, Grays, Essex	1,292 0 0	2,242 0 0
H. J. Carter, Grays, Essex	1,289 0 0	2,214 0 0
Coulsell & Sons, Bethnal Green	1,273 0 0	2,173 0 0
J. Brown, Grays, Essex	1,272 5 0	2,307 3 0
H. R. Rous, Grays, Essex	1,267 0 0	2,500 0 0
Cornish & Gaymer, North Walsham, Norfolk	1,225 0 0	2,382 0 0
J. Gozzett, Maldon	1,155 12 0	2,010 0 0
J. S. Kimberley, Banbury	1,133 0 0	2,162 0 0
G. Dobson, Colchester	1,120 0 0	2,148 0 0
W. E. Letch, Braintree	1,060 0 0	2,050 0 0
T. Martin, Maidenhead	1,047 0 0	2,246 0 0
S. PARMENTER, Bocking, Braintree*	996 0 0	1,919 0 0
E. West, Chelmsford	987 0 0	1,943 0 0

* Provisionally accepted for both works.

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LONDON.

For Works of Cleaning, Painting and Sanitary Work, at South-Western Hospital, for the Metropolitan Asylums Board.

F. W. Thomas, New Cross	£1,456	10	0
Barber & Olliver, Hove	1,313	0	0
White & Son, Bow	1,208	0	0
Jones & Tresise, White Cross Street	1,154	0	0
E. Proctor, Woolwich	1,083	0	0
Vigor & Co., Poplar	1,019	10	0
W. Scott, Brixton	924	0	0
Lilly & Lilly, Whitcomb Street	917	0	0
Jemick & Crocker, Borough High Street	894	0	0
M. Batchelor, Maidstone	854	13	0
Taylor & Son, Holloway	848	0	0
Stewart & Co., Walworth	842	0	0
W & E. Mills, Westcombe Park	773	0	0
Stokes & Co., Walworth	765	0	0
AKERS & Co., South Norwood (accepted)	727	0	0

For Building Public Library, Fire Station, &c., Salisbury Road, Kilburn, for the Willesden Local Board.

	Library.	Fire Station.
A. G. Burton, Caledonian Road	£2,513	£8,375
Laurence & Sons, City Road	2,510	8,370
R. A. Yerbury, Kilburn	2,470	8,490
J. M. Goodwin, Kilburn	2,450	7,249
Scharien & Co., Brompton	2,423	8,221
R. Ballard, Child's Hill	2,347	7,810
Tennant & Co., Willesden Green	2,319	7,665
Lorden & Son, Upper Tooting	2,297	7,698
Godfrey & Son, Clapton	2,297	7,977
F. Y. Chinchin, Kensal Green	2,290	7,840
S. J. Dainton, Kilburn	2,250	7,790
W. Shepherd, Bermondsey New Road	2,235	7,677
Gould & Brand, Camden Town	2,230	7,460
Young & Lonsdale, Herne Hill	2,211	7,730
F. G. Minter, Regent's Street	2,220	8,200
Houghton & Son, Stroud Green	2,198	7,856
J. Carmichael, Wandsworth	2,158	7,542
A. Kellett, Willesden	2,150	7,112
Godson & Sons, Kilburn	2,140	5,360

LONDON—continued.

For Erecting the Rose of Denmark Beer-house, Lambeth Walk, S.E., and House adjoining, for Messrs. Truman, Hanbury, Buxton & Co., Limited. Mr. ALFRED WRIGHT, Architect, 61 Kennington Road, S.E.			
G. D. Sargeant	£2,397	0	0
Peacock Bros.	1,890	0	0
Samuel Salt	1,865	0	0
J. Tyerman	1,840	0	0
W. Johnson & Co.	1,764	0	0
Whitehead & Co.	1,690	0	0
Edwards & Medway	1,640	0	0

MONMOUTHSHIRE.

For Alterations and Additions to Itton Court, Monmouthshire. Mr. E. GUY DAWBER, Architect, 22 Buckingham Street, Adelphi. Quantities by Messrs. STONER & SONS, 8 Blomfield Street, E.C.			
Foster & Dicksee	£12,594	0	0
Holloway Bros.	12,219	0	0
Smith, Newark	11,819	7	4
Cornish & Gaymer	11,490	0	0
Estcourt & Son	11,417	0	0
Smith & Son, Norwood	11,345	0	0
Parnell & Son	11,229	11	8
Drew Bros.	10,912	14	11
COWLIN & SON (accepted)	10,194	0	0

NEW BARNET.

For Additions to Potter's Road School, New Barnet. Mr. F. CHILD, Surveyor, 1 Station Road, New Barnet, and Chancery Lane, W.C.			
Jas. Stringer, New Barnet	£132	10	0
F. J. Pearce, Red Lion Square, W.C.	128	4	0
C. E. Noble, New Barnet	120	0	0
J. Ellwood, East Barnet Road	118	0	0
John Hall, jun., New Barnet	108	0	0
Jas. W. Woodhall, Whetstone	82	8	0
W. Dudley, New Southgate	75	3	0

OXFORD.

For Building Walls and the Slating of Roof of Extension of Retort-house, and Foundations of Railway Gantry at the Works, for the Oxford Gas Company.			
T. H. Kingerlee, Oxford	£1,967	0	0
C. Bosson, Oxford	1,857	2	9
Benfield & Loxley, Oxford	1,811	15	0
WILKINS & SONS, Oxford (accepted)	1,748	0	0

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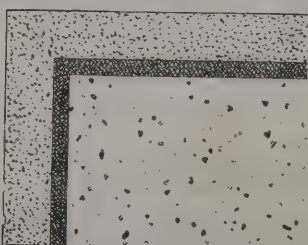
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PORT GLASGOW.

For Building Public Baths and Washhouses, Port Glasgow.	
Mr. JAMES B. STEWART, Architect, Greenock. Quantities by Messrs. BOSTON MENZIES & MORTON, Greenock.	
William Steel, Greenock, mason work	£1,533 5 1
Murdoch & Cameron, Glasgow, iron piping, washing and drying appliances, &c.	1,358 10 11
William Fyfe, Port Glasgow, carpenter and joiner work	673 0 0
William Wilson & Son, Port Glasgow, plumber work	300 16 2
P. & W. McLellan, Glasgow, ironwork	143 18 7
T. & D. Crombie, Port Glasgow, plaster work	63 1 4
Ninian J. Gillespie, Port Glasgow, slater work	57 13 10
Macfarlane & Smith, Glasgow, painter work	57 0 0
Brownlee & Co., Port Glasgow, gasfitting	54 11 4

WALSALL.

For Building Board Schools, Croft Street, Walsall. Messrs. BAILEY & MCCONNELL, Architects.	
Walton Bros., Smethwick.	£7,222 0 0
Bleakley, Birkenhead	7,127 0 0
C. A. Horton, Brierley Hill	7,100 0 0
Webb, Handsworth	7,000 0 0
Kendrick, Walsall	6,975 0 0
Willcock, Wolverhampton	6,485 0 0
Mallin, West Bromwich	6,300 0 0
Lowe & Son, Burton-on-Trent	6,232 0 0
Trentham, Birmingham	6,227 0 0
Biggs, Birmingham	6,120 0 0
Giles, Camp Hill, Birmingham	6,057 0 0
Hopkins, Birmingham	6,050 0 0
T. Tildesley, Willenhall	5,973 0 0
Lynex, Walsall	5,947 0 0
Harley & Son, Smethwick	5,890 0 0
R. M. HUGHES, Birmingham (accepted)	5,781 0 0
Guest & Son, Stourbridge	5,745 0 0

WORTHING.

For Building Relief and other Offices, Worthing, for the Guardians of East Preston Union.	
W. W. Sandell, Worthing	£641 18 0
F. Sandell, Worthing	620 0 0
J. G. King, Worthing	610 0 0
J. EAST, West Tarring, Worthing (accepted)	590 0 0
W. H. Saule, Worthing	586 0 0

WALTHAMSTOW.

For Building Board Schools, Forest Road, Walthamstow.	
Mr. W. A. LONGMORE, F.R.I.B.A., Architect, 7 Great Alie Street, E. Quantities by Messrs. GOODCHILD.	
Hart Bros., Great Dover Street	£14,767 0 0
Coxhead, Leytonstone	12,929 0 0
Richardson, Peckham	12,928 0 0
Allen & Co., Kilburn	12,865 0 0
S. J. Scott, Walthamstow	12,669 0 0
R. & E. EVANS, Peckham (accepted)	11,968 0 0
Architect's estimate	12,350 0 0

WHITLEY.

For Laying Down a Cement Promenade along Sea Banks, from Eastcliffe to East Parade, Whitley, for the Whitley and Monkseaton Local Board. Mr. W. PATTISON, Surveyor.	
G. Park, Tynemouth	£1,510 12 4
W. B. Wilkinson, Newcastle	1,352 2 3
Rule Bros., Sunderland	1,261 3 0
J. Elliot, North Shields	1,251 5 8
W. Ferguson & Son, Newcastle	1,247 17 0
G. E. Simpson, Newcastle	1,187 13 4
J. F. Bates, Whitley	1,180 16 0
J. L. Miller, Tynemouth	1,161 10 0
A. Emily, Newcastle	1,058 6 11
J. T. DOVE, Newcastle (accepted)	1,044 3 9
D. V. Purdie, North Shields	1,038 8 1
F. Mackey, South Shields	958 9 0

TRADE NOTES.

At a public meeting of owners and ratepayers of the district of the Runcorn Improvement Commissioners, a resolution was passed in favour of purchasing the undertakings of the Runcorn, Weston and Halton Waterworks Company for 67,000l.

A LARGE clock has just been erected upon the tower of the parish church, King's Norton, Worcestershire, by Messrs. John Smith & Sons, Midland Clockworks, Derby. It has been constructed generally to the designs of Lord Grimthorpe, and has all the latest improvements. It shows time on two dials each 6 feet across, chimes the Westminster quarters, and strikes the hours upon the large tenor bell. Apparatus is fitted to maintain the action of the clock during winding. The escapement is a double three-legged gravity one, and the pendulum

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ELEVENTH ANNUAL
BUILDING EXHIBITION

Of all Industries connected with the
Building Trades,
MARCH 11 to 25, 1893.

"THE ARCHITECT" says of the 1892 Exhibi-
tion:—

The representatives of all industries connected with the
building trades will be wise to commence at once their pre-
parations for the Exhibition. There cannot be as loud a pre-
liminary flourish about an Exhibition in Islington as there is
always about one of those designated as "international";
but if exhibitors will consider the results of the two classes,
they will discover that in the former they have met men of
business and received orders, while for the privilege of par-
ticipating in the universal shows they have not only lost
large sums, but discovered that the dilettanti and holiday
makers, who constitute the mass of visitors, are not fasci-
nated by the best aids to construction.

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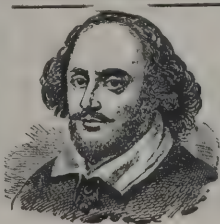
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compensated for atmospheric variations. The same firm are also making two large clocks for West Bromwich, one for Tunstall, Staffordshire, repairing the large clock at St. George's Church, Birmingham, and other works in the same neighbourhood.

WE are informed by Messrs. Le Grand & Sutcliff that, in consequence of large expansion of business, they have removed their Magdala works and offices to extensive new premises they have just erected near the City end of Bunhill Row, within four minutes walk of Moorgate Street Station.

THE Public Parks Committee of the Edinburgh Town Council have authorised estimates to be got out for new greenhouses in lieu of those displaced by the railway extension in Princes' Street Gardens, to be erected in Inverleith Park. The committee accepted the estimates of Messrs. John Morris & Sons, contractors, amounting to 1,077*l.* for the embankment and the planting of trees and shrubs in East and West Princes' Street Gardens.

TENDERS have been received by Messrs. J. P. Jones & Rowlands, architects, of Wind Street, Swansea, for pulling down premises in Temple Street, Castle Bailey Street, and Caer Street, for Messrs. Ben Evans & Co., preparatory to rebuilding as follows:—Mr. David Jenkins, Messrs. Thomas Watkins & Co., Messrs. Evans & John, Messrs. Gustavus Brothers, Messrs. Thomas Waters & Co., Mr. John Grove and Messrs. Holway & Parsons. The tender of the latter has been accepted.

It has been intimated by Messrs. Mather & Platt, of the Salford Ironworks, to their employes that they intend to try the experiment of working only forty-eight hours a week instead of fifty-three as hitherto. The experiment is to extend over twelve months, and the firm hope to be recouped to a considerable extent for the sacrifice by increased energy and greater punctuality on the part of their servants. The start before breakfast will be abolished.

THE Streets and Buildings Committee of the Edinburgh Town Council recommend the widening of the pavement in Greenside Street, and the widening of Canonmills Bridge on the south side.

At Calverley the Joint Hospital Board have accepted the tender of Messrs. D. Hinchliffe & Co. for the reconstruction of the drainage and sewage works of the fever hospital, opened two years ago, and also the tender of Mr. F. W. Higginbotham for the plumbing work.

THE contract for new harbour works at Eupatoria, in the Crimea, together with a short line of railway connecting the port with the Crimean railway system, has been given to a French syndicate.

THE following directors have been added to the London board of the London and Lancashire Fire Insurance Company:—The Marquis of Exeter and Mr. F. R. M. Phillips (Messrs. Gush, Phillips, Walters & Williams).

THE Jubilee Festival of the Iron, Hardware and Metal Trades Pension Society will be held during May. The Prince of Wales, with his customary kindness, has consented to preside, on the distinct understanding that there will be a generous support of the charity, of which the Duke of Norfolk, K.G., is president and Mr. Howard J. Kennard vice-president.

ELECTRICAL.

THE Gas Committee of the Leicester Corporation recommend the Council to accept a tender of the Brush Company to introduce an installation of the electric light into Leicester at a cost of 27,000*l.*, and to borrow 50,000*l.* to erect the necessary buildings and provide working capital.

It is proposed to have the new free library at Southampton lighted by electricity, the cost of which has been estimated at about 400*l.*

BUILDING AND BUILDERS.

THE Leeds County Council have authorised a grant of 2,000*l.* for the erection of a caretaker's house, with store-room, cooking kitchen, washing and drying houses, including fittings, to be used for sanatorium purposes at Manston, and a grant of 3,000*l.* for the erection of a smallpox hospital on the Manston Hall Estate capable of accommodating about twenty-five patients.

THE contract for the Croydon Municipal Buildings has been awarded to Messrs. W. H. Lascelles & Co., the amount being about 61,793*l.*

THE Oxford Town Council have accepted the tender of Mr. John T. Chappell, at 51,663*l.*, for the municipal buildings, which was the lowest on the list. The second lowest, 53,852*l.*, was from Mr. S. Hutchins; the highest tender, from a Plymouth builder, being 71,414*l.* The total cost is estimated as follows:—Tender, 51,380*l.*; commissions, 5,203*l.*; heating and carving, 5,000*l.*; fittings, 4,300*l.*, or a total of 65,883*l.*

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A COMPANY has been formed to purchase a city office property in Johannesburg, Transvaal, known as "Green's Chambers," situate in the centre of Johannesburg, for the purpose of erecting the Johannesburg Safe Deposit Company's buildings. The intention is to pull down the present building of iron and wood, which is quite obsolete in style, totally unsuited to its excellent business surroundings and unrivalled situation, and to erect immediately a handsome building of permanent material two or three storeys in height, similar to the commercial buildings on each side of it. As there is a pressing demand for the establishment of a safe deposit in Johannesburg, estimates have been obtained from Messrs. Ratcliff & Horner, Limited, who have had similar contracts in other cities, and are at present constructing the Edinburgh Safe Deposit, the New London Safe Deposit, and a duplication of the Chancery Lane Safe Deposit, and it has been decided to utilise the basement of the property for this purpose. The area thus set aside will allow sufficient room for the construction of 2,000 steel fire-proof and thief-proof safes of varying sizes, and strong rooms for the use of merchants, bankers and others. The managing director of the company has just left for Johannesburg, and Mr. G. Lennox Canning, the architect, is also on the point of departure. The capital has been over and above subscribed.

CHICAGO EXHIBITION NOTES.

AN interesting exhibit at the World's Fair will be a model of the island of St. Thomas, Danish West Indies. It is about 8 feet by 4, built to a scale of 6 inches to the mile, painted in natural colours, showing the roads, country houses, ships and steamers in the harbour and the pretty town of Charlotte Amalin, with its two old legendary towers of Blackbeard and Bluebeard.

THE flag carried by Pizarro and his followers during the conquest of Peru will be a notable object in the Venezuelan exhibit at the World's Fair. The sword of Cortez will be exhibited from Mexico.

HAYTI'S building at the World's Fair, a unique and artistic structure, has been completed, and was dedicated on January 2, the anniversary of the independence of Hayti.

GOUPIL & Co., of New York and Paris, have been conceded the important privilege of making an illustrated publication of the contents of the Woman's Building.

THE inter-continental railway commission has had prepared a facsimile in miniature of Central and South America, to show the surveys of the proposed railroad intended to unite the systems of North and South America. The work was done by Mr. E. E. Court, of the Hydrographic Office.

THE Great Western Railway Company are sending out to Chicago their famous old broad-gauge engine "Lord of the Isles," which was exhibited in the London Exhibition of 1861 and the Edinburgh Exhibition of 1890.

THE firm of shipbuilders, Messrs. Laird Brothers, Birkenhead, despatch to Chicago a number of models intended for exhibition in the British section of the World's Fair. These will include specimens showing the development of the ship-building trade, among them being models of some of the present-day Atlantic liners and other famous vessels built by the firm.

THE municipal authorities at Copenhagen have decided to send Tuxen's picture of the Danish Royal Family to Chicago to be exhibited at the World's Fair.

BAIRD, THOMPSON & CO.

A SHORT time ago we referred to the additions and re-arrangement of the staff of this firm, and now, in order to cope with the increasing demand for their well known systems of ventilation, &c., and specialties, and continue to give each individual order their usual prompt attention, they have found it necessary to remove their offices and show-rooms to larger and more commodious premises. They have, therefore, secured the handsome premises situate at 159 Queen Victoria Street, E.C. (two doors east of those lately occupied by them). These are being fitted up with every modern improvement in ventilation, heating, sanitation, &c., including a splendid installation of electric light, generated by themselves—a 2,000-power arc lamp lighting the outside, power for which is supplied by one of Messrs. Robey & Co.'s, Lincoln, latest improved type of gas-engine, in working order, to allow their numerous clients and visitors to examine and judge for themselves which special system or specialty will be most suitable for their requirements. The rapid strides this firm have made of late years are almost phenomenal in connection with the science of ventilation and sanitary engineering. We wish them success in their new enterprise, and congratulate them on the circumstances which have led to it. The new show-rooms are well worth a visit.

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VARIETIES.

AFTER a lengthened respite another landslip has occurred in the Yorkshire fishing-town at Robin's Hood Bay from the precipitous cliff, injuring two houses. Further subsidences will jeopardise the safety of the Wesleyan Chapel. The town is one of the quaintest on the coast, the houses and other buildings being fantastically perched in considerable part along the cliffs.

At the meeting of the Watch Committee of the Liverpool City Council a deputation attended and urged upon the committee the necessity of some efficient measures being taken for the early extinction of fires. It was recommended that more extensive fire appliances should be provided, and also an increased number of stations should be erected at convenient points throughout the city.

THE *Leeds Mercury* says that the Asylum Committee of the Middlesbrough Corporation have agreed, subject to the approval of the Lunacy Commissioners, to purchase from the trustees of the late Mr. H. Bolckow 106 acres of land for the sum of 10,000*l.*, or at the rate of 94*l.* 13*s.* per acre.

THE Polytechnic Young Men's Christian Institute, Regent Street, have arranged for "co-operative excursions" to the Chicago exhibition and also to the Norwegian Fjords during the months of May, June and July. The excursions are arranged for those of limited means who otherwise would be unable to take advantage of either excursion.

THE Gainsborough Local Board have resolved to apply to Mr. Jabez Church, C.E., Westminster, to carry out the work of deepening the bore at the artesian well, and enlarging the well itself. The estimated expense is 8,000*l.*, but as a new engine-house will have to be built and other matters carried out, it was decided to apply for powers to borrow 10,000*l.*

ON Wednesday Sir Henry Trueman Wood, secretary of the Royal Commission for the Chicago exhibition, sailed for America by the *City of Paris*, to take charge of the British section at Chicago, where he may be expected to arrive about March 6.

At the meeting of the Manchester Association of Students of the Institution of Civil Engineers, Mr. W. Cooper read a paper on the "Practical carrying out of Main Drainage Works," Mr. L. B. Wells, president of the Association, in the chair. Mr. Cooper described the setting out of the works, and the methods of sinking and timbering the shafts. He explained

the mode of excavating sewers under varying conditions, and how the headings were driven and timbered. He also showed how the brickwork was built and the sewer completed.

THE second annual report of the Yorkshire Sanitary Association has been issued, showing a record of what has been attempted during the year, in aid of improving sanitary conditions. The danger of relying upon filters as an absolutely safe precaution against the impurities in water are pointed out, and it is strongly recommended that where sources of undoubted purity are available, the water from them should be used without allowing it to pass through any cistern or filter.

A STEAMER intended for the Great Eastern Railway Company's Harwich Continental Service was launched from Messrs. Earle's Yard at Hull, on Tuesday, February 21. This vessel is a steel twin-screw steamer 300 feet in length by 34½ feet beam, fitted with two separate sets of triple compound engines, which are expected to develop 4,500 horse-power, the builders having guaranteed a speed, when fully loaded with passengers and cargo, of 17½ knots per hour. The christening ceremony was performed by the Mayoress of Chelmsford, the vessel being named after that town. She is fitted with all the latest improvements for about two hundred first-class passengers, and is intended for the new route to the Continent from Harwich *via* the Hook of Holland, which is expected to be opened on June 1 next.

At the meeting of the Glasgow Association of Students of the Institution of Civil Engineers, Mr. John Cowan, jun., vice-president, in the chair, a paper was read by Mr. H. C. Lobnitz, student, on "Long Shoot Dredgers: their Design and Mode of Working."

AN inquiry has been held by the Local Government Board at Bradford relative to a proposal to borrow 100,000*l.*, mainly for sewage and electric lighting purposes.

At Smethwick inquiry has just been held by the Local Government Board respecting an application made by the Local Board for sanction to borrow 20,000*l.* for sewerage works and 3,070*l.* for works of street improvement. The Local Board has already carried out a considerable portion of the sewerage scheme, and spent 27,000*l.* on the work. The estimated cost of the proposed works is 19,975*l.*

THE Corporate Property Committee of the Leeds Corporation have decided to purchase a large field adjoining Kirkstall Abbey for the purpose of extending the grounds.

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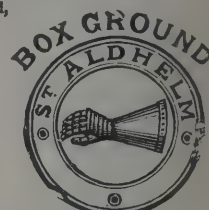
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ALBERT WORKS, ALBERT EMBANKMENT, LONDON, S.E.

STRENGTH OF CONCRETE.

THE paper which was read before the Society of Architects by Mr. H. W. Chubb referred to the use of concrete as a material in building fireproof structures. The specimens of concrete which Mr. Chubb mentioned as having been tested by Mr. J. J. Webster, M.I.C.E., had been specially prepared. The following table shows their composition, together with the results which were obtained :—

Nature and proportions of materials in Concrete Briquettes.	Average weight per cubic foot.	Breaking weight per square inch at 60 deg. F.	Breaking weight per square inch after being heated and quenched.	Average loss per cent. of original strength after heating and quenching.
Neat Portland cement	lbs. 124·6	lbs. 554·6	lbs. 117·2	per cent. 60·8
1 part cement, 1 part sand	120·9	448·0	93·0	80·0
1 " 3 parts sand	111·2	100·8	18·7	81·4
1 " 5 " " "	109·7	74·6	15·0	79·8
1 " 4 " iron furnace slag	163·08	108·1	23·06	69·3
1 part cement, 1 part pumice stone	64·8	94·58	38·3	59·5
1 " 4 parts broken firebrick	95·04	84·4	30·5	50·9
1 part cement, 4 parts coke breeze	71·65	69·9	39·06	57·1
1 " plaster-of-Paris, 4 parts broken firebrick	89·6	66·8	10·3	75·0
1 part plaster-of-Paris, 4 parts pumice stone	55·6	57·4	3·4	94·7
1 part plaster-of-Paris, 2 parts furnace slag	148·0	223·3	6·9	96·8
1 part plaster-of-Paris, 2 parts broken firebrick	106·9	167·5	15·7	90·0

THE EARTHQUAKE IN ZANTE.

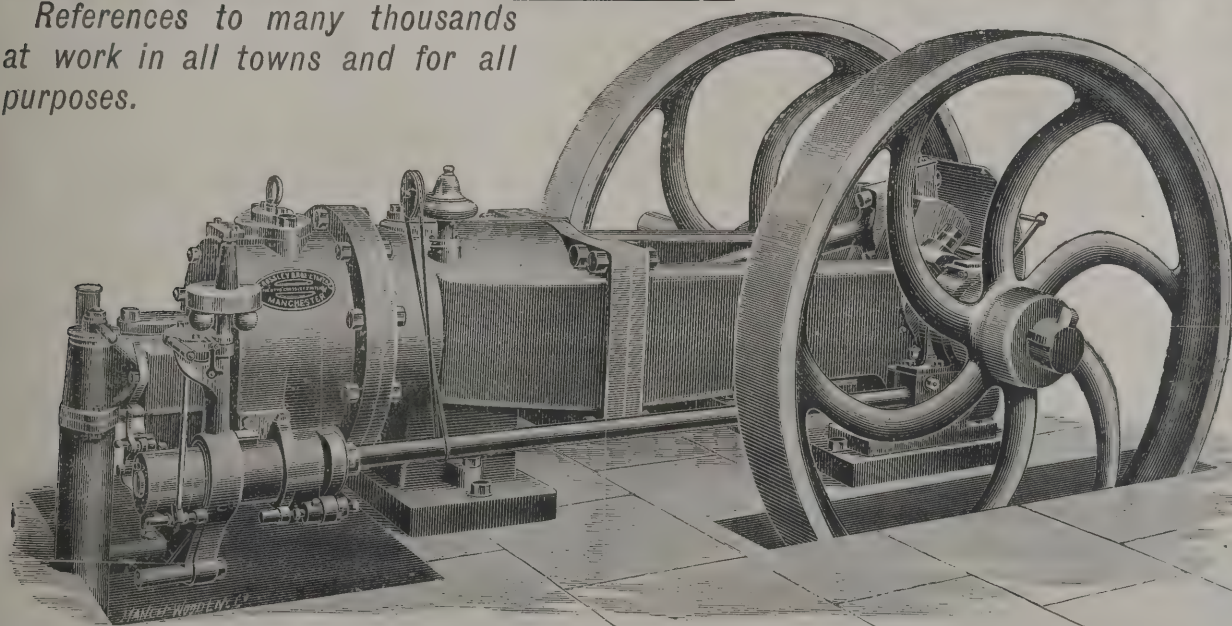
A SPECIAL correspondent of the *Times*, in describing the effects of the late earthquake at Zante, says :—The extent of the recent disaster can hardly be realised at once, and the visitor,

as he steps ashore at the landing-place in the harbour, is inclined to think that the accounts which have reached him must have been exaggerated. He sees the large buildings around him standing apparently uninjured ; he notes that the plaster has in many places fallen from the walls, but this might be the result of neglect. It is not until he begins a thorough investigation that he comes to understand what a terrible catastrophe has taken place. The larger houses, owing to their greater weight and solidity of construction, have suffered least, but not one of them has escaped without damage of some kind. Leaking roofs, cracked and gaping partition-walls and fallen ceilings, are to be found in mansions which still present a tolerably fair exterior. The appearance of the streets in the better part of the town is quite delusive. The street fronts of the houses, built on arches in Italian fashion and recalling memories of Bologna, are almost intact, owing to their strong construction, while the walls on the other sides and the roofs have either fallen or are in a ruinous condition. The greatest devastation has taken place in the poorer quarter of the town, where the ill-constructed buildings were unable to resist the repeated shocks, and fell in such total ruin that in many cases nothing now meets the eye but heaps of stones, rafters and broken tiles. It is touching to see how the unfortunate people still cling to the remnants of their abodes—to see a family still living in the corner of a cottage, the rest of which has been reduced to ruins, or to stand by the bedside of the sick in some miserable hovel, where the gaping roof and walls admit the bitter wind and the rain.

A visit to the country district conveys a still more striking impression. The beautiful and fertile region which lies between the eastern coast and the mountains which form the backbone of the island is densely populated, and numerous country houses and peasants' cottages peeping out amid the foliage bear witness to the well-being and prosperity of the inhabitants. Here again the larger houses, which for the most part belong to wealthy townsfolk, have resisted the shocks of earthquake, but the peasants' cottages are almost all in ruins. Not far from the foot of the mountain lies the larger village of Macherato, with a population of 200 families. Here, according to the statements of the mayor and others, only six houses remain inhabitable. Of the two large churches, one has suffered severely ; the other, a new and strongly-built structure, has escaped fairly ; in both cases, as in the town of Zante and elsewhere, the steeples and belfries remain uninjured. Only one of the numerous steeples in the capital has received damage,

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while several churches have fallen in. Fortunately the Zakyntians, unlike the inhabitants of the Riviera, are not given to seeking refuge in their churches in times of earthquake.

The village of Buyato, which lies in the same district, has suffered even more severely than Macherato. Not half a dozen houses remain fit for habitation, and in many places there is nothing more than a heap of stones to indicate where a peasant's cottage formerly stood. I learned from the villagers that the first shock of earthquake did less damage here than the second, though the former was elsewhere felt to be the most severe. In other villages the devastation, though less apparent, was hardly less real. At San Dimitri, a village of 110 families, I was informed that only two houses remain fit for habitation. At Skulikato, a charming little town standing in the midst of orange and lemon groves, only three houses, so it was stated, remain intact. Here a curious disaster happened to the church steeple, which was topped with a large iron cross. The cross fell, bringing with it some 3 or 4 feet of the masonry, but the rest of the steeple stood uninjured.

From these examples, which are typical of what has occurred all over the island, the reader may form some idea of the magnitude of the calamity which has befallen unhappy Zante. Only one village, Galaro, which lies among the higher mountains, has escaped the prevailing devastation. The total loss of property is estimated by experienced observers to exceed 600,000*l*.

BRAY ELECTRIC LIGHTING.

A PORTABLE telescopic ladder, made for use in connection with the electric lighting of Bray (Ireland) public streets, has been designed and constructed by the well known patent extension ladder makers, J. H. Heathman & Co., 2 and 37 Endell Street, London, W.C., and telescopes from 18 feet to 33 feet, having a platform at top upon which the lamp-trimmer sits, and grapnel-hooks are affixed to take over the arms on the lamp-pillars. The whole is mounted upon a four-wheeled carriage, and a spacious tool-box is provided. It was made to be drawn and used by one man, but the distance of 1½ miles having to be covered to control the whole of the lamps it was found desirable to affix shafts for draught at quick pace by a pony. The sliding-ladder is raised by means of a rope over a pulley, and it can be arrested at any rung, so that it suits lamps of varying heights.

UNION OF CAPITAL AND LABOUR INTERESTS.

THE *Oldham Chronicle* says:—On Saturday afternoon a visit was paid to Falcon Ironworks, Ashton Road, Oldham; the extensive machinery works of Messrs. John Wild & Co., Limited. Leaving the offices, the party first visited the machine erecting room on the ground floor, which was found to be well arranged, and containing some of the latest patents of machines in course of erection. The first one viewed was one of Fairbairn's patent screw rolling machines, specially designed for making screws for wood such as railway sleepers. This machine, when completed, will be sent to Russia. The second was a portable hauling and winding machine, designed for underground work, such as collieries, &c., and one made to withstand rough work. These are so simple that they can be fixed and handled by unskilled workmen, and moved about the mine. A large number of these machines are at present working in the South Wales collieries. A horizontal boring machine was also viewed with great interest. Here were two large cranes used for lifting machines on the luries prior to being delivered. The next room visited was the pattern store-room, which contained patterns of all descriptions. On leaving this place the visitors inspected the room in which machines for wood cutting and planing are made. Here an improved hand power feed planing machine was seen. There were seen quite a large number of different kinds of machines for wood-work being erected, such as double panel planing machines, side planing machines, wood boring machines, all suitable for joiners and cabinet makers. The horizontal board cutting-machine, specially designed for cutting up valuable wood, such as walnut, mahogany, &c. Only one board is cut at once from the log, thereby allowing the workman to see the full development of the grain as the timber is being sawn. A machine which is in great demand is the band saw machine. This machine is fitted with improved pulleys of cycle pattern, and are accurately balanced, and have their rims covered with indiarubber, so as to form an elastic bed for the saw. A great feature of this machine is that no screw-keys are required. The visitors were also shown two patent governors that had been on view at the Midlands Ironworks Exhibition. Instead of the central weight a spiral spring is employed, and as the valve lowers the spring is compressed. The next room visited was the pattern room, and we may here say that the directors intend building a foundry of their own to do their own castings. The visit throughout was both enjoyable and instructive. The same afternoon the workmen of the Falcon Ironworks, along with their wives and

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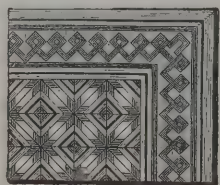
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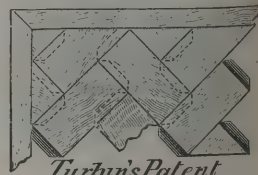
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sweethearts, to the number of 112, were invited by the directors to spend a social evening at the Conservative Club, Greengate Street. After a substantial tea had been partaken of, a concert was held.

Mr. John Wild occupied the chair, and in his remarks said he was pleased to be present amongst them at that, their fourth annual gathering, and he hoped he would have the pleasure of being present at the forty-fourth. They had been busy at the works considering the prevailing trade dispute. They must bring out good work, and at the same time do it cheaply. What the directors desired to do was to get a reputation for good work, and without the assistance of the workpeople they could not get a dividend. He concluded with hoping they would all spend a pleasant evening.

Mr. J. H. Fisher said as a co-director he gave them all a hearty welcome. That was the fourth gathering at which he had been present, and he hoped they would all continue to work in the interests of the company.

Mr. J. S. Hulton said the thing that came uppermost to most of their minds at the present time was the unhappy struggle now being waged. He was afraid that a dispute between capital and labour was like a quarrel between husband and wife, and when the end came—and come it must—there would be searchings of heart on both sides. They all knew how difficult, and even dangerous, it was to interpose between man and wife, and although attempts at mediation had been made in high places in the present instance, they had proved equally perilous and futile. That the struggle was a costly one no one doubted, for it had already cost the operatives a sum of about 100,000%, but what it had cost the employers it was very difficult to estimate. To take sides on an occasion like this would be in very bad taste. The question of wages, or what was a fair day's wage for a fair day's work, bristled with difficulties, but when next the operatives had another 100,000% to spare he would like to see them build a mill of the most modern type, equipped with the best machinery that skill or ingenuity could devise. Then let them pick out their best workpeople and their best managers. Let them send their salesmen in the open market for orders, and without any speculation in the raw material, buying cotton only to cover their orders; and, as a result, let us see what remuneration they have for their capital. Those of them who were mere onlookers would then be able to form a more accurate judgment upon the question of wages in this particular branch of trade. Whilst he was not prepared to say that the

workpeople were unreasonable, on the other hand he knew that the "cotton lord" of to-day was far from avaricious, for what with foreign competition and the still more fierce competition at home, he was now contented with a fair remuneration upon the capital he employed; nay, in many cases, both the iron-master and the cotton-master received but a meagre return upon their outlay.

Mr. Wm. Williams moved, and Mr. Wm. Fletcher seconded, a vote of thanks to the chairman and directors.

During the evening songs were given by Miss Stringfellow, Mrs. Thornley, Mr. Crompton, Mr. Barlew, Mr. Needham, Mr. S. Milner and Master Broadbent, in a very creditable manner. Two recitations were given by Mr. Bradley in a pleasing style. Well rendered glees were given by the Oldham Central Glee Union.

WATER SUPPLY OF FLORENCE.

THE special commission nominated by the City Council to find a supply of pure spring water for Florence have terminated their labours, the result of which is embodied in an exhaustive report. The city would give to a properly-constituted company or syndicate offering substantial guarantees the right of supplying water to the inhabitants of the town for sixty years. The sum which would be required to carry out the works is 25 million lire, or, in round numbers, a little less, counting exchange, than a million sterling. The water rates now produce to the city an annual profit of 300,000 francs, but the present quantity is insufficient to satisfy the requirements of the whole population, and it is estimated that with an abundant supply of water the present consumption would be more than quadrupled. The city authorities would compel all the present wells of the town to be closed, and thus force the population of the whole commune to use the projected water supply for every purpose. It has been decided that all the waters should come from one source or group of springs, in order to maintain an unvaried quantity and quality. In the Garfagnana region, some distance beyond the baths of Lucca, there is a spring of water called the Pollaccia, of a delicious, limpid quality. The water has been analysed and found to be chemically pure. The surroundings, too, are good, the sources of the spring being at a good altitude, in a rocky, mountainous region, almost bare of vegetation and free from any possible source of organic contagion. The necessary quantity and quality of "excessively pure" water having thus been assured in the Garfagnana, where one spring has already been purchased, the commission recom-

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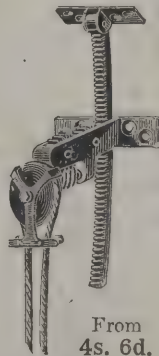
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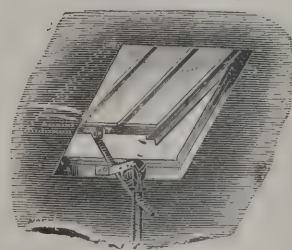
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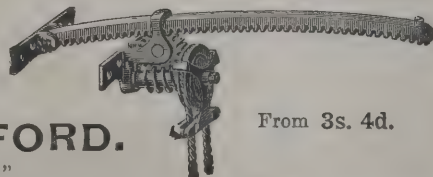
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mend the following project:—To bring the water from two separate springs which united would give 600 litres per inch, and to add a third when 900 litres are required. The aqueduct would start from Pollaccia, at 550 mètres above sea level, and join the springs of Gangheri at 255 mètres above sea level. It would then pass through various tunnels and cross several rivers by double syphons, and skirt the edges of mountains above Pescia, Pistoia, Prato and Sesto to S. Silvestro, above Florence, 212 mètres above sea level, where a reservoir to contain 40,000 cubic mètres would be built. Total length, 103,245 mètres, at an estimated cost of 18,000,000 lire. The sanitary reforms that will be the logical sequence of these improvements in the water-supply, which will carry water not only to the town but to the villas on the hills in its vicinity, will render Florence more attractive than ever, and will doubtless reduce the already diminishing death-rate.

BUILDING REGULATIONS IN LEEDS.

A DEPUTATION from the Leeds Building Trades' Exchange and the Leeds and District Property-owners' Association interviewed the Streets and Sewerage Committee with reference to certain provisions in the new Consolidation Bill. The first question touched upon was the width of streets. The Bill provides that the minimum width shall be 14 yards. The deputation proposed as an alternative that the street should be 16 yards from wall to wall, but that they should be allowed to leave two yards of garden space on either side of the street, thus limiting the paving line to 12 yards. It was pointed out that while this would reduce the cost of paving and flagging, it would in reality give a wider thoroughfare and more space for ventilation. With reference to the clause which provides that at the intersection of all streets there shall be a radius of not less than 20 feet, the deputation urged that this was impracticable, and was informed by the committee that the provision would be expunged. The next question discussed had reference to the regulation of the Building Clauses Committee which requires a street to be filled up and levelled before the main drain can be laid, or before building operations can be proceeded with. One result of this, according to the spokesman of the deputation, is that after carting soil for the purpose of levelling up a street, builders would have to cart away the soil which was obtained from the excavations carried out in connection with the buildings, and might otherwise be used for the purpose of levelling the street.

They, therefore, asked that the prohibition of the committee should not extend to the erection of any building up to the basement floor, or to any building below the intended level of the street; and further, that the builder should be allowed to put down the main sewer if three feet of covering over the pipes existed or was provided, and to put in the kerbs and gullies after the street was levelled up. The latter arrangement, it was explained, would prevent gullies being placed opposite the doors of the dwellings. The time for appeal against a notice of the Corporation to pave and flag is at present four months. The new Bill proposes to make it seven days, and the deputation asked that it should be made three months. The committee agreed to extend the period to two months. It is also proposed in the new Bill to throw the expense of renumbering of streets on to the owner of the property, and the deputation asked the committee to reconsider the proposal. Another clause gives the Corporation power to remove projections into streets, and only allows compensation for those which have existed since 1824. The deputation asked that compensation should be allowed for all projections which are removed if they have existed for twenty years and upwards. The committee replied that they were already enabled, under common law, to act as was proposed, both with reference to the numbering and renumbering of streets and the removal of projections. They promised to give the other points brought forward by the deputation, and not disposed of, their careful consideration.

REGISTRATION OF PLUMBERS.

A CONFERENCE of Sanitary Authorities of Great Britain and Ireland has just been held at the Mansion House, London, under the presidency of the Lord Mayor. Delegates attended in considerable numbers from various parts of England, Scotland and Ireland. Those present from Scotland included Dr. Littlejohn, medical officer of health, Edinburgh, and president-elect of the British Institute of Public Health; Dr. J. B. Russell, medical officer of health, Glasgow; Dr. Eben. Duncan and Mr. D. M. Alexander, president and secretary of the Sanitary Association of Scotland; Dr. Farquharson, M.P.; Councillor Crawford, chairman of the Committee of Public Health of Glasgow; and Councillor Dick, chairman of the Hospitals Committee of the Town Council of Glasgow. During a short interval of absence of the Lord Mayor, Councillor Crawford presided.

Dr. Littlejohn, Edinburgh, complimented Mr. Crawford, as



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chairman of the Public Health Committee of Glasgow, on the important services which he had rendered to sanitation in Glasgow, and said no better chairman, in the temporary absence of the Lord Mayor, could have been found than Mr. Crawford. He had always regarded the sanitary inspector as the right-hand of the medical officer of health. What they had met there that day to do was to do their best to see that this right-hand man was not only an intelligent man, but a thoroughly-trained man, secured by examination, and testified to by diploma.

The following resolutions were passed by the conference :—

"That this conference of delegated representatives of the sanitary authorities of Great Britain and Ireland, held at the Mansion House, London, February 18, 1893, having considered the provision of the Public Health (London) Act, 1891, requiring that every sanitary inspector appointed after 1895, except in the case of those specified therein, 'shall be holder of a certificate showing that he has by examination shown himself competent for such office,' is of opinion (1) that this new enactment is calculated to afford an important additional safeguard to the public health; (2) that it should be extended to the Health Acts applicable to the United Kingdom generally; (3) that a central board of examiners should be formed to conduct the necessary examinations and grant certificates in connection therewith; and (4) that the constitution of the board of examiners should be subject to the approval of the Local Government Board in England and Wales, the Local Government Board in Ireland for Ireland, and the Board of Supervision in Scotland." "That this congress of delegates, representatives of the sanitary authorities of Great Britain and Ireland, held at the Mansion House on February 18, 1893, is desirous of recording its opinion that the systematic training, examination and registration of plumbers is essential to the protection of the public health, and that a statement embodying this opinion should be presented as a memorial to Parliament, coupled with the expression of the further opinion that the Plumbers' Registration Bill, now before Parliament, should be passed into law at the earliest opportunity in the interest of the public health." "That it should be compulsory on local authorities, either separately or in conjunction with neighbouring health authorities, to provide such accommodation for isolation and treatment of infectious diseases as shall be satisfactory to the central health authorities, the Local Government Board in England and Wales, the Local Government Board for Ireland in Ireland, and the Board of Supervision in Scotland." "That with the

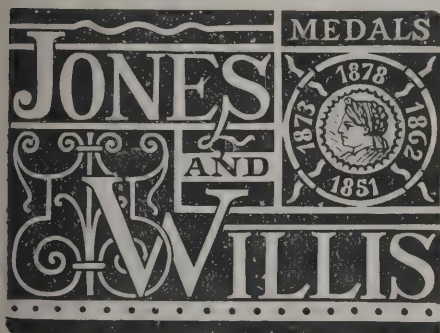
view of carrying out the resolution with greater efficiency, power should be given to the authorities herein described compulsorily to acquire the necessary sites." "That copies of the several resolutions passed at this conference of delegated representatives of the sanitary authorities of Great Britain and Ireland shall be embodied in suitable form for transmission to the various Departments of State dealing with public health matters, and also to the chairmen of the various sanitary authorities in Great Britain and Ireland, under the signature of the Lord Mayor of London as president of the conference."

SICK FUNDS FOR BUILDING WORKMEN.

A CASE which was heard before Mr. Shiel at the Westminster Police Court, on Tuesday, should be taken as a warning by builders and other contractors who are eager to aid their workmen when in illness or in other difficulties. Messrs. Castle & Sons, of Millbank, were summoned by a labourer who had been in their employment for a breach of the Truck Act. When the case was first before the magistrate the complainant stated that when he entered the defendants' service as a mason's labourer there was no stipulation about deduction from his wages. The defendants deducted 6d. a week from his pay as a subscription on his part to the sickness and accident fund which they had established for their men. Another workman, however, swore that no deduction was made by the firm, that the fund was formed and conducted by the men, that they were paid in full, and that the weekly subscription was voluntarily made by the men, though the pay clerk received the money.

The pay clerk said that he paid all the men weekly, according to the number of hours worked, without deductions. He afterwards, by the wish of the men, took 6d. from each man's wages for the sick fund. He handed the 6d. to the secretary of the fund, who was one of the workmen and was elected by the workmen. The firm had nothing to do with the fund. Each workman had a numbered box in which his wages were placed. Witness took 6d. from each box for the club before the workmen took their wages. Practically the deduction was made before the men saw their money, but it was made by their wish. The complainant had tacitly agreed to the system by making no complaint during the five years he had been in the employ of the firm.

An office messenger in the service of the defendants deposed that he had been a member of the sick club since its formation, and was now secretary. It was started by the men.



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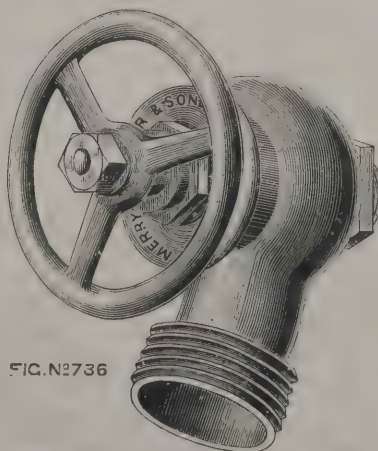


FIG. N°736

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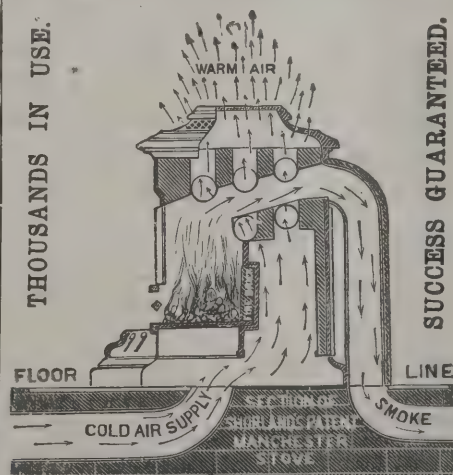
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The deducted 6d. was divided, 4d. being the subscription to a sick fund and 2d. to an accident fund. The accident fund was administered by the firm, which had to make up constant deficits, the fund being unequal to the claims upon it.

Mr. Sheil: Are the men obliged to belong to the club?

Witness: Well, they are supposed to belong to it.

Mr. Sheil: Then I think that brings it within the Truck Act.

Mr. Castle: They are not obliged. It is mentioned to them that there is a club, but a man would not be refused employment if he refused to join. There are twelve men in the service of the firm who do not belong to the club.

Mr. Sheil said that if the men were paid in full, or if the pay clerk was their agent and was paid in full, it did not matter what they might afterwards voluntarily do with the money. The question therefore was whether this was a deduction by the pay clerk as the agent of the employer or a payment by the pay clerk as the agent of the men. Mr. Sheil then recalled the secretary, and asked whether he had any minute or resolution of the appointment of the pay clerk to deduct the 6d. on the men's behalf.

The witness admitted that there had been no formal appointment. He said it had been the general wish that the pay clerk should receive the sixpences because that was the most convenient course.

Mr. Sheil: Then I do not think it can be made out that he was the men's agent, and I must impose a fine of 1s. and 2s. costs.

It was pointed out that the 9th section of the Act authorised a fine of 10l. on first conviction.

Mr. Sheil: Of course, if the law is broken again it will be quite a different thing.

THE USE OF STEEL FOR CONSTRUCTIVE PURPOSES.*

(Concluded from last week.)

Roof over Hengler's Circus, Argyle Street, London.

Mr. C. J. Phipps, Architect.

This was constructed wholly of steel in the year 1883. It is conical in section and is supported on 16 columns, the centres of these being 82 feet 4 inches apart. In plan it is a polygon of 16 sides. There are 16 braced ribs supported on 16 lattice girders 10 feet deep, forming the sides of the polygon.

* A paper read by Mr. Richard Moreland, M.Inst.C.E., M.Inst.M.E., at a meeting of the Society of Architects.

There is a central cylinder of steel, 6 feet diameter inside and 13 feet 6 inches in length, with flanges top and bottom to which the upper and lower members of each of the lattice girders are connected.

The columns are 10 inches in diameter, $1\frac{1}{4}$ metal, 2 feet 6 inches square bases, a total height of 28 feet 6 inches. Brackets 3 feet in length are constructed at a height of 18 feet 6 inches, and these form support to the floors and galleries, and the construction of these tend to give the column additional lateral support. The ends of the lattice girders rest on tops of columns, these are 16 feet long, 10 feet deep, the flanges made of 5 by 5 by $\frac{1}{2}$ T steel with a 10 by $\frac{1}{2}$ rivetted on the label of the T. There are two sets of bracing dividing the girders into two parts, the struts are 4 by 3 by $\frac{1}{2}$ T steel and ties 4 by $\frac{1}{2}$ flat steel. An additional tie at each end is placed to divide the lower flange into four divisions, to support timbering and girders for roof which is supported by it. The ends of the girders have end plates set at an angle to fit the polygon, and these are securely jointed and bolted together as well as to the caps of the columns, and so form an effectual tie and support for the main braces of the roof. The lattice girders serve to support an external construction forming portion of the structure, and spaces between the lattices are used for window openings. On the top and over each column is fixed the braced steel roof ribs. These are 43 feet 6 inches long, 13 feet 3 inches deep at cylinder at centre, and 1 foot 6 inches deep at ends.

The flanges are of T steel section 5 by 5 by $\frac{1}{2}$ of Butterley steel rolled in one length. The lower flange is curved and is so constructed as to produce a rise of 8 feet from the top of lattice girders to the underside of centre cylinder. The braces are of 4 by 3 by $\frac{1}{2}$ T steel, and 4 by $\frac{1}{2}$ flat buds alternating, with the exception of the three last at the column ends, the last or the first brace over the column being formed of 24 by 4 by $\frac{1}{2}$ steel angles. The ends 13'3" deep, fit and are securely jointed and erected to the upper and lower flange of the cylinder, 6'0" diameter of $\frac{1}{4}$ -inch steel plate with 6 by 6 by $\frac{1}{2}$ steel angles, and 9 by $\frac{1}{2}$ bent to a circle. The roof was constructed to support slates, and the lower flanges of braced ribs supported the construction of the ceiling. The cylinder in centre was used as a ventilator of a sun burner and for the building. The ring of lattice girders connected together form an effectual resistance to the thrust of the roof ribs, although the roof ribs, connected to the cylinder as they are, form a sufficiently rigid structure by themselves to support the roof and ceiling, and their own

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weight, but the element of the tie at the base of the roof braces adds very considerably to the strength and stability of the structure. The mode of construction suggested at once the method of erection, and this was done in a very simple way. The top of the cylinder being 60 feet from the ground, an 80-foot derrick pole, 15 inches square, was set up inside the cylinder, which was set up on end on the ground, the derrick being properly bedded and guyed with its lifting tackle on the top.

The columns and lattice girders being previously erected by a smaller derrick, the cylinder was then hoisted into position and fixed securely by cross timbers fixed under it and on the derrick. The roof ribs were then hoisted into their position one by one by another derrick, and secured to the cylinder and ring of lattice girders, and when they were all hoisted and adjusted into position, they were all securely rivetted in position, the 80-foot derrick was cut and lowered out of the cylinder and the roof left in position. When the support of the derrick was removed, the actual deflection of the cylinder and roof ribs did not exceed one quarter of an inch.

This form of roof naturally recommends itself for its simple method of construction and ease and quickness of erection, as no scaffolding is employed in the ordinary sense of the word, as well as for lightness of scantlings and economy of construction.

Roof over the Victoria Concert Hall, Langham Place,

Under the direction of Messrs. T. E. Knightley and
C. J. Phipps, Architects.

This roof is constructed entirely of steel of mild quality, ultimate breaking strain per square inch 28 to 30 tons. It is to cover the hall 90'0" span and 115 feet in length, one end curved to an arc of a circle and the other with curved ends at the corners. Two main principals are thrown across the hall 38 feet apart, which rest on four cast-iron H-shaped stanchions 12 by 12 and 25'0" long and resting on bed-stones 3'0" long, 2'0" wide, 12 inches thick. These were erected before the wall was built, and when built it was carried up embedding them in the structure. Three intermediate principals are fixed at equal distances between and parallel to the main ones, and these are supported on short C. I. stanchions 6'6" long, which rest on a steel girder supported by the 25 feet stanchions supporting the main principals. The two main principals are intersected in their centre by two cylinders 8'0" internal diameter, 12'6" deep, of 5-16th steel plate, with steel angles and concentric flange plates top and bottom. These were intended to be used for the purpose of ventilating the

building and for the gas-burners, but they serve an important purpose in the structure, as their flanges are utilised for the purpose of connecting the radial roof ribs, thirteen at one end and eleven at the other, and supporting and connecting the end areas of the roof.

The three intermediate principals are connected to the two cylinders by transverse bracing, which enables the radial ribs to throw and transmit their stresses from end to end of the roof longitudinally by means of this cross bracing. The two main and the three intermediate principals are 90 feet from the centres of the supporting stanchions; they have a rise of 4 feet 9 inches from their support, and have a depth of 12 feet 6 inches, and are flat at the top for a length of 28 feet 3 inches.

The top member of the main principals were of 4 by 4 by $\frac{1}{2}$ angle steel, with 12 by $\frac{1}{2}$ plate as a web rivetted between them. The lower member of angle 12 by $\frac{3}{8}$ plates, the projection of the plates beyond the angle, serve the purpose of connection to the cross bracing. The thirteen radial ribs are 41 feet in length and 12 feet 6 inches deep, top and bottom members of 4 by 4 by $\frac{1}{2}$ T steel, with angles for the cross bracing. The eleven radial ribs were 32 feet long, of 4 by 4 by $\frac{3}{8}$ T steel and angles for cross bracing. The intermediate cross bracing between the cylinders were 5 by 5 by $\frac{1}{2}$ T steel with angles for bracing. The thirteen radials were fixed on short stanchions 6 feet 6 inches long, and, in consequence of the importance of not stopping light, a device had to be adopted by making a curved structure at the edge of the roof, which had the effect of keeping the roof apparently low down.

The erection of the roof was carried out in a simple manner. The cylinders were set up on end in position on the ground, and a derrick 16 inches square of fir timber 100 feet long, well bedded on the ground, was fixed inside the cylinder. The tackle was fixed on the top and the cylinder lifted to its position. A second derrick hoisted the half main principals in detail, and the intermediate principals were hoisted in one length previously to the cylinder, so that the fixing and lifting of the radials became an easy matter. The whole was pulled together securely, and when the derrick was removed from either cylinder the deflection which occurred was not more than $\frac{1}{4}$ to $\frac{1}{8}$ th of an inch. The roof supports a heavy lead flat and slabs, and heavy timbering and a heavy ceiling.

Steel Cantilevers for Balconies at Victoria Concert Hall.

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Battersea Polytechnic. Roof over Swimming-baths.

Mr. E. W. Mountford, Architect.

39 feet 3 inches span rise of roof, equal to half the span. Rafters of 5 by 3 steel joists. Principals, 10 feet apart.

Silver & Fleming, Wood Street. Roof over Warehouse.

Messrs. Ford & Hesketh, Architects.

21 feet 10 inches span, made of plates and angles; webs $\frac{1}{4}$ thick, angles 3 by 3. The rib is semicircular on the inside. principal is fitted with a steel lantern frame.

Charlotteville Board School, Guildford.

Mr. W. G. Lower, Architect.

22 feet span, 13 feet 6 inch rise. Rafters of 8 by 4 steel joists. Tie beam, about midway between the feet and apex, also of 8 by 4 steel. As a relief a curved T is fitted between the tie beam and the feet of principal.

University College, Engineering Laboratory.

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Triangular roof principal, 50 feet span, 15 feet rise, rafters of 6 by 3 steel joists. Principals 11 feet apart.

Examples of Steel Stanchions for Warehouse to Carry Six Floors.

The total load on the bottom stanchion is 150 tons. The stanchion is continuous in all cases for two floors, the sectional area being proportioned to the load at each floor by the upper half of the stanchion being made with a plate less than the lower half. The basement to ground-floor stanchion is of box section, formed of two 10-inch steel channels, with two 14-inch steel plates rivetted to each side for basement length, and one 14-inch plate for ground-floor length. The first to second floor

stanchion is of H section, and is made of an 8 by 6 joist, with two plates rivetted to each side for first floor, and one plate each side for the second floor. The upper stanchions are of similar construction, but proportioned to the loads they have to carry. This form of construction is more economical than cast-iron columns and stanchions. The form offers special facilities for forming good connections. The weight is greatly diminished, and the cost of fixing and transport is of course proportionately reduced.

A Braced Girder, 56'0 long, 10'0 deep, of Rolled Sections.

This was erected 400 from the ground above an existing building, the ends being supported by columns attached to existing girders in building. The girder supports the weight of half a three-storeyed building erected on it, and an adjoining wall. The girder is calculated to support an equally distributed load of 125 tons. The girder is double, and is built with the rolled sections side by side, the upper member having a 14-inch plate on upper flanges. The lower member is 2'12 by 6, the bracing at ends and upper member 14 by 6. The structure of the girder is light, and the position in which it was built was the reason for the adoption of the design, as each of the component parts are easily handled, and the whole was bolted together in position. No deflection occurred with its load. It was fixed at the Tivoli, Strand, under the direction of Mr. C. J. Phipps.

Seven-arched Steel Roof Principals, 53'6 span, 36'6 height.

Messrs. A. L. Watkins & Sons, Architects.

These were fixed for the New Market, Newport, Monmouthshire. They rise vertically 10'6, and then are arched to a radius of 26'0. The width of ribs 1'6 at base, and 2'6 at the crown of the arch. Both the top and bottom members are alike of 2'4 by 4 by 7-16 angle section, and 10 by 7-16 on face of the angles, both sides the full extent of the rib. The vertical rise has a plate $\frac{1}{4}$ -inch thick connecting the members, and beyond lattice-bars 4 by 2 by $\frac{1}{2}$ intersecting 8 pantines 20'0 long 8 by 3. The sections of the arched ribs were completely rivetted together on the ground, and then raised into position by a derrick pole and tackle. A light scaffold was erected on the members of the ribs, and so the roof was erected and constructed with scaffolding of a small cost.

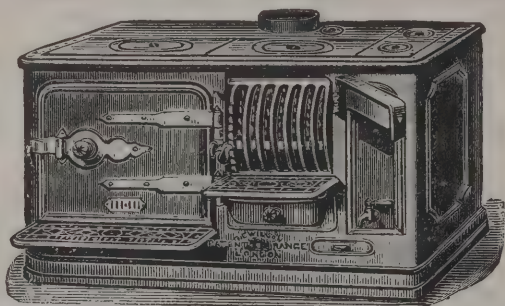
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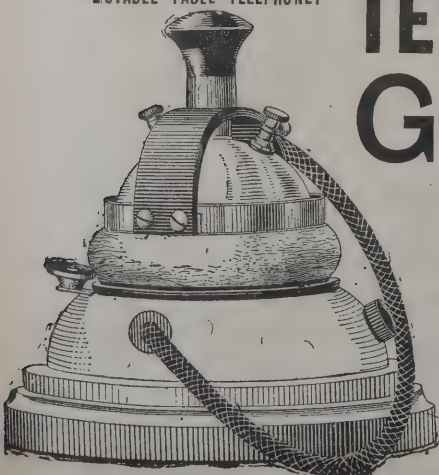
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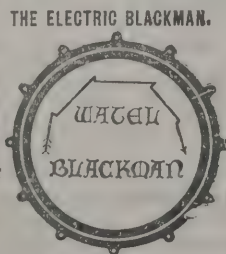
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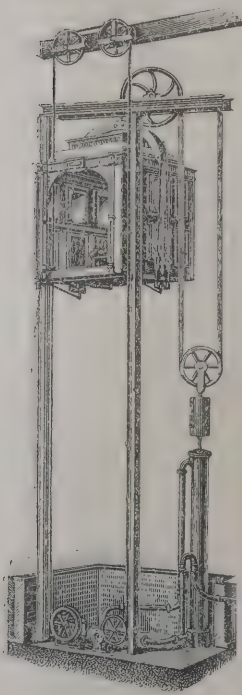
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E. T. Hatherly, Bristol	£3,787 0 0
W. Thomas & Co., Cardiff	3,589 0 0
H. Gibbon, Cardiff	3,430 0 0
Jones Bros., Cardiff	3,400 0 0
G. H. Hodgkinson, Cardiff	3,399 19 9
J. Allan, Cardiff	3,398 0 0
A. Berridge, Cardiff	3,368 10 0
J. Hopkins, Cardiff	3,353 0 0
Jones & Co., Gloucester	3,348 0 0
C. C. Dunn, Cardiff	3,343 8 10
Newby & Co., Cardiff	3,329 18 11
D. Davies, Cardiff	3,319 0 0
W. Symonds, Cardiff	3,290 0 0
D. J. Davies, Cardiff	3,285 0 0
R. UPHAM, Cardiff (accepted)	3,169 0 0

CLACTON-ON-SEA.

For Alterations to Rose Bank, Clacton-on-Sea, for Mr. J. Fenton-Jones, J.P. Mr. W. A. FINCH, Architect, 76 Finsbury Pavement, E.C.	
N. DEMAID, Clacton (accepted)	£85 0 0

DORKING.

For Building a pair of Villas, Bakery, Stable, &c., for Mr. C. Palmer. Mr. F. J. DIBBLE, Architect, Dorking.	
Hamblin Bros.	£1,450 0 0
Canter	1,297 0 0
Cole	1,248 0 0
For Building Villa, Box Hill Estate, for Mr. Wm. Beall. Mr. F. J. DIBBLE, Architect, Dorking.	
Hamblin Bros.	£1,350 0 0
Canter	1,197 0 0
Putney Bros.	1,188 0 0
Debenham	1,139 0 0

DAGENHAM.

For Enlargement of Beacontree Heath School, for the Dagenham School Board. Messrs. WIGG, OLIVER & HUDSON, Architects, 80 Leman Street, E., and 7 Bedford Row, W.C. Quantities by Messrs. GOODMAN & SIMPSON.	
McCormick & Sons, Canonbury	£2,816 19 10
Dowsing & Davis, Romford	2,547 15 0
Lorden & Son, Upper Tooting	2,538 0 0
J. Gozzitt, Maldon	2,405 0 0
E. West, Chelmsford	2,307 0 0
Hammond & Son, Romford	2,302 18 0
W. Watson, Ilford	2,289 0 0
T. Bruty, Hornchurch	2,274 18 4
J. Webb, Stratford	2,190 0 0

EASTBOURNE.

For Alterations and Additions to House, Langney Road, Eastbourne, for Mr. J. Fenton-Jones, J.P. Mr. W. A. FINCH, Architect, 76 Finsbury Pavement, E.C.	
J. Peerless, Eastbourne	£725 0 0
W. BACKHURST, Eastbourne (accepted)	715 0 0

GUILDFORD.

For Erection of Wesleyan Chapel and Schools, Guildford. Mr. F. BOREHAM, Architect, 75 Finsbury Pavement, E.C. Quantities by Messrs. NORTHCROFT, SON & NEIGHBOUR, 57 Charing Cross, S.W.	
S. Ellis	£6,750 0 0
P. C. May	6,650 0 0
Higlett & Hammond	6,232 0 0
Young & Lonsdale	6,220 0 0
Holloway Bros.	6,113 0 0
Mitchell Bros.	5,725 0 0
Harris & Son	5,700 0 0
R. Wood	5,439 0 0
Kingenlee	5,394 0 0
Bottrill & Son	5,350 0 0
Margett	5,333 0 0
Capp & Son	5,300 10 0
Rowland Bros.	5,150 0 0
Downes	5,100 0 0
A. A. GALE (accepted)	4,717 0 0

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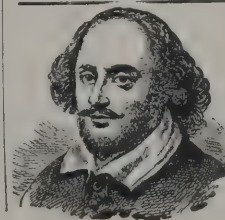
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 Neave & Son, Paddington £1,327 0 0
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 H. Drury, Harrow 1,116 0 0
 H. Lee, Southall 995 0 0

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For Building First Two Blocks of Twelve Dwelling-houses, at the Lound, Kendal. Mr. JOHN HUTTON, Architect, Kendal. Quantities by the Architect.
 Hill & Dixon, Kendal, builder £1,025 0 0
 Nelson Bros., Kendal, joiner 950 0 0
 Lawrence Airey, Kendal, plumber, gas, water and smith 222 10 0
 Llyn & Nicholson, Kendal, plasterer 205 8 6
 Jas. Bailey, Penrith, slater 174 10 4
 Thos. Wileman, Kendal, painter and glazier 81 10 6
 £2,658 19 4

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For Enlarging and Making extensive Alterations to the Messrs. W. J. & M. GIVIN, Architects, Coleraine.
 W. C. Gault, Ballymena £1,588 11 6
 A. Maxwell, Coleraine 1,398 9 6
 J. Kennedy, Coleraine 1,280 17 0
 W. Douglas, Coleraine 1,232 19 6
 J. McNeill, Ballymoney 1,097 19 6
 A. HIGGINS, Coleraine (accepted) 1,168 9 6

LLANELLY.

For Erection and Completion of Six Shops and Club Premises, Murray Street, Llanelly, for Mr. Gwilym Evans. Messrs. J. BUCKLEY WILSON, F.R.I.B.A., and GLENDINNING MOXHAM, M.S.A., Architects, Swansea.
 G. Mercer, Llanelly £3,899 7 0
 J. D. Williams, Knighton 3,765 0 0
 T. Watkins & Co., Swansea 3,693 0 0
 D. Jenkins, Swansea 3,350 0 0
 D. C. Jones & Co., Gloucester 3,230 0 0
 J. P. Jones, Llanelly 3,200 0 0
 GUSTAVUS BROS., Swansea (accepted) 3,170 0 0

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For Engineering Work consisting of Boilers, Laundry and Kitchen Fittings, Hot-water Supply Apparatus and other work at the New Infirmary, High Street, Lewisham, for the Guardians of the Poor of the Lewisham Union. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.
 Wenham & Waters £5,137 0 0
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 J. Fraser & Son 4,110 0 0
 J. & F. May 3,800 0 0
 Berry & Co. 3,438 0 0
 BENHAM & SON, Wigmore Street, W. (accepted) 3,215 0 0

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For Construction of Chrysanthemum House, Finsbury Park, for the County Council.
 Marshall & Co. £1,899 15 6
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For Rebuilding Nos. 3A Wimpole Street and 24 Wigmore Street, W., for Messrs. J. T. Bedford & Co. Mr. C. H. WORLEY, Architect. Quantities by Mr. R. C. GLEED.		
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Simpson & Son	6,680	0 0
T. Boyce	6,580	0 0
G. H. & A. Bywaters	6,490	0 0
Bush & Sons	6,377	0 0
Holloway Bros.	6,188	0 0
Lawrance & Sons	6,175	0 0

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F. W. Thomas	750	0 0
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J. Inwood	641	0 0
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F. & H. F. Higgs	5,779	121
F. J. Coxhead	5,582	84
D. Charteris	5,515	100
J. Marsland	5,385	80
H. Lovatt	5,356	101
Co-operative Builders, Limited	5,142	70
Kirk & Randall	5,070	100
Holliday & Greenwood	4,949	90
W. Downs	4,880	55
J. Tyerman	4,708	102

LONDON—continued.

For Enlargement of Board Schools, Randall Place, Greenwich. Mr. T. J. BAILEY, Architect.		
W. M. Dabbs	£2,694	0 0
F. & H. F. Higgs	2,673	6 0
W. Gregar & Son	2,632	0 0
J. Smith & Sons	2,510	0 0
J. Wilmott & Sons	2,508	0 0
F. J. Coxhead	2,483	0 0
Kirk & Randall	2,330	0 0
Co-operative Builders, Limited	2,286	0 0
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If Brickwork in Cement, add

£48	0 0
57	0 0
39	0 0
42	0 0
47	10 0
39	0 0
46	19 6

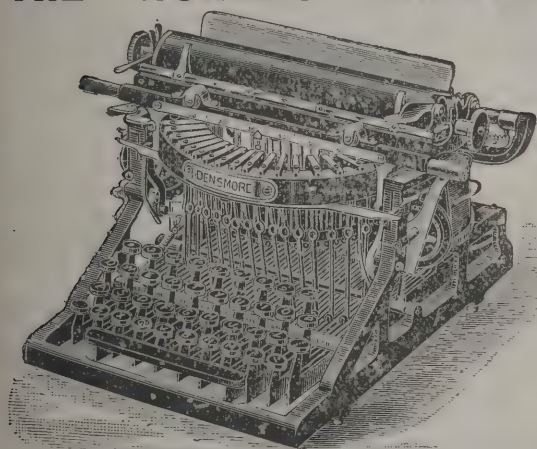
For Painting and Repairs and other Works at the Eastern Hospital, The Grove, Homerton, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

White & Son	£3,299	0 0
G. Foxley	2,990	0 0
W. Wells	2,989	0 0
E. Proctor	2,500	0 0
H. Wall & Co.	2,394	0 0
Lilly & Lilly	2,374	0 0
W. F. Hadlow	2,367	0 0
H. Fullager	2,310	0 0
W. & E. Mills	2,300	0 0
W. Wythe	2,300	0 0
Vigor & Co.	2,297	0 0
J. Hughes	2,181	0 0
T. W. Eastwell	2,128	18 6
Stokes & Co.	2,100	0 0
M. Batchelor	1,942	0 0
AKERS & Co, South Norwood (accepted)	1,729	0 0

For Erection of New House and Shop at Waltham Cross, N., for the Colvin Estate. Messrs. WIGG, OLIVER & HUDSON, Architects, 80, Leman Street, E., and 7 Bedford Row, W.C. Quantities by Messrs. GOODMAN & SIMPSON.

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For Alterations and Additions to St. Mark's School, White-chapel, E. Messrs. WIGG, OLIVER & HUDSON, Architects, 80 Leman Street, E., and 7 Bedford Row, W.C. Quantities by Mr. F. G. W. BUSS.

G. E. Weston £1,616 13 4
J. Sparks & Son 1,495 0 0

For New Offices of the Mercantile Marine Board, Well Street, E. Messrs. WIGG, OLIVER & HUDSON, Architects, 80 Leman Street, E., and 7 Bedford Row, W.C. Quantities by Messrs. C. STANGER & SON.

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Garlick & Horton, Limited 9,284 0 0
F. & F. J. Wood 9,250 0 0
J. Brown, Son & Blomfield 8,917 0 0
J. Sparks & Son 8,888 0 0
Hearle & Farrow 8,706 0 0
Harris & Wardrop 8,662 0 0
M. Patrick & Son 8,544 0 0
J. & H. Cocks 8,511 0 0
W. Shurmur 8,461 0 0
J. O. Richardson 8,359 0 0
J. Bentley 8,351 0 0
W. GLADDING, Whitechapel, E. (accepted) 8,296 0 0

NOTTINGHAM.

For Additions to School of Art, Nottingham. Mr. ARTHUR BROWN, M.I.C.E., Architect, Nottingham. Quantities by Messrs. BERRIDGE & BARNES, Wheeler Gate, Nottingham.

J. F. Price, Nottingham £1,927 0 0
A. B. Clarke, Nottingham 1,900 0 0
Hodson & Son, Nottingham 1,864 0 0
T. Cuthbert, Nottingham 1,823 0 0
J. Hutchinson, Nottingham 1,815 0 0
W. Savage, Nottingham 1,800 0 0
Appleby & Lambert, Nottingham 1,800 0 0
F. Messom, Nottingham 1,800 0 0
J. Attenborough, Nottingham 1,792 0 0
Gilbert & Gabbitass, Nottingham 1,788 0 0
H. Vickers, Nottingham 1,750 0 0
Bell & Sons, Nottingham 1,728 0 0
T. Whittaker, Nottingham 1,656 0 0
J. Ocroft, Nottingham 1,647 0 0
J. G. Thomas, Nottingham 1,633 0 0
DENNETT & INGLE, Nottingham (accepted) 1,506 0 0

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For Restoring Tower of Church of St. Giles, Newcastle-under-Lyme. Mr. EWAN CHRISTIAN, Architect. Willcock & Co, Wolverhampton. Cost about £4,000 0 0

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A. Kellett 59,893 19 11
S. Hutchins 58,352 12 11
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Kirk & Randall 57,720 0 0
S. G. Halliday 57,701 0 0
H. Willcock & Co. 55,557 0 0
T. Martin 55,500 0 0
Parnell & Son 55,276 12 0
De Vere, Buckingham & Co. 54,243 0 0
J. T. Chappell, Pimlico 51,663 0 0

PENEGROES.

For Building New Manse at Penygroes, Tregarth. Mr. RICHARD DAVIES, Architect, Bangor. William Roberts, Carneddi Terrace, Bethesda. £402 0 0

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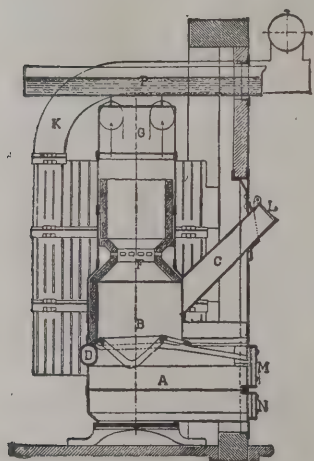
For Construction of Grain Shed, for the Preston Corporation.

J. CARTMELL, Preston (accepted) £5,778 9 0

For Building Superstructure, Cross School, at Preston, for the Committee of the Cross Deaf and Dumb School. Messrs. SAMES & GREEN, Architects, Blackburn. Quantities by the Architects.

E. Lewis & Son, Blackburn £6,900 0 0
C. Walker, Preston 6,703 0 0
John Walmsley, Preston 6,660 0 0
Wm. Hothersall, Preston 6,613 0 0
Thos. Cottam, Preston 6,602 11 0
JOHN CHRISTIAN, Preston (accepted) 6,385 0 0
Tulles & Son, Preston 6,340 13 0
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PLASHET.

For Building Board School for 1,898 Children, Shaftesbury Road, Plashet, for the East Ham School Board. Mr. R. L. CURTIS, Architect.			
N. Lidstone, Finsbury Park, N.	£18,295	0	0
McCormick & Sons, Islington	17,945	0	0
W. H. Lascelles & Co., Bunhill Row, London	17,750	0	0
Hearle & Farrow, Stratford, E.	17,644	0	0
J. O. Richardson, Peckham	17,568	0	0
V. J. Maddison, Canning Town	17,457	0	0
John Allen & Sons, Kilburn	17,390	0	0
Kirk, Randall & Co., Woolwich, E.	17,247	0	0
W. Gregar & Son, Stratford, E.	17,200	0	0
Jos. Smith, Witham	16,850	0	0
W. Watson, Ilford	16,557	0	0

SOUTHAMPTON.

For Enlargement of School Buildings, Sholing, for the St. Mary Extra and Hound School Boards. Messrs. W. H. MITCHELL, SON & GUTTERIDGE, Architects, 9 Portland Street, Southampton.			
H. Cawte, Southampton	£774	0	0
A. Warden, Southampton	770	10	0
S. Nichols, Southampton	741	0	0
H. Stevens & Co., Southampton.	730	0	0
Rowland & Son, Southampton	728	0	0
J. Hinton, Southampton	710	0	0
T. J. JUKES, Southampton *	688	0	0

* Accepted subject to approval of Education Department.

ST. ALBANS.

For Construction of Brick Gasholder Tank at the St. Albans Gasworks.			
T. Smart, Nottingham	£1,696	0	0
J. Dickson, St. Albans	1,479	0	0
W. G. Dunham, Luton	1,279	0	0
Savage, St. Albans	1,278	0	0
Chamberlain, St. Albans	1,150	0	0
Boff Bros., St. Albans	1,140	0	0
C. Miskin, St. Albans	1,086	0	0

TONBRIDGE.

For Erection of Pair of Cottages at Hilden, near Tonbridge, for Messrs. Auldjo. Mr. R. OWEN ALLSOP, Architect.			
G. & F. PENN, Pembury (accepted)	£488	17	0

WALTHAM ABBEY.

For Making-up Manor Road, Waltham Abbey, for the Waltham Holy Cross Local Board. Mr. C. W. WAGGS, Engineer.			
Lawrence, Waltham Abbey	£109	0	0
Wm. Pavey, Winchmore Hill	98	0	0
C. J. Betts, Enfield Highway	93	0	0
Gardener, Waltham Abbey	85	0	0

TRADE NOTES.

THE extensive buildings of the new Workhouse Infirmary, Liverpool, are being erected from the plans and under the superintendence of Mr. C. H. Lancaster, architect, of Liverpool, for the guardians of the poor of the city of Liverpool. Each pavilion is four storeys high, the wards in the same being 110 feet by 24 feet. The whole of the wards are being warmed by Mr. E. H. Shorland, of Manchester, by means of his patent open fireplace Manchester stoves, with descending smoke-flues, which arrangement is now being largely adopted in hospital wards. There are two stoves in each ward, some forty stoves being used in all.

IN continuation of the additions and enrichment of the interior of St. Cuthbert's Church, Philbeach Gardens, S.W., Messrs. Jones & Willis, who executed the carved priests' stalls last year, have now in hand a fine oak rood-screen, which it is expected will be completed in a few months. The columns supporting the beams are surmounted by richly-carved figures under traceried canopies, the sides of screen proper are worked out with traceried panels and carved cresting, the immediate centre being carried up to a considerable height, and finished by a representation of the Crucifixion of our Lord, the central figure being more than life-size. The whole of the work is being executed from the drawings and under the superintendence of the architects, Messrs. Gough & Roberts, Carlton Chambers, Regent Street.

THE important and ancient manufacturing village of Birstall, near Leeds, has just witnessed an interesting ceremony. The fine old church was filled to hear a short service from the vicar, the Rev. John Kemp, M.A. Afterwards Miss Taylor, daughter of the vicar of Gomersal, set the fine new clock in motion, with Cambridge chimes, and showing the time on two external dials. A dampness was thrown over the proceedings owing to the death of the chief contributor a few days previous, Mrs. Battye, wife of the chairman, and grandmother of the young lady who started the clock. The ringers

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rang muffled peals during the afternoon and evening. Birstall indeed is noted for its fine bells and good bell-ringers. The clock and chimes were made and fixed by Messrs. Wm. Potts & Sons, clock manufacturers, of Guildford Street, Leeds, who also lately fixed a fine clock at Catterick Church, North Yorkshire.

THE Ellon District County Council Committee have accepted the offer of Mr. Scroggie, Kinharrochie, to bridge the Ythan at a cost of 1,260*l*.

THE contract for work at Thame Church on the south aisle and porch has been accepted from Messrs. Wells & Son, contractors, at 544*l*. 4*s*.

At a meeting lately held the Hospital Sub-Committee of the Leeds Corporation Sanitary Committee decided to advertise for tenders for the furnishing of the portion recently added to the hospital at Manston Hall.

SIX tenders have been received by the Shrewsbury Town Council for the erection of the proposed public baths between the Quarry Grounds and Teece's Lane. The highest tender was 9,514*l*. 11*s*. 4*d*.; and the lowest, that of Mr. Henry Farmer, builder, Shrewsbury, 7,145*l*. 12*s*., was accepted.

At the meeting of the Coventry City Council, on the recommendation of the Baths Committee, it was decided that the new swimming-baths should be lined with asphalt in lieu of Portland cement, at an extra cost of 240*l*., and to accept the tender of the Coventry Gasfittings Company, Limited, for 1,390*l*. for engineers' work in connection with the hot and cold water supplies and heating apparatus.

ON Wednesday last the Mincing Lane Safe Deposit was ceremoniously opened to the public, on which occasion Mr. S. Studd, the managing director of Milner's Safe Company, Limited, was present, as well as Mr. F. Wells, the manager, who explained in a lucid manner the formidable intricacies of the emporium, which is henceforth destined to guard the treasures of the London commercial sale rooms' frequenters and City magnates in general. The establishment is one which is calculated, both from a constructional as well as an artistic point of view, to attract much attention and patronage.

WE hear that Rendle's patent "Invincible" glazing has been selected by the Great Eastern Railway for the roofs of the extension of Liverpool Street Terminus, London. The area of the glazing amounts to about 100,000 feet superficial. The same system has also been selected by the architect for the skylights over the National Portrait Gallery, Trafalgar Square.

In each case the glass is laid in copper bars, and is the latest improved system of Messrs. W. E. Rendle & Co.

THE name of the firm given in the list of tenders last week for painting, &c., at the South Western Hospital should have appeared as "Jenrick & Crocker."

VARIETIES.

THE Water Committee of the Liverpool Corporation being anxious to give employment to workmen in the district, have instructed the engineer to obtain tenders for iron piles for additional works required. The completion of the city main pipe lines will involve an expenditure of 80,000*l*. The works are to be expedited as much as possible.

THE *Leeds Mercury* (February 28) says:—At a meeting of the Leeds streets and sewerage committee held yesterday, it was agreed to apply to have a clause inserted in the new Consolidation Bill empowering the Corporation to provide 210,000*l*. for various sewage works. It was also agreed to purchase two houses in Willow Terrace Road for the purpose of a street improvement, at a cost of 1,130*l*.; 3,000 square yards of land from Mr. Archer for the improvement of Harehills Lane; and 208 square yards of land from Dr. Clayton for the improvement of Gledhow Lane.

AN inquiry has been held at Knaresborough into an application by the local authorities to borrow 7,000*l*. for the establishment of a sewerage system, by the intermittent land filtration process.

At the meeting in Birmingham of the reception committee of the Church Congress, authority was given for securing Bingley Hall, which is to be fitted up for the larger meetings at a cost of about 1,000*l*. The Town Hall and Midland Institute Theatre are to be secured for sectional meetings, and it is hoped the old post-office building will be available as a reception-room.

MR. CAMPBELL BANNERMAN has stated that, so far as possible in army contracts for building work in Ireland, Irish materials were used, but it was found that Welsh slates were lighter and more durable than Killaloe slates, and therefore cheaper in the end. Consequently, the contracts for work at the Curragh, so far as entered into, had included Bangor slates. If, however, Killaloe slates could be supplied of equal quality with the Bangor slates, and not higher in price, there would be no objection to use them in any further contracts.

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BUILDING AND BUILDERS.

AT the meeting of the London County Council the Fire Brigade Committee recommended that the Council should purchase from the Corporation of London, for the sum of 16,000*l.*, the site fronting John Carpenter Street, to erect a fire station; also for the erection of a Shoreditch fire station in substitution to the existing one in Old Street, by the purchase of land fronting Tabernacle Square.

THE Gas and Lighting Committee of the St. Helens Corporation have approved of plans of new tar-distilling works to be erected at the present gasworks.

A NEW bonded warehouse, the plans of which have been approved by the Board of Inland Revenue, is about to be erected in Arbroath by a number of the local wine and spirit and tobacco merchants. It is to be built in West Newgate Street, on the site of an old brewery.

AT the meeting of the Dean of Guild Court, Glasgow, the Police Commissioners received authority to proceed with the erection of the new police offices for the southern district in Oxford Street and Nicholson Street; and the Corporation were authorised to erect buildings in Pollokshaws Road for stables, workshops and offices in connection with their taking over of the tramway system.

AT the meeting of the Gloucester City Council it was reported that the negotiations for transforming the Corn Exchange into the Central Post Office had ended satisfactorily, but regret was expressed that it would be necessary to take out the present front, and bring the building level with the street.

ELECTRICAL.

AN inquiry has been held by the Local Government Board at Blackburn into an application of the Town Council to borrow 50,000*l.* for electric lighting purposes. The Council recently issued a circular asking tradesmen if they would use electric lighting if introduced, and the response was so unanimous that the Council decided to proceed at once.

PLANS of buildings to be erected in Cotton Street, and adjoining the Gasworks, which are to contain the plant of the electric lighting scheme promoted by the Aberdeen Corporation, have been approved by the Plans Committee of the Town Council. The buildings will cost 3,500*l.*

THE installation for lighting several of the principal streets of Glasgow has been inaugurated by Lord Provost Bell. Lord Kelvin, at the luncheon which followed, said he hoped that the installation would be extended till the whole of Greater Glasgow was so illuminated. In that way they might secure for Glasgow what had been arrived at in New York—a prodigious diminution of crime.

A LECTURE was delivered by Dr. E. Hopkinson on "Electrical Railways" at the Royal Institution. A comparison he made between electric and steam traction showed the cost to be the same in both cases. Lines, he said, were being projected on which trains will travel at 150 and 200 miles an hour.

TENDERS FOR THE NEW LOCH KATRINE AQUEDUCT.

AT a recent meeting of the Glasgow Town Council the Sub-Committee of the Water Trust Works recommended that the offer of Messrs. Morrison & Mason, Limited, for the construction of the Black Rig section of the new Loch Katrine aqueduct be accepted. The amount of the tender was 86,582*l.* 14*s.* 3*d.*

Mr. Starke said he understood that there were a number of tenders for this work, and that there was one of them 7,000*l.* or 8,000*l.* lower.

Mr. Waddell said the tenders varied from 79,000*l.* to 93,000*l.* The committee had thought it judicious to send the four lowest tenders to the sub-conveners, along with the convener of the General Committee and the sub-convener. These tenders were gone over very carefully along with the engineer. They then made inquiries with respect to the position of the parties, and took notes of the prices of various articles connected with the contracts. They found in the tenders which were lower than that of Messrs. Morrison & Mason prices put in for certain things which the engineer stated could never enable the parties to finish the work. When these prices were compared with those of the three contractors who were at present doing work for them, they found that the objections of the engineer were borne out. Taking these matters into consideration they were convinced that there was something wrong with the lower offers. Not content with that, they further took into consideration the whole bearings of the case, and having regard to the fact that the contract would extend over four years, it was thought that it would be a very serious matter indeed if the contractors, as had been the case in one or two instances

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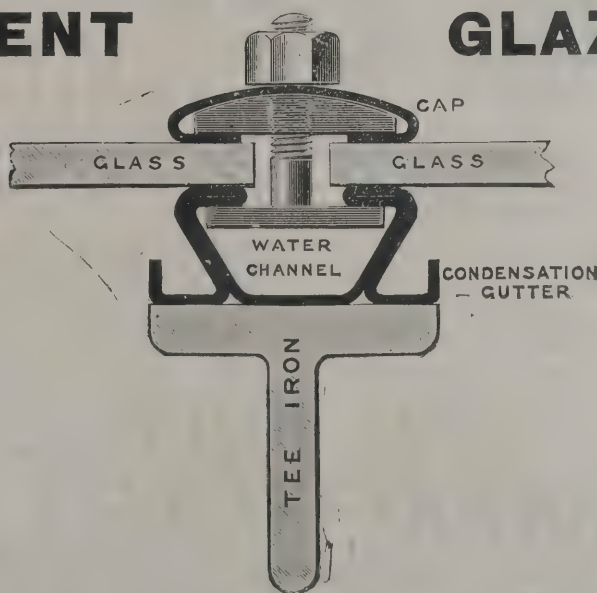


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before, should break down, and not be able to go through with the work. The committee also had regard to the necessity for providing a larger supply of water as speedily as possible, and to the demands in this respect, not only of the city but of districts outside. The two lower offers were 79,791*l.* and 84,602*l.* The Water Committee, in recommending the offer of Messrs. Morrison & Mason were unanimous. When the members of the committee themselves were unanimously satisfied that they were doing what was right in the interests of the citizens and of contracting work generally, he thought the Council should approve of their recommendations as far as they possibly could. Already, in consequence of taking the lowest estimate, the work had cost at least from 20,000*l.* or 30,000*l.* more than it would have done had the Corporation taken the estimate before the lowest one.

Mr. J. W. Dick said that in specifications for contracts it was always found that there was a difference in the prices quoted by various contractors. Therefore he did not see why in the present instance a point should be made of the varying prices of the materials required. He was led to believe on the very best authority that no fault could be found with the firm who had sent in the lowest offer, or that there was any doubt about their ability to complete the contract as expeditiously and as well as Messrs. Morrison & Mason. It seemed to him that in proposing to give the work to Messrs. Morrison & Mason they were strengthening the feeling which was current outside the Council, that they existed as a body to a very large extent for the benefit of that firm.

Mr. King said the reasons which influenced the committee could not very well be stated in detail, but surely sufficient confidence could be reposed in the members to cause the Council to believe that the reasons were adequate. Their decision had only been come to after long consideration, and but for the fact that they were hemmed in to accept the lowest tender, they would not have made the recommendation that they had done.

Mr. Battersby said that on asking the committee to inform him why the lowest offer had not been accepted he had been informed that in one instance there was not sufficient caution that the work would be completed in the necessary time. He had, therefore, been satisfied, from his limited experience, that the offer in the circumstances could not be accepted. With regard to another of the offers, the committee were satisfied that the prices quoted for materials were below the market rate, which, in all probability, would have led to the result Mr.

Waddell had indicated. He was opposed to accepting the cheapest contract simply because it was the cheapest. They had had experience in connection with another committee from which it was apparent that the lowest offerer, as shown by himself, had lost no less than 18,000*l.* Further than that, he had been informed that at the time the contract was accepted it was known that the estimate was really below the price at which it was possible to do the work. Another point in connection with the present contract was that the two lowest offerers had not had experience which made it judicious that their contracts should be accepted.

Mr. Ure said that in a case such as that under consideration, where delicate explanations could not be given at a public meeting, he thought they were justified in accepting the unanimous recommendation of a committee of twenty-seven members.

Mr. Campbell said he thought even a unanimous decision of a committee ought to be carefully scrutinised; but he supported the recommendation on other grounds. This Black Rig section of the aqueduct formed a small but very important part of a general scheme. It was therefore not only desirable but imperative that the most competent contractors available should be selected.

Mr. Starke said that personally he was satisfied to accept the unanimous recommendation of the committee, but a good deal of comment was being made outside, and he thought it his duty to bring it before the Council, that the reasons for accepting the contract might be made public.

The minute was then approved.

THE M'EWAN HALL, EDINBURGH.

THE members of the Edinburgh Architectural Association a few days ago visited the M'Ewan Hall, where they were received by Dr. Anderson, who showed the party over the building from basement to summit. He explained that he had adopted the form of the Greek theatre, believing that to be the best form for the auditorium. There were two galleries both alike, the one above the other, and the building was capable of holding three thousand people. The arrangement of the staircases was such that the occupants of the two galleries never came together, and there were a good many entrances and exits. A large skylight and a series of windows close to the roof furnished the principal means of lighting the building,

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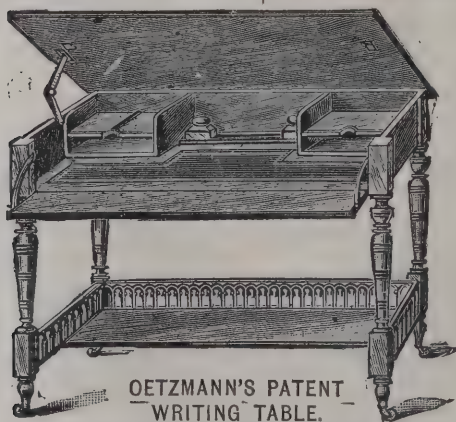
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and the air was to be heated by passing over a steam coil. There was a great outer wall, and an inner wall of arches and pillars, the diameter of the building being 144 feet 6 inches. To roof such a building was rather a problem, and he had called in the assistance of Mr. Westland, of Messrs. Cunningham, Blyth & Westland, who had produced a very clever thing. It was composed of steel ribs, and to him appeared a very novel and complete production. It was to be hoped, too, that before long the great tower would be erected—a tower which would reach to about 280 feet in height. Behind the platform there was a gallery, where, he understood, there was to be erected a very fine organ. Arrangements were also being made so that an orchestra could be fitted up when wanted. This was entirely an afterthought, the hall not having been made for that purpose. After the building was commenced the professor of music came forward—he ought to have come before—and a makeshift had been resolved upon. Mr. Westland, at the request of the architect, described the construction of the roof. The whole structure of the roof, he said, was carried on twenty-two ribs, which had to be of peculiarly strong construction, because it was impossible to put in any tie-rods. The whole horizontal strain had to be borne by the bracing between the ribs. One awkward thing in connection with the bracing was that at the back of the stage the circle was not completed. If it had been a complete circle, the strains would have been easily calculated, but as the circle stopped the whole strain had to be carried across the stage by means of a very heavy steel girder, weighing about 6 tons. In order to prevent any horizontal thrust on the walls, every rib was set upon rollers, because on a roof of that size there would be considerable expansion and contraction with the changes of temperature. It might be as much as half an inch for the whole roof, and that would have created some movement of the wall. To prevent this, therefore, the girders rested upon rollers. Though it might seem rather an unsafe thing to set such a large roof upon rollers, the building, taken as a whole, could never move in the direction of any one roller, because the whole of the other rollers were preventing it from doing so. Therefore, although on rollers, it was really as strong as if it were bolted down or set upon bed-plates. It was made of the usual kind of steel of which bridges and such work was made, standing a strain of 26 to 30 tons to the square inch. The roof was calculated to stand a strain of from 5 to 5½ tons to the square inch. It was erected in a very ingenious way, a wooden stage being raised in the centre of the hall, and a circular crane employed which

travelled round the whole building, raising the ribs and setting them in their places whole. When completed the roof did not subside more than an eighth of an inch. At the close of the visit Mr. W. W. Robertson proposed a vote of thanks to Dr. Anderson, remarking that in the course of their examination of the building they had seen a great deal to admire, and a great deal to interest and instruct them. He spoke of the exceptional character of the building, and specially complimented Dr. Anderson on having imparted to it something of a monumental character worthy of the great university to which it belonged.

THE ECCLESIASTICAL COMMISSIONERS AND LEASEHOLDS.

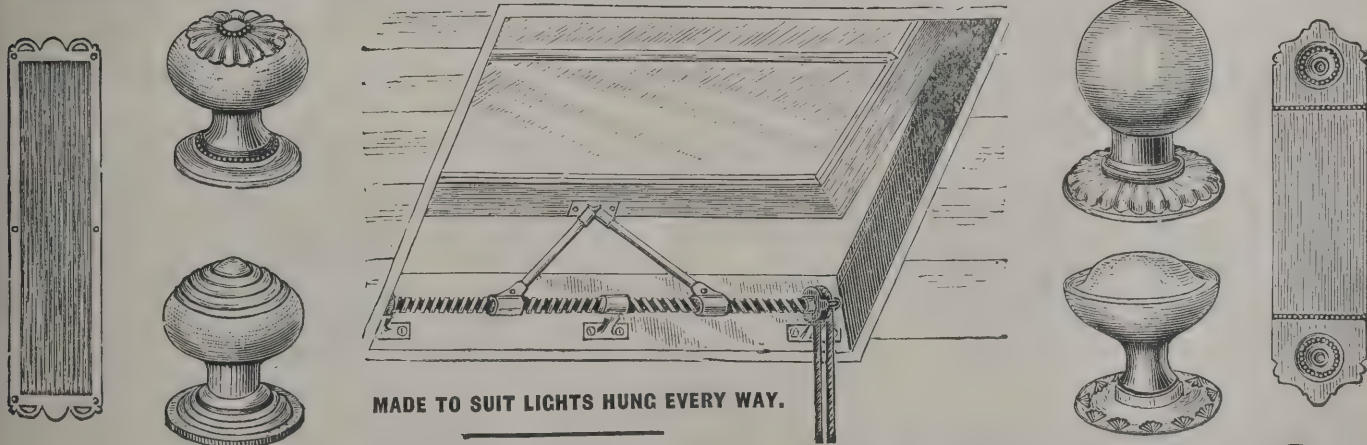
THE Ecclesiastical Commissioners have for some time past had under their consideration the various questions which have been raised with reference to the present system of leasehold tenure in London and the suburbs, with the view of ascertaining how far it might be possible to secure to their lessees the benefits arising from expenditure made by them on the improvement of the property comprised in their leases. To do this without injury to the trust which Parliament has committed to the charge of the Commissioners has involved numerous difficulties. The Commissioners are of opinion that an equitable solution may be found in the extension of the term of the leases to 999 years (making them practically perpetual), at such an increase of rent as will compensate the Commissioners for the surrender of their reversionary interest in the property. The amount of this additional rent would be ascertained by a conversion of the present leasehold term into a perpetuity on the basis of the 3 per cent. tables.

The method proposed for adoption will be perhaps best understood from an examination of the following examples:—

Example A.—House and garden of net annual value of 100*l.*, held on lease for an unexpired term of 87 years at a ground-rent of 10*l.* per annum. The additional rent in this case would be 3*l.* 16*s.* 5*d.* per annum, *i.e.* the property would be held on lease for 999 years at a rent of 13*l.* 16*s.* 5*d.* per annum.

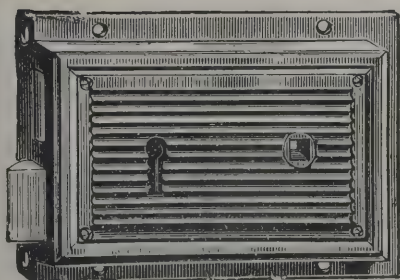
Example B.—House and garden of net annual value of 40*l.*, held for an unexpired term of 65 years at a ground-rent of 5*l.* per annum. The additional rent would be 2*l.* 15*s.* 7*d.* per annum, *i.e.* the property would be held on 999 years' lease at a rent of 7*l.* 15*s.* 7*d.* per annum.

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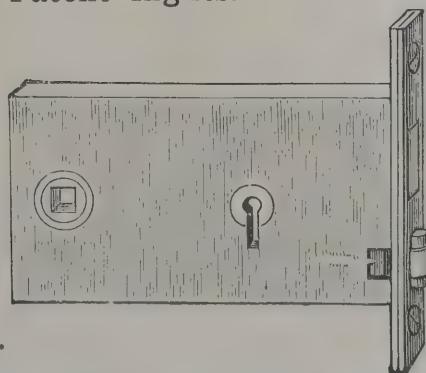


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Example C.—House and garden of net annual value of 60*l.*, held on lease for an unexpired term of 85 years at a ground-rent of 7*l.* per annum. The additional rent would be 2*l.* 7*s.* per annum, *i.e.* the property would be held on 999 years' lease at a rent of 9*l.* 7*s.* per annum.

Example D.—House and garden of net annual value of 50*l.*, held on lease for an unexpired term of 90 years at a ground-rent of 10*l.* per annum. The additional rent would be 1*l.* 8*s.* per annum, *i.e.* the property would be held on 999 years' lease at a rent of 11*l.* 8*s.* per annum.

Example E.—House and garden of net annual value of 200*l.*, held on lease for an unexpired term of 95 years at a ground-rent of 30*l.* per annum. The additional rent would be 5*l.* 8*s.* 7*d.* per annum—*i.e.* the property would be held on 999 years' lease at a rent of 35*l.* 8*s.* 7*d.* per annum.

Example F.—House and garden of net annual value of 90*l.*, held on lease for an unexpired term of 75 years at a nominal ground-rent of 2*l.* per annum. The additional rent would be 5*l.* 13*s.* 3*d.* per annum—*i.e.* the property would be held on 999 years' lease at a rent of 7*l.* 13*s.* 3*d.* per annum.

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THE SITE FOR CHRIST'S HOSPITAL AT HORSHAM.

IN the House of Commons on Monday Mr. Bonsor, the member for Wimbledon, asked the Vice-President of the Committee of Council on Education whether 1,000 acres of dairy land in Sussex, 37 miles from London, have been contracted for as the site for the boarding schools for 700 boys, 350 girls and 120 infants of the future Christ's Hospital, which, by the scheme approved by Her Majesty, were to be built within a convenient distance from the City of London; whether the whole governing body of forty-three set up by the scheme approved of such location for a metropolitan foundation of three centuries' life in the City of London itself, and whether he would be good enough to give the reasons for such a choice. Mr. Thomas Ellis, in reply, said:—The Council of Almoners of Christ's Hospital, with the consent of the Charity Commissioners, have concluded the purchase of about 1,000 acres of land near Horsham on which their new schools are to be built. The Charity Commissioners have no knowledge whether any members of the governing body dissented from the purchase. The choice was that of a governing body eminently qualified to act for the best, and the Commissioners saw no ground for withholding their assent to it.

WIND BRACING IN HIGH BUILDINGS.*

THE principles that should be observed in designing metal structures are so generally well understood, and there is such a substantial agreement among engineers as to their application, that we may reasonably expect to find every important iron or steel frame building designed in accordance with them. The greatest bone of contention in this skeleton has long been the use of cast-iron, which has been in large measure abandoned as material for bridges, but which is still extensively, though decreasingly, used for columns in fireproof buildings. There is occasion for an equally vigorous discussion of the relative merits of hollow tile walls and iron or steel rods as vertical bracing in lofty structures. The sole dependence of some architects for lateral stability in their buildings is on the ordinary partitions, weakened for such a purpose, as most of them are, by doorways through them, while others introduce stout iron rods or braces.

* A paper read by Mr. Henry H. Quimby before the American Society of Engineers, and published in *Architecture and Building*.

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There will be little question of the sufficiency of brick partitions if there be many of them, when the width of a building is a large proportion of, or is equal to, the exposed height, and the foundations are firm and unyielding or not subject to disturbance; but a building of great height, even with a good breadth, if on yielding bottom should be efficiently braced with elastic metal.

In the type of building mentioned the columns carry not only the floors and partitions, but the exterior walls, which a writer on the subject recently called "mere curtains to shield the interior." This idea of their utility is measurably correct if the metal structure is provided with efficient vertical bracing; but if, as in some cases, the bracing is omitted or inadequate, masonry of some sort must be depended upon for lateral stability. As each storey of the walls is supported on the girders of its own floor and carries no load from above, the walls are independent of the height of the building, and may be only 13 inches thick throughout.

An office building recently erected has seventeen storeys above the pavement, giving it a height of 200 feet, and is only 60 feet wide. The party walls, which are abundantly able to stiffen the building in the direction of its length (180 feet), are 18 inches thick, presumably because of municipal requirements intended to prevent the spread of fire and contemplating the support of joists. The rear wall and the walls of a 25-by-80-foot recess, or court, at one side are 13 inches thick, but are little more than window-frames because of the needed provision for light. The front from the third to the fifteenth floors is also brick, and has two bay windows, the walls of which are 13 inches thick, but, being bowed and of trifling width between the windows, they would offer very little resistance to a lateral force. The lower two and upper three storeys of the front are of stone and terra-cotta respectively. The vertical bracing consists solely of the interior partitions, which are 8 inches thick, built of hollow boxing tile with four webs each 9-16ths of an inch thick, giving a total net thickness of 2½ inches. At four points 40 feet apart these walls, in a space 17 feet wide, are continuous and without doors or other openings from the third floor to the roof, being apparently the main reliance for lateral stability, most, if not all, the other partitions being greatly weakened by passages and windows. The building towers above all its neighbours (the tallest in the vicinity being about six storeys high and one immediately adjoining only five storeys), a fact of moment in estimating the force of the wind.

In the same city, a few blocks away, is a building partially

completed, designed to have the same number of storeys as the one first mentioned, but with a width of about 150 feet. It has provision for vertical bracing in the shape of double 6-inch eye-bars and 15-inch heavy channel struts, contrasting very sharply with the other. In both buildings the columns of each tier abut against those of the lower tier, with an intervening plate which forms a seat for the floor girders. The tiers are bracketed together with angle iron or bent plate lugs, a detail that is sufficient to prevent lateral displacement, but, because of the elasticity of the bracket in bending, and the large ratio of height to base of column, contributes very little to the rigidity of the structure. This will be seen by computing the stiffness of the brackets and by considering that the workmanship is never so perfect that a number of columns could be piled up end to end, without fastening, like children's blocks, which fact indicates that as the columns are always necessarily plumbed—temporary adjustable braces being used if there are no permanent ones—the faces are not all in perfect bearing, more especially as the plates between them are not planed and are consequently somewhat uneven, a condition which presumes some initial bending in the brackets and consequent slight initial lateral strain on the bracing.

The action of the wind against the side of a building produces the effects of overturning and shear, both greatest at the highest point of external resistance, which is the roof of an adjoining building, if there be any, or otherwise the surface of the ground. The overturning or the lift on the windward side is likely always to be less than the resistance of dead weight, but the shear is liable to be overlooked, and is probably the immediate cause of the collapse of most of the buildings destroyed by wind. In the type of structure under consideration the shearing action tends to topple the columns and crush the partitions or rupture the bracing, all in one storey. The column fastenings described are not stiff enough to prevent a slight movement of the tops of the columns, which can be firmly held by the bracing alone. If this bracing is mortared work its cohesiveness is liable to be gradually destroyed by severe vibrations or many successive impacts of pressure; and if once its hold is loosened its deterioration will be rapid.

The wisdom of depending on these tile partitions in exposed buildings is doubtful. The crushing strength of the material as tested in small pieces or single bricks, while varying according to the composition of the clay or process of manufacture, in no reported case much exceeds 7,000 lbs. per square inch of net section. Inquiry of manufacturers has failed to elicit any



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information as to the strength of a complete wall, and as these tiles are easily broken in handling and laying, they are far more liable to serious and destructive flaws than iron or steel, and consequently any "factor of safety" adopted for their use may, with more reason than in the case of structural iron, be called a "factor of ignorance."

What intensity of wind pressure it is proper to assume in designing a large and high structure is an important question. The forces which we have to deal with here are not, as in other departments, limited and known, and the practice must be to some extent empirical. The experiments of the Forth Bridge engineers, and also those made by builders of wind engines, show conclusively that the pressure per unit of surface is less over a large area than over a small one, and probably the ascertained proportion of decrease will fairly apply to the large surface exposed by a great building. But the many instances of extensive and not lofty brick and stone buildings blown down are warnings against a too liberal allowance here, for a downward current of air will be deflected by surrounding low roofs or ground and accumulate intensity. The writer remembers a case of the demolition of a window by wind near the ground, which occurred at a moment that he happened to be looking at the particular spot. The locality was such that the force of the wind might become, and doubtless was, concentrated.

We do know that the wind sometimes develops an energy which must be far beyond what has ever been measured, and the efforts of investigators by means of artificial and confined currents of air have failed to obtain velocities and attendant pressure sufficient to account for some of the feats of the natural article. While we cannot know nor be expected to build against its utmost power, the experience we have ought to induce us to estimate high velocities of wind and use low intensities of strain in materials. From 30 to 50 lbs. per square foot will blow in ordinary windows. Violent storms not sufficiently destructive to be dignified with the title of tornado have registered pressures as high as 50 lbs. They are rare, but possible everywhere, and would probably give, over a large surface, at least 40 lbs. per square foot.

In view of the constant liability of any locality to the occurrence of wind storms of destructive violence and unknown force, every tall building should be assumed to be subject to a wind pressure of 40 lbs. per square foot of exterior wall-surface, and be braced to resist this with iron or steel rods or stiff braces strained not over one-third their ultimate strength.

The stability of the individual columns in a framed structure is an element of resistance of considerable value if the connections are rigid. Even with the connections described above much ultimate resistance can be counted on from the bracketed fastenings and dead load, the ratio of base to height of each column being commonly about twelve, but because of imperfect workmanship referred to above they may at first act with, instead of against, the destroying force, and their resistance be developed only after that of the partitions is overcome or impaired. Wherever adequate rod bracing is not employed the columns should be joined together by complete splices, making each column a unit throughout the whole height of the building, and then failure could only follow the bending or breaking of the body of it at two points.

The foregoing observations have been confined to the effect of wind, but any force operating to produce violent or frequent shocks, and consequent vibrations of buildings or foundations, should be carefully regarded and as far as practicable provided against. Close proximity to the track of a steam-road, elevated or surface, but more particularly the elevated, because of the concentration of span loads, may subject a building to destructive vibration, and the pulsations of engines or machinery, dynamos or elevators, are even more likely to be a serious menace, because of closer contact and more violent shocks. The introduction of isolated electric lighting plants and elevator machinery makes the subject worthy of thorough study, and the possibility of future construction of elevated railway lines through cities is a legitimate consideration in designing towering structures, particularly in places where foundations are laid in yielding soil like that of Chicago, where settlement must be looked for, and where it is probably hastened by vibration impacts. In such localities dependence on hollow tiles for lateral stiffness may be perilous, because light masonry readily succumbs to repeated shocks, and any unequal settlement is certain to injure such walls to some appreciable extent, and probably enough to impair their efficiency in the direction of rigidity. A certain high building on such soil was found before completion to have settled unequally several inches, and consequently was seriously out of plumb. Fortunately it was braced with adjustable rods, which were used to draw it back into a vertical position, and because of these rods no alarm is felt for it. The unequal subsidence was attributed to an injudicious proportioning of the foundation areas under the different columns, which sustain varying ratios of live to dead load. The necessity for the exercise of judg-



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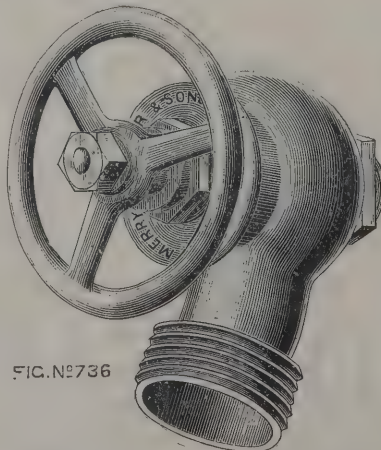


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ment in determining such proportions is an intimation of empiricism in the business of designing, and is an additional argument for avoiding uncertain materials in construction.

Another force that is entitled to respect, but is usually ignored in our latitude, though liable to be active at any moment and most powerful to destroy, is earthquake. A notable building in San Francisco has iron plate web bracing from top to bottom, designed as provision against seismic disturbances, which are more frequent on the Pacific coast than in the East, though rarely severe. No part of the country can claim immunity from them, as the experience of a few years past shows, and even slight shocks are destructive to brick masonry of low buildings, while the effect of the undulations of the earth's surface increases rapidly with the height above the ground. The only absolute security against danger from this source is in a system of bracing with some elastic material of positive strength that will so unify a structure that it will hold together even to the point of being overturned bodily, a quality which an enthusiastic writer claims offhand for steel skeleton buildings in general, but which is probably not possessed by any yet built. A reasonable degree of security against injury from any of the causes mentioned can be obtained with the above suggested provision for wind strains, care being always taken that all details, fastening of bracing, &c., are equal in strength to the main members and competent to properly transmit components of stress.


The buildings which are probably most deficient in wind bracing are those used for manufacturing. They are not as high as some others, although in cities they are increasing in height with the value of the ground, but they are often isolated, and always have large floor areas without partitions, and are stiffened only with small gusset braces or knees, which are sometimes inadequately fastened. The regular vibrations of the machinery loosen the hold of the floors upon the walls, and set up destructive movements that make it not strange that when an occasional tornado finds one of these structures in its path a disaster with appalling loss of life results.

This paper is submitted for the purpose of calling attention to some common faults in designing important works, with the hope that interested members of the profession will record, in the shape of discussion of the points involved, their judgment and observation, to the end that more uniform and improved methods of construction may prevail, a result that will certainly follow a thorough ventilation of the subject.

HOUSING OF THE WORKING-CLASSES IN EDINBURGH.

AN inquiry has just been held in Edinburgh by Lieutenant-Colonel Bailey, R.E., with reference to the application of the Town Council to the Secretary of State for Scotland to make a provisional order, under the provisions of "The Housing of the Working-Classes Act, 1880." According to the *Scotsman* the following evidence was given:—

Mr. Cooper, the burgh engineer, described the strenuous efforts of the Town Council, especially in recent years, to put the slum districts into better condition. During the last eight years 1,300 houses had been ordered to be closed, and close upon 1,000 had been improved, but notwithstanding the Council had failed to effect a satisfactory improvement, owing to the difficulty of dealing with subjects built so closely together and to such a height. He had no difficulty in selecting the areas scheduled as the plague spots of the slums. Each contained several houses which had baffled attempts at improvement. The quantity of land in each area was as follows:—A, 501 of an acre; B, 285 of an acre; C, 150; D, 1753; E, 813; F, 542; G, 147; H, 074; J, 180; K, 1683—in all, 6,128 acres. He had ascertained the number of persons who would be displaced to be 2,712. He was of opinion, however, that all these persons could be housed in or near the existing areas, where there were about 900 available houses, with rentals of from 6l. to 10l. The cost of the acquisition of the properties was estimated at 94,930l., and the cost of taking down, laying out and paving was estimated at 15,603l.—in all, 110,533l. Taking the areas in detail, area A, Campbell's Close, was the most insanitary and troublesome in the Canon-gate. The local authority had in the past dealt with nearly every house, and he attributed their want of success to the bad internal arrangements, the long, dark, tortuous passages, the unwholesome smells to which the number of unoccupied houses contributed. There were ninety-five houses to be taken in this area, and the number of houses proposed under the scheme was about the same, so that the persons displaced could ultimately be reinstated. The cost was estimated at 9,655l. It was the opinion of the Town Council, and it was his opinion, that a permanent improvement on the areas in question was impossible, and accordingly the Corporation scheme was one of reconstruction, by which a number of new tenements would

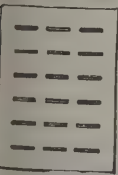


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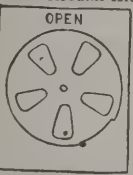
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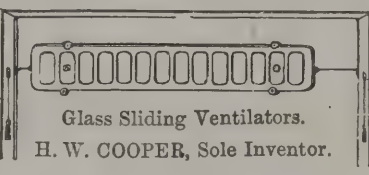
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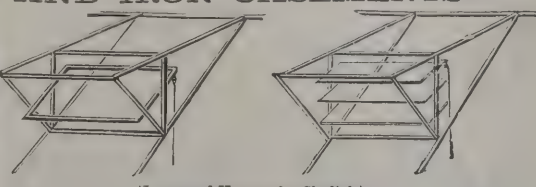
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be erected, and others would be rearranged and improved. The Corporation would insist upon the new houses having independent accesses, and so far as possible plenty of light and air, and sufficient sanitary conveniences. Area B, which lies between the Cowgate and the High School Yards, was one of the most insanitary, overcrowded and generally wretched in the city, and he attributed that condition to the height of the buildings and to the want of light and air. Nothing in area B would be sufficient in order to remove the character of unhealthiness from it, short of complete clearance and reconstruction. The Public Health Committee of the Town Council were at present considering whether the ground in question should not be used for the extension of the City Hospital, and if that were decided upon a total clearance of the area would be necessary. There were thirty-five families still living in the area, and there were in it twenty-seven condemned and uninhabited houses. The cost of the acquisition and demolition of the property scheduled was estimated at 4,500*l*. In area B the Corporation did not see their way to provide reinstatement of the persons displaced *in loco*, but in the adjacent wards there were hundred of empty houses suitable for the people as regarded rent and situation. In area C, which includes Jackson's Close and Craig's Close, the proposal was to clear away a number of obstructions between the different properties, so as to give adequate light and ventilation to others adjoining, and also to the closes. In that area they were sacrificing a certain number of houses in order to give light and air to the rest. The estimated cost of acquisition and of clearing out the property was 5,621*l*. The remarks as to reinstatement of people displaced in the neighbourhood which he made in regard to area B applied to C also. In area D—between High Street and Cowgate, east of Blair Street—there were six narrow, dingy, dirty and precipitous closes, and there were a number of overcrowded and badly arranged tenements with defective sanitary conveniences.

Miss Burton, I believe, has done good work in this neighbourhood, and I suppose that her house, if it stood alone, would not be interfered with?—Well, it is not a beauty. It towers above its neighbours, and uses the light and air which belongs to other people.

But the upper storeys are quite sanitary, I presume?—Yes, the houses up there are sanitary.

But the house forms part of an insanitary area, and therefore it must, under the statute, come down?—Yes. Mr. Cooper went on to explain the manner in which the Corporation pro-

posed to build on area D, and said the district would not only be benefited by the clearance of the existing property, but by the erection of model houses for the class of people who occupied it. By the scheme 199 families would be displaced, and it was proposed to provide 174 new houses. The balance of the population would be provided for in the empty inhabitable houses in the locality, of which there were plenty. The estimated cost of clearing the area, and of preparing the ground for the new tenements, was 27,810*l*. In area E—at Potterrow—seventy families would be unhoused, and the Corporation hoped to provide accommodation for them *in situ*. The estimated cost of taking down and acquiring the scheduled property in that area and of widening the street and providing for reconstruction was 12,200*l*. In area F, embracing the Lawnmarket property, it was impossible to make a satisfactory improvement without a clearance. He had seen plans that would provide for the whole population in the new buildings. The total cost of acquisition was 17,475*l*. There were 38 houses in area G, which is between Lawnmarket and Victoria Street. It was mainly a clearance area, the object being to admit proper light and air to the adjacent properties and the public courts. Twenty of the families living in the area could be rehoused in the new property to be erected, and there was accommodation for the remainder in the adjacent tenements. The cost of acquisition and of clearance in this area was estimated at 6,090*l*. In area H, between Candlemaker Row and Cowgate, the Corporation intended to rebuild, so that the people displaced would be reinstated, so far as possible, on the present site. In regard to area J, a tenement at Canonmills, there was a proposal by the proprietor to rebuild the subjects, which were unsuitable as dwelling-houses, for trade purposes. Area K—Thornbank and Ponton Street—contained 202 dwelling-houses. The area contained a number of very insanitary properties—dwelling-houses, stables, byres and other buildings. The general condition of the streets and properties was filthy. The properties were worn out, and others, not so far through, were very badly arranged internally. By the proposed rearrangement the greater part of the street, Thornbank, was widened to 30 feet, and a new thoroughfare was formed to Tollcross in continuation of Penton Street. The further advantage of the widening of Fountainbridge would be obtained by the scheme. All the families displaced would be reinstated on the area. The estimated cost of acquisition and of clearance in area K was 23,300*l*.

Mr. W. Hamilton Beattie, architect and civil engineer,

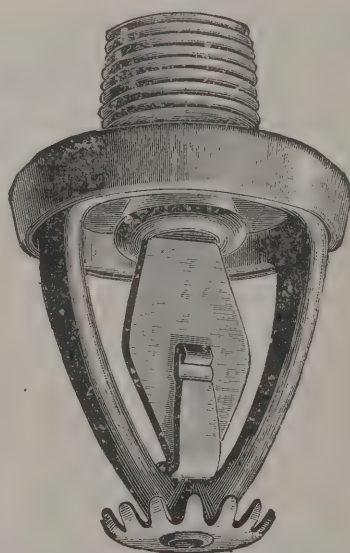
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stated that, from his intimate acquaintance with the carrying out of the Improvement Scheme of 1867, he could speak not only of its urgency at that time, but of its highly beneficial effect both upon the districts directly operated upon, and upon the general sanitary condition of the city. It reduced the death-rate of the city about one-third. Of the people who were displaced by that scheme, a considerable proportion went out to healthier houses in the suburbs, others moved into large old houses in the neighbourhood which were thereupon subdivided to suit them, whilst others settled in the new houses which were erected within the improved areas. The subdivision of these old houses had brought about an overcrowded and undesirable state of things sanitarily, and in that view the present scheme appeared to be the natural and necessary sequel to the scheme of 1867. He had examined the buildings in all the areas now scheduled, and his opinion was that they were either absolutely unhealthy houses, or were what might be called obstructive houses, which it was necessary to remove for the sake of obtaining light and air. He had considered the scheme of reconstruction proposed by the burgh engineer, and he thought it was judicious and sensible. If it erred in any way, he thought it was in endeavouring to provide more accommodation than he (the witness) might be inclined to provide; he might be disposed to give rather more open space. He was prepared to agree with the proposed reconstruction in areas D (between High Street and Cowgate, west of Blair Street) and K (the Thornybank district)—the only two areas about which there was any question. He was of opinion that the burgh engineer had anticipated criticism as to area K, because he had prepared an alternative plan of reconstruction, which the witness explained to Colonel Bailey and Mr. Blair. Replying to Miss Burton, he stated that he knew her tenement in area D, and that in the sense of the Act he thought it was insanitary. It had no ground attached to it; it was dependent for its light and air to a considerable extent on other people's ground, and it was much higher than would be allowed by modern legislation. Further, the passages were very dark. Answering Colonel Bailey, Mr. Beattie said he understood that the plans for reconstruction were purely tentative, but so far as present information went he approved of them generally. No doubt improvements might be made, and no doubt that was the intention of the Corporation. It might be of benefit if the Corporation consulted qualified professional men before finally approving of the scheme. Possibly there might be an increase of rental in the new buildings of 25 per

cent. Replying to Mr. Comrie Thomson, the Witness said that all the people who would be displaced by the carrying out of the scheme would not necessarily have to go into new and more expensive houses; there were empty houses in certain localities.

Mr. Thomas Laing, burgh assessor, Edinburgh, stated, in answer to Mr. Comrie Thomson, that, in company with Mr. Allison, house factor, he had carefully gone over and valued all the properties in the approximate valuation of 94,740*l.*, made up as follows:—A, 7,250*l.*; B, 4,500*l.*; C, 4,100*l.*; D, 19,200*l.*; D 1, 1,910*l.*; D 2, 700*l.*; E, 6,797*l.*; E 1, 4,403*l.*; F, 15,475*l.*; G, 5,670*l.*; H, 1,125*l.*; J, 550*l.*; K, 21,505*l.*; and K 1, 1,555*l.* He had also prepared tables as to the number of occupied, unoccupied and uninhabitable dwelling-houses within these areas as at November 1892. The number of habitable unoccupied houses in the thirteen wards of the city as at Whit-Sunday 1892 was 2,812, of which 802 were under 6*l.* rental, 712 between 6*l.* and 10*l.* rental, 705 between 10*l.* and 20*l.* rental, and 598 of 20*l.* rental and upwards. Replying to Mr. Blair, witness stated that in area K he had adopted from nine to eighteen years' rental as the basis of his valuation.

Mr. James Waterston, builder, examined by Mr. Blair, stated that he had had much experience in valuing all kinds of property, and had had a good deal of experience in sanitary matters. He had recently examined 34 South Ponton Street. The property was in fair repair, rather above the average of its class of property.

Q.—As to the sanitary conditions there, what do you say?

A.—I think it might have been better if there had been less. There is too much sanitation. There are five closets for six small houses. He had not observed anything as to the prevalence of disease.

Q.—As regards any defects which may exist, could these easily be remedied by the expenditure of a little money?

A.—Well, I don't suppose the property is more than sixty years old. It is in good repair.

Q.—Is it property that can be described as insanitary?

A.—No.

Cross-examined, the witness said that a portion of the property was practically back to back to another house.

Q.—Is that an advantage or disadvantage?

A.—Rather a disadvantage.

It was not, he further stated, considered good sanitation to have access to a closet through a living room.

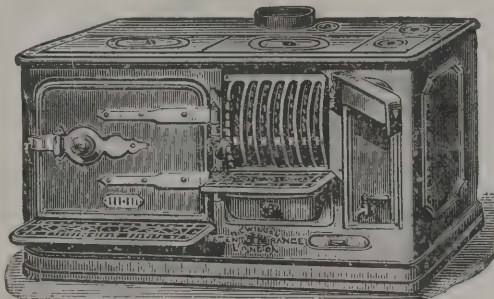
The report of Lieut.-Col. Bailey will be forwarded.

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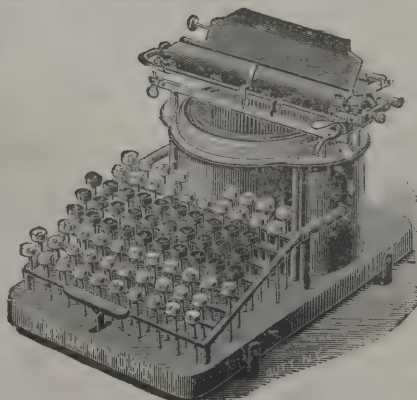
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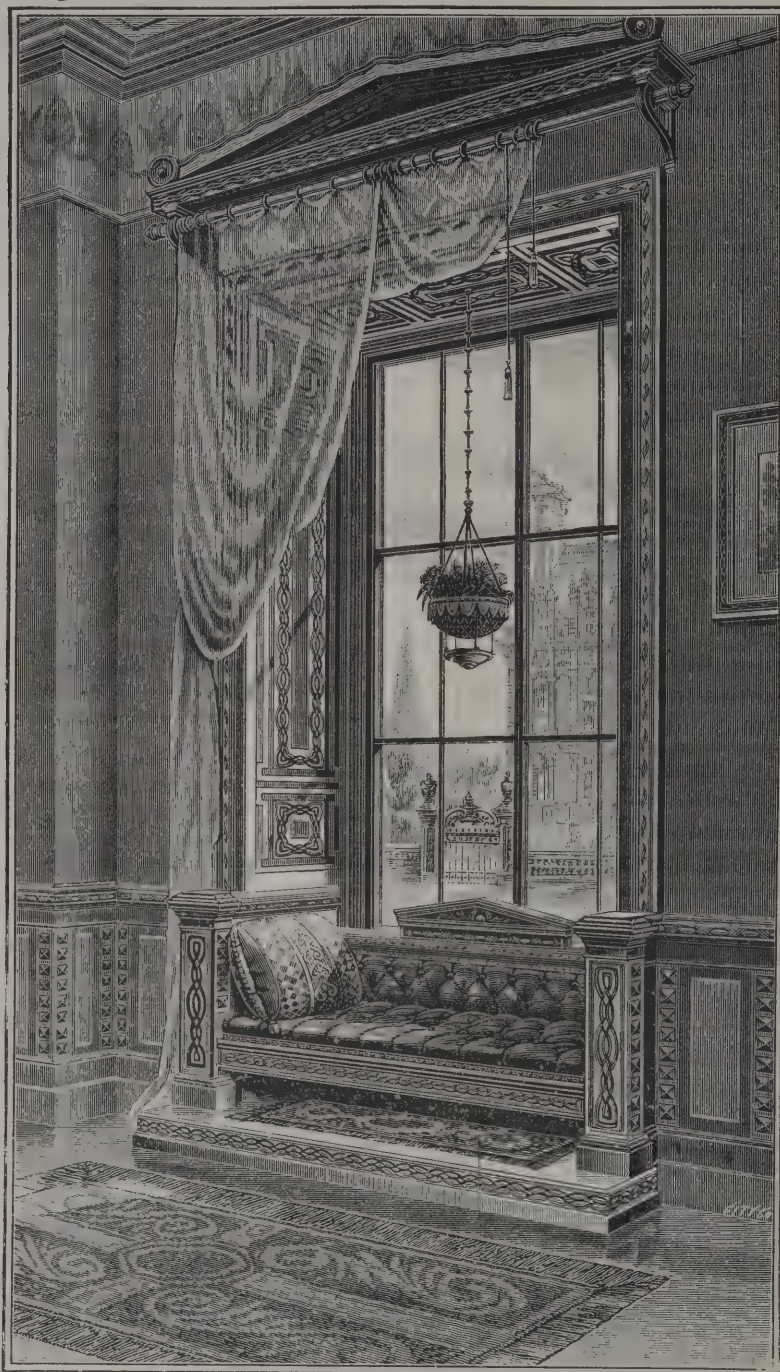
SOUTH AFRICAN EXHIBITION, KIMBERLEY

NOVEMBER 1892.

WOODWORK AS A DECORATION FOR THE HOUSE.

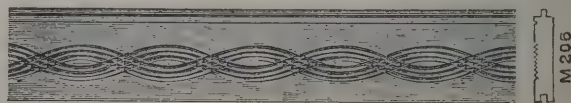
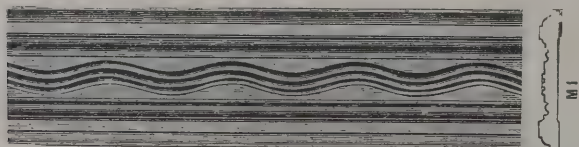
WE shall be doing a service to our readers by calling their attention to the mouldings and other finished woodwork designated "Goehring" of Messrs. J. M. Bennett & Sons, of Manchester, the old-established and well-known firm of timber

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merchants, who have the sole right to manufacture "Goehring" in Great Britain, Ireland, &c. It is a process effected by use of Dr. C. L. Goehring's geometrical wood-moulding machinery, and the most excellent artistic results are obtained in the mouldings, all of which are cut out of solid timber. Messrs. Bennett & Sons have prepared an illustrated catalogue which should have

quite possible that by means of "Goehring" the same beautiful effects may be produced in ordinary buildings with probably no more expense than other methods that require renewing periodically. Some important structural details given in the catalogue show how difficulties of common experience in fixing woodwork are done away with. The designs shown throughout



a place in every architect's office. It is a very handy size, beautifully got up, contains a mass of useful information, and evidently no pains have been spared in its preparation. Even the cover has been utilised, and shows a handsome dado in relief. We believe it is intended to shortly issue a still more elaborate catalogue. In the present one, however, nothing appears to have escaped notice by the compiler, and it quite deserves to be called a treatise on ornamental woodwork.

are excellent, and "Goehring" is well illustrated as used for ceilings, dados, staircases, furniture, and other fittings. Elaborate counters for banking premises, newspaper offices, luncheon bars, handsome mouldings, cornices, door panellings, &c., even to picture-frames, can have "Goehring" advantageously applied. The process has also this advantage that the mouldings do not cut up to waste, as the smallest odds and ends can be utilised for ornamental purposes. Specimens and samples

of "Goehring" and a variety of the designs can, we understand, be seen at Messrs. O'Brien, Thomas & Co.'s, Lion Wharf, Thames Street, London.

The illustration shown, specially prepared and here published for the first time, will give an idea of the adaptability of the material. The smaller engravings are selected to show the effectiveness of the mouldings, without reference to any particular one among the variety of excellent designs.

HARBOUR WORKS AT VENICE.

THE last report of the British Vice-Consul at Venice describes the works at Lido Port:—The long and narrow island which goes from north to south as far as Malamocco Harbour is, he says, called Lido. Pietro Giustiniano states that there were there two high towers older than Venice, which the Venetian writer Bernardo alleges to have seen with his own eyes. The first record of the port of Lido is a description of the departure in 998, on Ascension Day, of the Venetian fleet, which subsequently defeated the Dalmatians and established the supremacy of Venice in the Adriatic. The Doge was honoured with the title of Duke of Dalmatia, and from that time forward the famous ceremony of the betrothal of the sea was celebrated every year on Ascension Day in the port of Lido. About 1202 the Venetian fleet, under the command of the Doge Enrico Dandolo, consisting of 240 ships of war, 70 transports, 50 galleys, and about 150 "palandre," left the Lido with troops on board, bound for the conquest of Constantinople. It is evident from the departure of such a powerful fleet that the port was at that time deep, wide and easy of access. But in subsequent centuries the conditions changed, for a decree was issued by the Republic permitting ships to throw their ballast overboard before entering in order to pass through more easily. In the fourteenth century vigorous attempts were made to deepen the port by means of barges and men, and by making the mouth of the river Brenta flow into the port. In 1402 1,000 men were employed to excavate a bank which had formed near the entrance; but all the efforts were of no avail, as in 1541 only small craft could go out of the port. Gradually, however, it was naturally deepened, and during the last period of the Republic the galleys found easy entrance and exit through the Lido waters. The new works for the reopening of the port began several years ago. The construction of the north-east breakwater, which starts from the point of Treporti, was

commenced in 1882. It is to be 3,450 mètres long, of which 2,900 have already been constructed. The building of the south-west breakwater, which starts from the Port of Lido, began in March 1889. It is to be 2,850 mètres long, of which 1,450 mètres have been completed. The two breakwaters jut out to the sea, forming at their extremity a mouth 900 mètres wide. The construction of the portions under water is of ashlar blocks of Istrian stone and stone from the hills in the province of Padua, while the upper parts are composed of large artificial blocks of pounded stone and "pozzuolana." About 1,500 mètres distant from the seashore there is a bar running parallel to it. Owing to the construction of the breakwaters a channel was cut by the current through the bar about five mètres deep at low tide and of a breadth varying from 100 to 250 mètres. Gas conical buoys have been moored at sea opposite the breakwaters to mark their extreme limits. The buoy marking the north-east mole exhibits a fixed red light of the range of $5\frac{1}{2}$ miles, while that marking the south-west pier exhibits a fixed green light of the range of $4\frac{1}{2}$ miles. Fort San Nicolo light has been discontinued, and the white bell buoy previously marking the extremity of the north-east breakwater has been withdrawn. Although the works will not probably be completed before 1895, it is expected that next year the Lido Port will be rendered navigable for the largest vessels. Two large Italian merchant steamers and an English steamship have already gone out of the port at high tide in charge of pilots. The estimate of the expenditure is 240,000*l.*, but it is expected that a much larger amount will ultimately be laid out by the Italian Government.

BUILDING TRADES EXHIBITION.

WE would call the attention of our readers to an announcement made in our advertisement columns, that the eleventh annual Building Exhibition will be held during the weeks from March 11 to March 25 at the Royal Agricultural Hall, Islington. No pains will be spared to secure for the exhibition a perfectly representative collection of products, appliances and machinery used in the building trades, and we trust that as usual all the well-known firms who have so successfully catered for the needs of architects and builders' will be well represented. Applications for space should be made at once to Mr. John Black, secretary, at the Exhibition Offices, 2 Newcastle Street, Strand, W.C.

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REGISTRATION OF PLUMBERS.

THE plumbers of the Manchester district registered in connection with the Worshipful Company of Plumbers, London, held their annual meeting on Saturday at the Technical School. The president (Mr. John Holden, F.R.I.B.A.) occupied the chair. The report stated that during the past year a satisfactory increase in the number of names on the register had taken place. There had been two examinations during the year, at which five masters and twenty-five operatives had presented themselves. Of these four masters and thirteen operatives had passed, and one master and twelve operatives had failed. Amongst the principal matters which had engaged the attention of the Council was the Plumbers Registration Bill, promoted by the Plumbers' Company and introduced by Mr. Lees Knowles, M.P. A sub-committee of the Council recommended certain alterations, which were forwarded to the Company and Mr. Knowles. The Bill was ultimately referred to a select committee. Shortly stated, the desire of the Council has been (1) to ensure a representative and practical form of government for the movement, instead of the ornamental, largely irresponsible, and, in the opinion of the Council, consequently inefficient form proposed; (2) to secure autonomy for the district councils, especially in the control of their funds; (3) to provide for such discipline as would secure prompt compliance with all rules and by-laws; and (4) that no official appointments be made by Act of Parliament, inasmuch as if so made application to Parliament to enforce obedience to the governing body at any time would be necessary. The Council are wishful to give their cordial and loyal support to the Company, but reserve the right of exercising their own judgment as to the form a Bill should take which, when passed into law, would be binding upon them and their constituents in common with all other branches of the organisation. The Council trust, therefore, that when the Bill is next introduced the provisions will be so modified as to enable the Council to support it without reservation. With a view to the encouragement of study, the promotion of excellent workmanship, the observation of defective plumbing, and the cultivation of facile expression or record of the results of reading and experience amongst plumbers, a prize fund was raised. The prize essays and others of sufficient merit are to be published. The treasurer's statement showed that the receipts during the year had been 159*l.* 0*s.* 7*d.*, and expenditure 150*l.* 17*s.* 6*d.*, the balance left in the bank being 126*l.* 18*s.* 11*d.* The Chairman, in moving the adoption of the report, alluded

to the new Registration Bill brought in since the reassembling of Parliament, and which had already passed the second reading. He said the views of the Manchester Council had to some extent been considered in drafting this Bill, but there was still room for improvement. A sub-committee was appointed to prepare amendments and arrange for their being moved in Committee. The report and accounts were passed, and a vote of thanks given to the chairman for the great interest he takes in the movement.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

3137. Herbert White, for "An improved stench-trap for drains, sewers and the like."
 3173. William John Henry, for "An improved lock for trunks, boxes and like purposes."
 3258. James Emmott and Bernard Emmott, for "Improvements in chimney-pots."
 3283. William Davis, for "Improvements in tops or cowls for chimneys, ventilating shafts or the like."
 3340. Harry Richardson, for "Improvements in or additions to fire-hose, branch pipe nozzles or jets."
 3379. Agnes Edith Jane Hemingway, for an "Improved window fastener."
 3442. Edward Martin, for "A combination level, bevel and square."
 3474. Enoch Pinson, for "An improvement in sash-fasteners, for the purpose more especially of increasing their security."
 3620. William John Brett and William Dingley, for "An improved automatic vent-peg."
 3639. William Oakley, for "Improvements in locks."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

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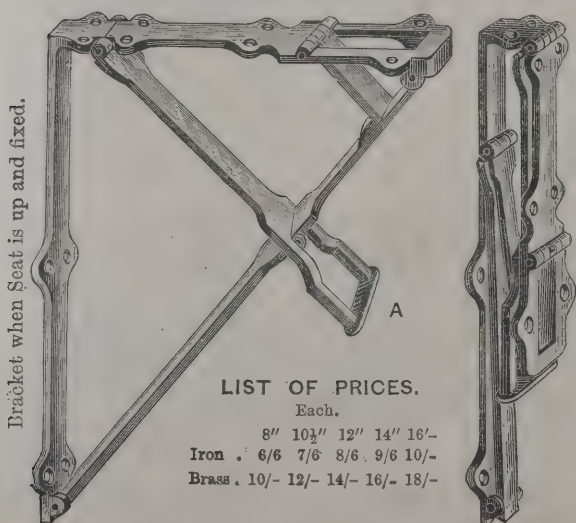
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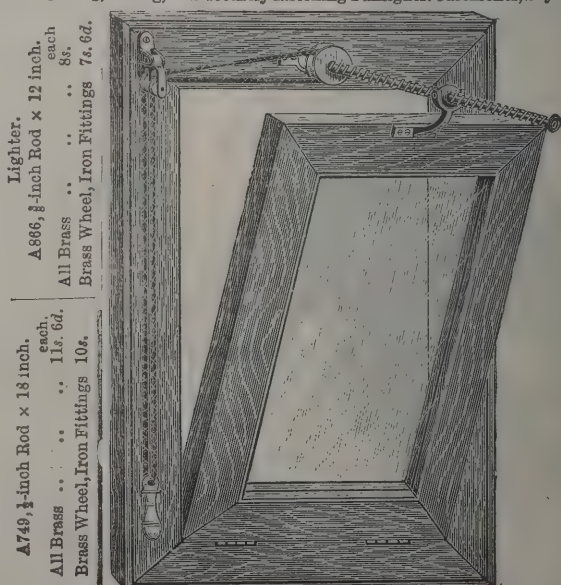
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THE Architect and Contract Reporter

TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITION OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

ABERDARE.—March 25.—For Building Intermediate Schools. Mr. John H. Phillips, St. John's Chambers, Cardiff.

ABERGAVENNY.—For Building School for 250 Children. Mr. E. A. Johnson, Architect, Abergavenny.

ACCRINGTON.—March 14.—For Building Methodist School Chapel. Messrs. Haywood & Harrison, Architects, Accrington.

ACCRINGTON.—March 15.—For Building Banking Premises. Messrs. Waddington & Son, Architects, 5 Grimshawe Street, Burnley.

BARKING.—March 14.—For Constructing Portable Hospital Mortuary, Washhouse and Disinfecting Rooms. Mr. C. E. Wilson, Local Board Offices, East Street, Barking.

BARNSELY.—March 20.—For Building Two Houses. Mr. J. H. Marshall, 101 Lancaster Street, Barnsley.

BATH.—March 17.—For Building Postal Sorting Office. Mr. H. W. Primrose, 12 Whitehall Place, S.W.

BELFAST.—March 10.—For Building Offices, &c. Mr. Samuel P. Close, Architect, 53 Waring Street, Belfast.

BELFAST.—March 10.—For Additions to the Grove Mill. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BELFAST.—March 15.—For Construction of Lough Mourne Conduit. Mr. L. L. Macassey, Engineer. Mr. Richard Hamilton, Secretary, Waterworks Office, Belfast.

BELFAST.—For Building Three Villas. Mr. W. Batt, Architect, Garfield Chambers, Belfast.

BERWICK.—March 13.—For Construction of Cement Concrete Sea Wall at Spital. Mr. Dickinson, Borough Surveyor, Berwick-on-Tweed.

BLACKPOOL.—March 16.—For Building Hospital. Mr. T. P. Worthington, Architect, Blackpool.

BLANTYRE.—For Construction of Brick Gasholder Tank. The Manager to the Gas Company, Blantyre.

BOURNEMOUTH.—March 13.—For Supplying Cast-iron Pipes, Cradles, &c., for Outfall Works. Mr. F. W. Lacey, Borough Surveyor, Bournemouth.

BOURNEMOUTH.—March 20.—For Constructing Sewers. Mr. F. W. Lacey, Borough Engineer, Bournemouth.

BRADFORD.—March 15.—For Rebuilding Inn, and Building Four Shops and Houses in North Wing. Mr. T. C. Hope, Architect, 27 Kirkgate, Bradford.

BRIDGNORTH.—March 11.—For Alterations and Extensions at Gasworks, Provision of Certain Plant, New Main and Corrugated Iron Shed, &c. Mr. J. H. Cooksey, Town Clerk.

BRIGHTON.—March 21.—For Fitting-up Steam-cooking Apparatus at Workhouse. Mr. H. S. Reed, Guardians' Clerk's Office, Church Street, Brighton.

BRYMBO.—For Straightening Brick Chimney (175 feet high) and Refixing Lightning Conductor. The Brymbo Steel Company, Limited, near Wrexham.

BURNHAM.—March 13.—For Building Pair of Villas, with Boundary Walls, &c. Mr. C. S. Leech, Architect, Boulevard, Weston-super-Mare.

BURY.—March 21.—For Laying Cast-iron Pipes, Fixing Valves, Cocks, Hydrants, &c. Mr. J. Cartwright, Engineer, Corporation Offices, Bank Street, Bury.

BURY ST. EDMUNDS.—March 10.—For Excavation Work (Seven Miles) for Sewerage. Mr. J. Campbell Smith, Borough Engineer.

CAMBERWELL.—March 13.—For Supplying Granite, Rag Stone, Paving Stone, Tar Paving, Lime, Cement, &c. Mr. C. W. Tagg, Vestry Hall, Camberwell, S.E.

CARDIFF.—March 11.—For Building Mission Chapel. Mr. E. W. M. Corbett, Castle Street, Cardiff.

CARLISLE.—March 13.—For Building Four Houses. Mr. Henry Messenger, 71 Ashley Street, Carlisle.

CATERHAM.—March 10.—For Fixing W.C.'s, &c., Asylum for Imbeciles. Mr. T. D. Mann, Norfolk House, Norfolk Street, Strand, W.C.

CATFORD.—March 30.—For Building Twenty-three Houses. Messrs. F. & W. Stocker, 90 Queen Street, Cheapside, E.C.

CHEPSTOW.—March 13.—For Construction of Cattle Market. Mr. F. Evans, Clerk, Local Board Offices, Chepstow.

COCKERMOUTH.—March 11.—For Additions to Castle Inn and Keeper's Lodge, Armathwaite Hall. Mr. C. J. Ferguson, Architect, Carlisle.

COLCHESTER.—March 14.—For Supplying Kerbs, Flints, Ragstone, Cement, Glazed Sewer Pipes, Traps, Gullies, &c. Mr. H. Goodyear, Borough Surveyor's Office, Stanwell Street, Colchester.

CORNWOOD.—March 22.—For Building Passenger Station. Mr. G. K. Mills, Great Western Railway Company, Paddington Station, W.

CORWEN.—March 14.—For Building Two Shops and Houses. Mr. R. T. Jones, Architect, 16 West Street, Llangollen.

DALTON-IN-FURNESS.—March 21.—For Building Manual Instruction School. Mr. William Butler, Clerk to the School Board, Dalton-in-Furness.

DARENTH.—March 11.—For Repairing Roads, Gore Farm Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

DARTON.—March 14.—For Building Forty-two Cottages. The Manager, Woolley Colliery Offices, Darton.

DENBIGH.—March 14.—For Building Board Schools for 300 Boys. Mr. R. Humphreys Roberts, Clerk to the School Board, Denbigh.

DEWSBURY.—March 10.—For Building Eleven Houses, Shop, &c. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

EDINBURGH.—March 18.—For Building Bruntsfield Public School. Mr. Robert Wilson, Architect, 3 Queen Street, Edinburgh.

ELLAND.—March 15.—For Construction of Passenger Station. Plans at the Engineer's Office, Hunt's Bank, Manchester.

FULHAM.—March 15.—For Supplying Granite, Flints, Lime, Cement, Stoneware, Drain Pipes, Timber, &c. Mr. W. J. H. Denselow, Town Hall, Walham Green, S.W.

FULHAM.—April 5.—For Building Diphtheria Wards at Western Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

GLASGOW.—March 18.—For Building Sanitary Washhouse, Ruchill Park. Mr. J. Lang, Clerk to the Police Commissioners, City Chambers, Glasgow.

GORLESTON.—March 10.—For Construction of Lavatory on the Beach. Mr. J. W. Cockrill, Borough Surveyor.

GREAT CORBY.—March 11.—For Building House. Mr. Robert Lowther, Great Corby, Carlisle.

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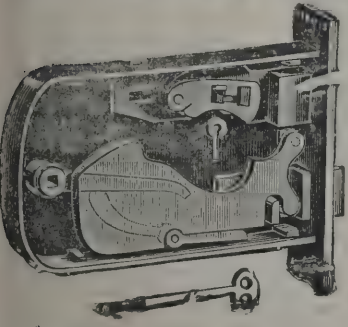
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GUILDFORD.—March 20.—For Works to Town Hall in Connection with Approach from Police Buildings. Mr. Wm. Lower, Architect, 12A High Street, Guildford.

HANLEY.—March 13.—For Buildings and Chimney Shaft (Electricity Works), Seven-ton Travelling Crane and Mechanical Stokers, and Extension of Sewage Works Buildings. Mr. Joseph Lobley, Borough Engineer.

HAXEY.—March 18.—For Repairs to South Aisle of Church. The Vicar, Haxe.

HEALEY.—March 14.—For Building Rag Warehouse. Mr. Walter Crawshaw, Architect, Branch Road, Batley.

HEMSWORTH.—March 10.—For Building Co-operative Store Premises. Messrs. Senior & Clegg, Architects, Barnsley.

HOLMFIELD.—March 11.—For Building Pair of Semi-detached Villa Residences. Messrs. G. Buckley & Son, Architects, Tower Chambers, Halifax.

HORNCASTLE.—March 14.—For Restoration of Scamblesby Church. Mr. R. H. Fowler, Architect, Louth.

HOUGHTON, HANTS.—March 20.—For Building School-Teacher's Residence, &c. Mr. John Hillary, Architect, Longparish, Hants.

KINGSTON.—March 15.—For Supplying Road Materials, Tar Paving, Stone Kerbing, &c. Mr. A. J. Henderson, District Surveyor, Thames Ditton.

LEWISHAM.—March 21.—For Constructing Brick and Concrete Sewers, with Side Entrances, Ventilators, &c. Mr. Edw. Wright, Board of Works Offices, Catford, S.E.

LIMEHOUSE.—March 20.—For Works and Repairs to Sewers, Drains, &c., for Twelve Months. Mr. S. G. Ratcliff, Board of Works Offices, White Horse Street, Commercial Road, E.

LLANARTHNEY.—March 10.—For Building Parsonage. Mr. D. Jenkins, Architect, Llandilo.

LLANDOVERY.—March 10.—For Building Vicarage at Rhandermwn. Mr. D. Jenkins, A.R.I.B.A., M.S.A., Architect, Llandilo.

LOWESTOFT.—March 13.—For Alterations and Addition to Dwellings at Lighthouse. Mr. Chas. A. Kent, Trinity House, London, E.C.

LUDLOW.—March 13.—For Supplying and Fixing Cast-iron Water Pipes, Erecting Pumping Station, Machinery, &c. Mr. W. Wyatt, Pride Hill Chambers, Shrewsbury.

MANCHESTER.—March 14.—For Building Block of Six Artisans' Dwellings. Mr. Henry Shelmardine, Architect, Hunt's Bank, Manchester.

MANCHESTER.—For Building Five Pairs of Semi-detached Villas. Mr. Pilling, 22 Brazenose Street, Manchester.

MIDDLETON.—March 14.—For Construction of Permanent Grand Stand for the Agricultural Society. Mr. T. A. Fitton, Architect, Long Street, Middleton.

MIDHURST.—March 18.—For Rebuilding House and Show-room. Mr. Wm. Buck, Architect, 60 West Street, Horsham.

NELSON.—March 15.—For Extension of Goods Warehouse, Building Offices, &c. The Engineer's Office, Hunt's Bank, Manchester.

NEWHAVEN.—March 15.—For Building Wesleyan Chapel. Mr. Charles Bell, Architect, London.

NEWPORT.—March 15.—For Taking Down and Rebuilding Two Shops and Houses, Taking Down Three Cottages and Building Two Shops and Houses. Mr. E. A. Lansdowne, Architect, National Bank of Wales Chambers, Commercial Street, Newport, Mon.

NEWPORT.—March 21.—For Supply of Cast-iron Water Mains. Mr. Robey F. Eldridge, Town Clerk, Guildhall, Newport, Isle of Wight.

NEWTON-LE-WILLOWS.—March 20.—For Building Manager's House at Gasworks. Mr. R. Brierley, Town Hall, Newton-le-Willows.

PENYDARREN.—March 21.—For Building Forty-five Houses. Mr. J. Williams, Architect, Edward Street, Morgan Town, Merthyr Tydfil.

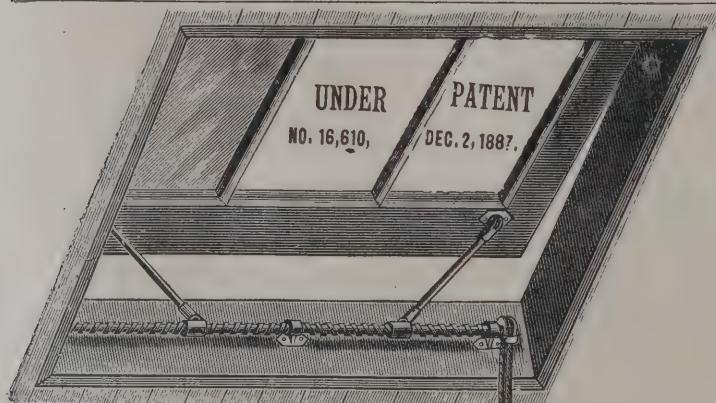
PETERBOROUGH.—For Building Villa. Mr. W. Boyer, Architect, 3 Wentworth Street, Peterborough.

PETWORTH.—March 20.—For Alterations to Workhouse, Wisborough Green. Mr. H. Howard, Architect, Littlehampton.

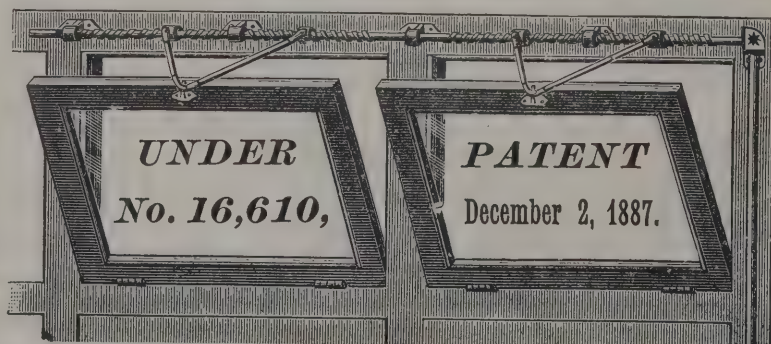
PINHOE.—March 13.—For Building House. Mr. R. Loram, Westeria, St. James, Exeter.

PIRBRIGHT.—March 20.—For Walling, Goul Farm. Messrs. Peak & Lunn, Surveyors, 36 High Street, Guildford.

PORTR.—March 14.—For Building Schoolroom for St. Paul's Church, Penrhigwent. Mr. D. Mathew Jones, Gladstone House, Porth.



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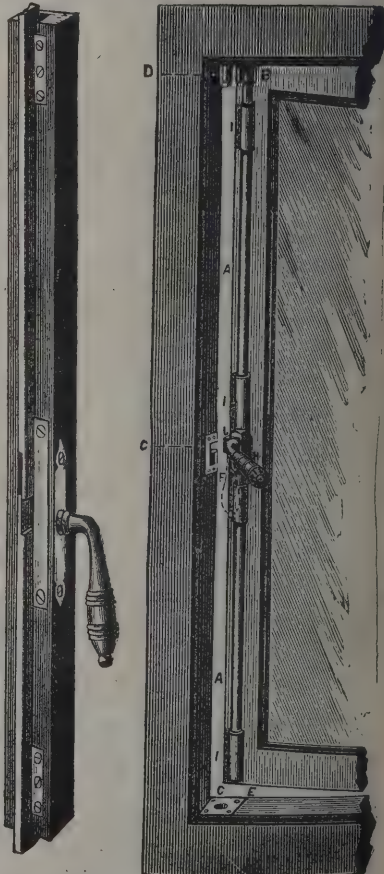
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No. 208.—Special thrust-motion round section Bolt suitable for very narrow sashes. It can be fixed where the space is insufficient for anything else. This Bolt is neat, strong, and reliable.

PORTH.—March 16.—For Extension of Hotel. Mr. J. Rees, Architect, Pentre, Rhondda.

PWLLGWAUN.—March 31.—For Building Infants' School with Outbuildings, Boundary Walls, &c. Mr. J. J. Evans, C.E., Penarth.

RAVENSTHORPE.—March 13.—For Building Twelve Houses. Mr. J. Berry, Architect, 9 Queen Street, Huddersfield.

RHANDIRMWYN.—March 10.—For Building Vicarage House. Mr. D. Jenkins, Architect, Llandilo.

RICHMOND.—March 13.—For Providing Material and Making-up Streets. Mr. E. J. Lovegrove, Borough Surveyor, Lower Mortlake Road, Richmond.

ROCHESTER.—March 23.—For Excavating, Piling, Timbering and Concreting Foundation for Retort-house. Mr. Wm. Syms, 58 High Street, Rochester.

ROTHBURY.—March 16.—For Building House, Beggar Rigg. Mr. G. Reavell, Jun., Architect, Alnwick.

SANDHURST.—March 15.—For Building Police Station. Mr. Joseph Morris, County Surveyor, 156 Friar Street, Reading.

SEDFIELD.—March 13.—For Building Medical Superintendent's House at the Asylum. Mr. W. Crozier, County Architect, Shire Hall, Durham.

SHEFFIELD.—March 18.—For Building Board School. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

SHOREDITCH.—March 14.—For Constructing Brick and Pipe Sewers with Manholes, Ventilators, &c. Surveyor, Town Hall, Old Street, E.C.

SKIPTON.—March 13.—For Building Temporary Infectious Hospital. Mr. North, Town Surveyor, Town Hall, Skipton.

SOUTHPORT.—For Additions to Church. Mr. W. E. Vernon Crompton, Architect, Moot Hall Chambers, Wigan.

SOUTHWARK.—March 14.—For Constructing Underground Conveniences. Mr. Hiscocks, Vestry Hall, Borough Road, S.E.

SUNDERLAND.—March 11.—For additions to Moor School. Mr. T. W. Bryers, Clerk to the School Board, 15 John Street, Sunderland.

SWINDON.—March 11.—For Building Workmen's Club. Mr. R. J. Beswick, Architect, Fleet Street, Swindon.

SWINDON.—March 11.—For Taking Down and Rebuilding 26 Wood Street. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

SWINDON.—March 14.—For Building Lodge, Latrines, Entrance Gates, &c., at Town Gardens. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

TAVERSTOCK.—March 21.—For Building Country House and Domestic Offices, &c. Mr. Samuel Knight, Architect, Temple Chambers, E.C.

THAKEHAM.—March 27.—For Additions to Workhouse. Messrs. Scott & Cawthorne, Architects, Brighton.

THORNHILL.—March 13.—For Construction of Engine and Boiler-house, Settling-tanks and other Buildings, Supply of Engines, Boilers, Machinery, &c. Mr. J. C. Haller, Engineer, Local Board Offices, Thornhill, Dewsbury.

TONDU.—March 22.—For Construction of Tramway Bridge over Railway. Mr. G. K. Mills, Paddington Station, London.

TORQUAY.—March 20.—For Building Brewery at Ellacombe. Mr. Edward Richards, Architect, Manor Office, Park Crescent, Torquay.

WALSALL.—March 18.—For Supply and Erection of Apparatus at the Pleck Gasworks. Mr. John Tindall, Gas Engineer to the Corporation, Walsall.

WARWICK.—March 11.—For Building Sunday School and Parish Room. Mr. F. H. Moore, Architect, 2 Northgate Street, Warwick.

WEST HAM.—March 14.—For Supplying Broken Granite and Road Flints, and Paving, Channelling and Kerbing Roads. Mr. Lewis Angell, Town Hall, Stratford, E.

WESTMINSTER.—March 15.—For Building Public Mortuary, Coroner's Court, Disinfecting Chamber, Caretaker's Apartments, &c. Mr. G. R. Wheeler, Town Hall, Caxton Street, S.W.

WHAPLODE.—March 20.—For Building Chapel at Burial Ground. Mr. T. C. Willders, Clerk to the Whaplode Burial Board, Holbeach.

WHITBY.—For Building Board School. Mr. J. M. Bottomley, Architect, 28 Albert Road, Middlesbrough.

WHITEHAVEN.—March 15.—For Enlarging Works and Warehouse. Messrs. Moffat & Bentley, Architects, Whitehaven.

WOODFORD.—March 13.—For Farm Buildings, Cottages and Mortuary. Mr. R. W. Partridge, 21 Whitehall Place, S.W.

YSTRAD RHONDDA.—March 13.—For Alterations to Mardy Schools. Mr. J. Rees, Architect, Pentre.

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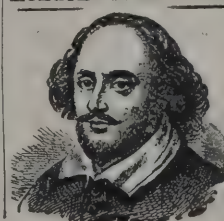
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James Dockett, Horrabridge . . . 1,538 0 0
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J. Ellingham, Bexley Heath . . . 1,981 0 0
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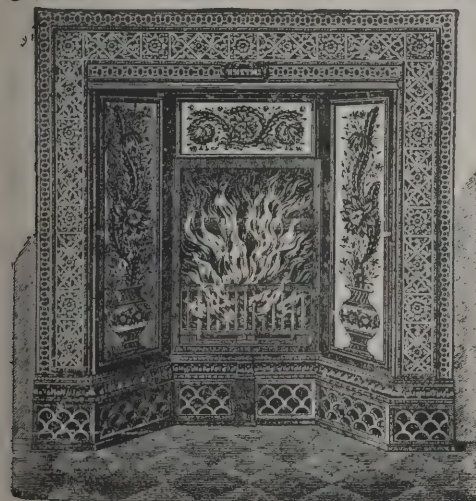
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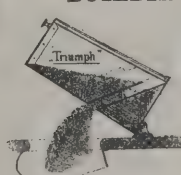
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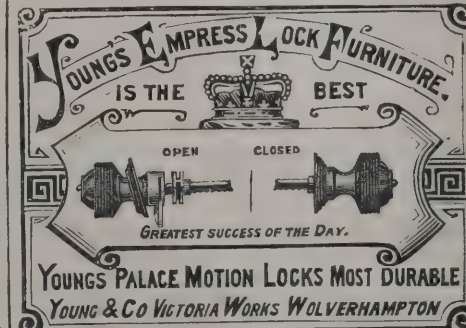
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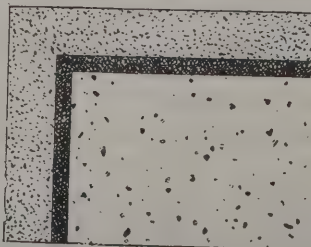
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ON Monday last the Duchess of Albany formally started the new turret clock and bell just erected in the tower of St. George's Church, Cannes, an edifice which has been built as a memorial to the late duke. A cord connected with the clockworks being severed by Her Royal Highness, the clock was set in motion, after which a service was held in the church, the Bishop of Gibraltar officiating. The clock, &c. has been manufactured and erected by Messrs. Gillett & Johnston, of Croydon, all the workmanship and materials being of the best quality. The clock is constructed to show the time on three dials each measuring 5 feet in diameter, and the bell upon which the hours are struck weighs upwards of 7 cwt. and measures nearly 3 feet across the mouth, the note when struck being slightly sharp of G. All the latest improvements have been introduced into the clock; amongst others might be mentioned Lord Grimthorpe's "double three-legged gravity" escapement, generally recognised as the best and most perfect escapement that has yet been devised. The pendulum is also worthy of notice, inasmuch as it is compensated to withstand all variations of temperature, and thus always remains the same length, upon which the timekeeping qualities of the clock in a very large measure depend. An engraved and silvered brass plate has been fixed to the frame of the clock bearing the following inscription:—"Presented to the church of St. George, Cannes, by Arthur Ussher, A.D. MDCCCXCIII." The inscription is cast upon the bell. The whole of the work has been done in a very satisfactory manner by Messrs. Gillett & Johnston, who have also now in hand large clocks and bells for Surrey County Buildings, Kingston; Messrs. Stephens's Ink Factory, Finsbury Park; and Shanghai Custom House, Bermuda Session House, St. Andrew's Kirk, Bangalore, &c. &c.

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

Price, £1 10s. and upwards. Portable Filters on this System, £1 5s. to £3.

Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Bagshot Park, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession, and at the London, Middlesex, St. George's, St. Mary's, Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4s. 6d. and 6s. each. Household and Fancy Filters, from 10s.

Water-Testing Apparatus for detecting Impurities in Water, 10s. 6d. and 21s. each.

157 STRAND, W.C. (Four Doors from Somerset House), LONDON.

Awards Obtained:—LONDON, 1862, 1874; PARIS, 1867, 1878, &c.

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147 STRAND, LONDON, W.C.

numerous borings into the chalk of the London basin have considerably reduced the level of the springs of late years, so that most wells have ceased to overflow. That this source of supply is, however, still copiously fed from the outcrop of the chalk has just been forcibly demonstrated by an artesian tube well which has been bored by Messrs. Le Grand & Sutcliffe, hydraulic engineers, London, at Mr. Chambers's watercress beds, Haydon's Road, midway between Wimbledon and Tooting. The depth bored is 166 feet, reaching about 30 feet into the chalk formation, upon penetrating into which the water rose 17 feet above the ground, and the overflow at surface level is at the rate of no less than twenty-two tons of water per hour.

A NEW turret clock striking the hours on the large or tenor bell, and showing the time upon one external copper dial 4 feet in diameter, with copper hands, all being well painted and gilt, has recently been erected in the tower of the parish church, Draughton, near Northampton, by Messrs. W. Potts & Sons, clock manufacturers, Guildford Street, Leeds, the work being of the very best quality and finish, and the clock-dial and hands have a neat and effective appearance. The new dial faces towards the south, and is far more useful to the inhabitants than the old clock dial, which was on the west side. The donor of the clock is Mr. Reginald B. Loder, Maidwell Hall, Northampton, Messrs. St. Aubyn & Wadling, of Lamb's Buildings, Temple, London, being the architects. Messrs. Potts & Sons are also making new clocks for Wortley Church, Sheffield; Hartlepool parish church; Yorkshire Penny Bank, Bradford; Thurlestone, near Penistone; Oldham, and other places.

THE Public Parks Committee of the Edinburgh Town Council have accepted estimates, amounting to about 400*l.*, for the construction of a bowling-green in the East Meadows Park.

MUCH to the convenience of those having business to transact in the Liverpool Municipal Buildings in Dale Street, a lift worked by hydraulic power has just been placed in the buildings by Messrs. Waygood, of London.

THE Paisley Water Commissioners have placed the contract for the construction of the boundary wall, filter bed and laying of cast-iron pipes in connection with the new filter at Craigenfeoch in the hands of Mr. R. B. Stewart, Saltcoats, the price being 857*l.* 4*s.* 10*d.*

THE Chester Town Council have passed a recommendation of the Joint Public Health and Sewering Committees in favour

of purchasing about 418 acres of land, at a cost of 27,000*l.*, for use of a sanitary depôt in connection with the city sewerage. Sanction from the Local Government Board will be applied for for raising the money.

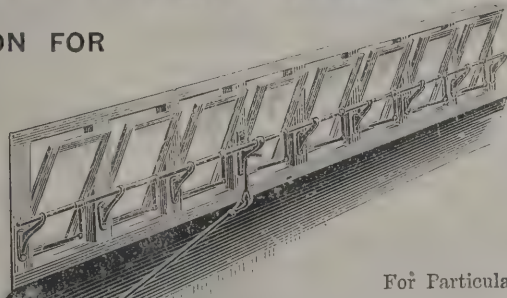
CHICAGO EXHIBITION NOTES.

AN exhibit of wall-papers has been prepared by Messrs. W. Woollams & Co., of 110 High Street (near Manchester Square), London, W., manufacturing paper-stainers, the original makers of artistic wall-papers free from arsenic. Their stand is an irregular parallelogram facing four avenues, each side divided into three sections. Among the decorations are the "Tanhope" frieze and filling, in blue and gold on light yellow ground, with dado; "Viterbo," in embossed and lacquered leather, designed by Miss Louisa Aumonier; the "Chatsworth" frieze, filling and skirting border, designed by Mr. T. W. Hay; the "Westminster" frieze and filling, designed by Mr. A. Silver, with the "Osaka" dado, embossed and lacquered leather, designed by Mr. F. Darling; the "Tweeddale" frieze, acanthus and honeysuckle, in transparent colours on mica ground, and the "Darnley," acanthus and peony, similarly treated, drawn by Mr. G. F. Catchpole, with dado "Ostiglia," in coloured flock on lacquered gold ground, designed by Mr. T. W. Hay; the "Rosebery," a bold design in flat treatment, designed by Mr. C. F. A. Voysey, and worked by a new process in variegated flocks, producing novel and beautiful effects of broken colour; with a dado, the "Cleveland," in coloured flocks on a lacquered gold ground, designed by Mr. T. W. Hay. Right side:—The "Acanthus" frieze, the "London-derry" filling, a fine combination of hollyhocks and lace, designed by Miss Louisa Aumonier, with the "Rhône" dado, in warm coloured flocks on a lacquered gold ground, by the same designer. Another frieze, designed by Miss Louisa Aumonier; filling, the "Cordova," designed by Mr. T. W. Hay, and the "Morton" dado, designed by Mr. Owen W. Davis, all worked in patent embossed flocks on lacquered gold grounds with delicate effects of modelling in low relief, and several other friezes, one designed by Mr. W. H. Noble; also a variety of ceiling papers.

THE British section at the World's Fair will be decorated in part by some seventy banners bearing respectively the arms of different municipal corporations in the kingdom.

REDUCTION IN PRICE OF LEGGOTT'S PATENT ADJUSTMENT for Opening and Closing Fanlights and Skylight.

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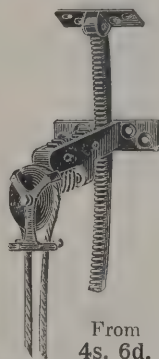
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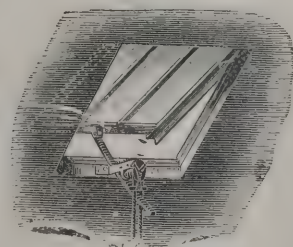
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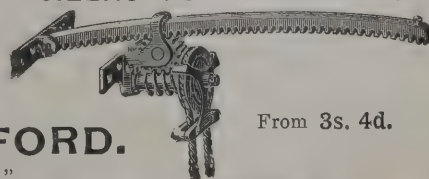
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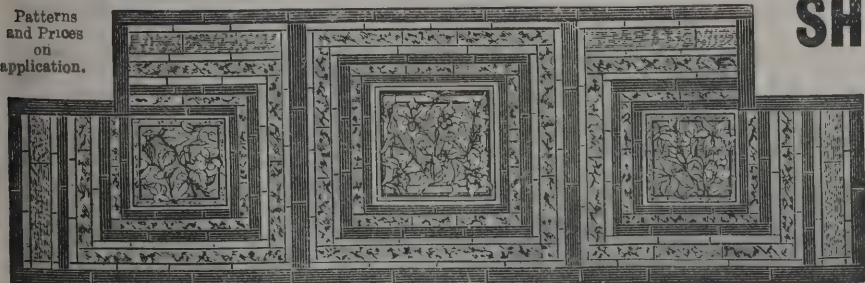
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THE "White City," as the World's Fair grounds and buildings are termed, has the equipment of a model municipality. It has a combined water capacity of 54,000,000 gallons a day, and will soon have 100,000,000. It has 25 miles of water mains and 291 hydrants. A hundred more will be provided. There are 3 steam fire-engines, 4 chemical engines, a ladder-truck, water-tower, 40 hose-carts, 26,750 feet of hose, 1,050 hand fire-extinguishers, 2,500 fire-pails, a steam fire-boat, 65 firemen, 150 alarm-boxes, 150 patrol telephones, 500 guards, complete electric light and sewerage systems, &c.

AN English salt firm has made a salt statue, modelled after Bartholdi's *Liberty Enlightening the World*, in New York Harbour. The statue is 5½ feet high, and stands on a rock-salt base 7 feet high. The salt was taken from a mine 250 feet deep.

THE King of Siam has decided to make a display in the manufactures, agricultural and forestry buildings at the World's Fair, and will also erect a royal pavilion of elaborate carved woods.

THE list of Germany's exhibitors at the Fair contains 5,077 names. Represented in it are 230 cities and towns of the empire, and of these 40 cities send more than ten exhibits each. Berlin leads with 283 exhibitors; Munich follows with 187; Leipsic with 149; Frankfort, 55; Hamburg, 57; and Chemnitz, 41.

VARIETIES.

WE hear that Mr. W. H. Radford, C.E., of Nottingham, has been instructed to prepare sewerage and waterworks schemes for the village of Helsby, Cheshire.

BY permission of Lord Blantyre the members of the Glasgow Natural History Society, in an excursion to the Bishopston district, paid a visit to the Erskine estate, where measurements and photographs were taken of several of the finest trees. Among these was a very large sycamore, measuring 16 feet 4½ inches in girth at a height of 3 feet 9 inches from the ground. Near the site of the old house of Bargarron is the famous "Witches' Oak," which measures 18 feet 9 inches in girth.

AT a special meeting of the Kirkcaldy Harbour Commissioners held to consider the new harbour question, Mr. Blyth, C.E., who made the survey of the scheme for the North British Railway, asked to be shown Sir John Coode's plan. He was informed that Sir John Coode's plan was the property

of private subscribers, and would be handed over on payment of 518%, or a guarantee for that sum. In the event of the new Ravenscraig scheme going on, Mr. Blyth's object was to compare his borings with those of Sir John Coode, to see if the sandbanks had shifted during the last nine years.

AT the meeting of the Glasgow Town Council, a plan for a recreation-hall after the style of the Crystal Palace, to be erected on Glasgow Green, was submitted. The estimated cost was 7,000*l.*, and the site proposed in the vicinity of Cumberland Street. The plan was generally approved, and it was remitted to bring up a further report, and as to the source from which the cost of the building was to be defrayed.

AN inquiry has been held in Manchester on the part of the Local Government Board, with reference to the application made by the Corporation for power to borrow 150,000*l.* for the purposes of the Technical Instruction Acts, 14,000*l.* for public baths and a public meeting-room in the township of Cheetham, and 20,000*l.* for new fire-stations in the newly-added portions of the city.

THE following arrangements for the session have been made by the Sanitary Institute:—Sessional meetings, for communications and discussions on sanitary subjects, Wednesdays, February 8, March 8 and April 12. Lectures and demonstrations for sanitary officers, specially adapted for candidates preparing for the Institute's examination for inspectors of nuisances. London:—Two courses each of seventeen lectures on Tuesdays and Fridays, at 8 P.M., the first commencing on January 31 and the second on October 3. Provincial courses of twelve lectures on Saturdays at King's Lynn, commencing January 7; Exeter, February 25; Dublin, March 18. Arrangements for other lectures are in progress.

THE committee of the Bridgnorth and South Shropshire Infirmary report that Mr. T. M. Southwell has offered to present about one acre of ground near the North Gate as a site for a new infirmary, and Mr. W. O. Foster, Apley Park, to contribute 1,000*l.* towards the building fund. The cost is estimated at 4,000*l.*

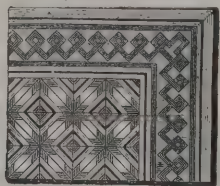
AT the meeting of the Clarkston School Board, held at Airdrie, it was reported that Captain J. Towers Clark had granted a free site at Moffat for the new infant school. Mr. George Arthur, architect, Airdrie, was instructed to prepare plans for a school to accommodate 150.

THE Sanitary Committee of the Leicester Town Council have recommended the acceptance of the tender of Mr. J. E. Johnson,

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5-16 inch thick, laid in Patent Composition on
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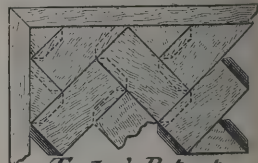
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MOSAIC

PAVING.

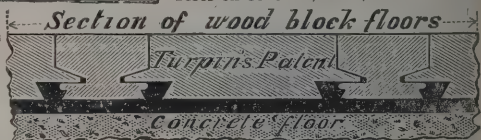
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for the extension of the infectious hospital accommodation, for 1,762l. The Council negatived the recommendation, and further decided not to proceed with the work on the grounds that it would not be of a permanent character, and that extra accommodation might possibly not be required.

The *Glasgow Herald* says:—"The electric lighting of the streets of the central area of the city has advanced a stage. In order to thoroughly test the capabilities of the new installation, the arc lights have been kept burning along with the ordinary gas lamps since the inauguration on Saturday. Yesterday evening the electric lamps only were switched on, and the general public had an opportunity of seeing the streets under the rays of the new illuminant without the aid of any other light." The results were satisfactory.

NOTES ON NOVELTIES.

The "Safety" Pedestal Washdown Closet, Registered.—

This closet, which has been designed to obviate the multifarious disadvantages and imperfections found in most types of waterclosets now in the market, is highly commended as a certain safeguard against sewer gases. It is considered by



some of the leading architects, plumbers, sanitary inspectors and others, from whom we have received flattering encomiums, to be the safest and most reliable closet at present before the trade. The force of the flush is exerted directly on to the water in the

trap, insuring a thorough clearing of the contents through the trap, and a complete cleansing of every part of the basin. There is always a large surface of water in the basin and a deep-water seal in the trap. All parts being fully exposed and free of access, any defect could readily be detected and remedied. It is constructed with a highly glazed earthenware basin and strong lead trap secured to a lead pedestal pier, or support, provided with holes for securing to the floor. The separate parts are not united by screws, so that fracture by contraction or expansion is avoided. The basin is bedded into the trap with white lead, or other suitable material, in the usual way. The trap can be fixed at any angle to suit the junction or soil-pipe to which it is soldered, as shown in the engraving. The connection between the basin and trap being above the water-line makes it physically impossible for an escape of sewer gas to take place. Should the basin be broken at any time, it could be replaced for a trifling outlay, whereas the replacement of ordinary closets is a matter, in many instances, of several pounds. It is simple in construction, cheap, effective, durable, cleanly, easily fixed, and cannot get out of order. Architects may specify it with confidence, as it is sure to give the utmost satisfaction wherever fixed. Messrs. Wright Sutcliffe & Son, of Halifax, are the manufacturers.

THE BUILDING EXHIBITION.

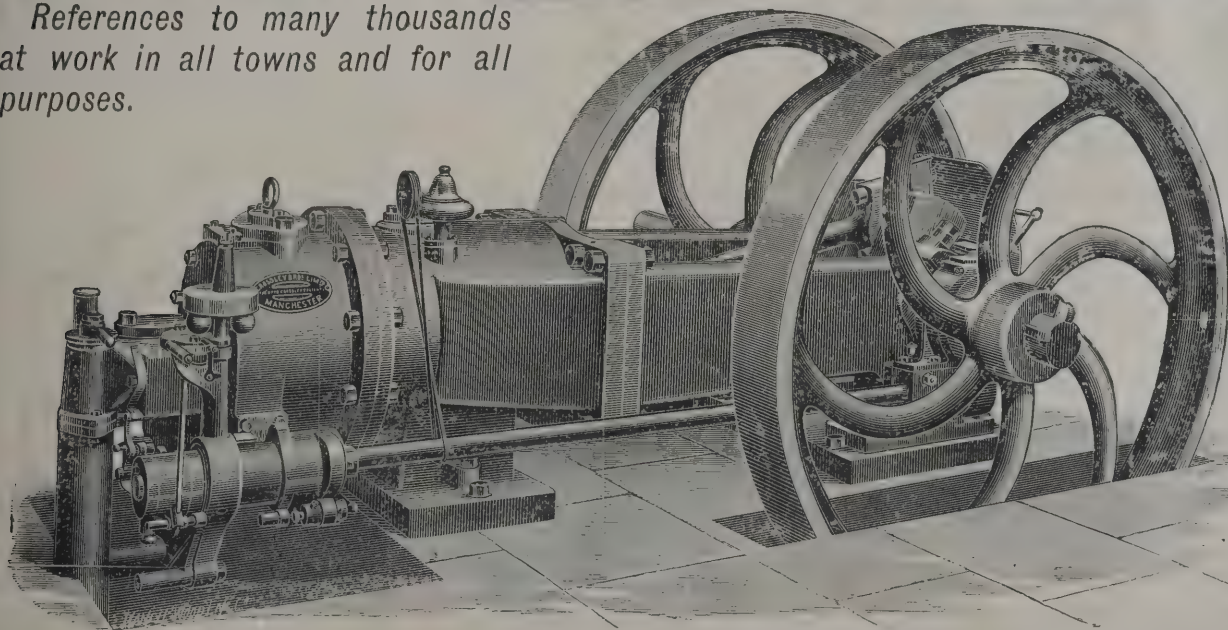
IN our next issue detailed descriptions of various exhibits shown at the Building Exhibition opened this week at the Royal Agricultural Hall, Islington, and among them of the exhibits made by the St. Pancras Ironwork Company, Messrs. Barnard, Bishop & Barnards, Mr. Robert Adams, Mr. T. Freeman, Messrs. Ellis, Partridge & Co., Mr. Hindley, of Bourton, the Blackman Ventilating Company, &c., will appear.

Francis E. Clotten.

"Xylolith," or stone-wood, is shown by Mr. Francis E. Clotten, of 258 High Holborn. The special advantages claimed for it are that it is absolutely water, sound, dry-rot, vermin, white-ant and fire-proof; that it combines all the best qualities of the hardest stone and toughest wood; that it effectually resists all wear and is unbreakable; that it neither shrinks, swells or cracks, is almost non-absorbent, unaffected by any influence of temperature, and admits of no fungoid growth; that it is specially adapted for most building purposes, flooring

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Every Engine thoroughly tested before being sent out. All parts made strictly to Gauge. Over 800 Engines always in hand.
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and roofing halls, passages, churches, schools, public offices, warehouses, cellars, shops, factories, railway stations and platforms, and not being porous is easily cleaned, and does not absorb or harbour impure or infectious matter. It is therefore strongly recommended for flooring and other use in dairies, hospitals, barracks, workhouses, prisons, laboratories, farm sheds and the like buildings. That it is much superior to corrugated iron for building purposes—entire private residences and official buildings, permanent or movable houses, sheds, offices, huts, &c., for use along railways, docks, &c., warehouses, stores, cricket, lawn-tennis and garden pavilions, racecourse stands, halls, chapels, exhibition buildings, bungalows and shooting-boxes, houses, &c., keeping perfectly cool in summer, and comfortably warm in winter, are unrivalled for extreme climates.

The patent automatic "peat dust" closets are shown, the peat dust having made its mark as a sanitary and deodorising agent. The closets are shown in different varieties to suit many requirements.

QUEENSLAND TARIFF.

THE following are the Customs duties upon goods, &c., used in the building and engineering industries:—

Fixed Duties.

Cement, 2s. per barrel. Iron castings, 3s. per cwt.; iron, pipes, cast, 2s. per cwt.; corrugated iron, 2s. per cwt.; galvanised iron, 2s. per cwt.; iron wire, 2s. per cwt. Lead, piping and sheet, 2s. per cwt.; white and red lead, 3s. per cwt. Oils, mineral, 6d. per gallon. Paints, wet and dry, 3s. per cwt. Tanks (iron), 8s. each. Turpentine 6d. per gallon. Timber logs, 1s. 6d. per 100 sup. feet; timber (undressed), of a scantling under 96 square inches, 1s. 6d. per 100 sup. feet; timber (dressed and sawn), of a scantling under 96 square inches, 3s. per 100 sup. feet.

Ad Valorem Duties.

For every 100l. of the value thereof a duty of 5l.:—Ash timber (in plank); carriage shafts, spokes, felloes, naves, hubs, bent wheel rims; furniture springs. For every 100l. of the value thereof a duty of 15l.:—Agricultural machinery. Artists' colours. Asphalte, asbestos (unmanufactured). Carriage-makers' materials, castors for furniture. Casks and staves and heads imported in shooks. Cutlery, gilt moulding, gold and silver leaf. Ironmongery and hardware, viz.:—Bolts and nuts

over $\frac{3}{4}$ of an inch diameter; door-knobs—glass, brass, china; emery cloth, emery paper, emery powder; hammers; hinges; holystones; irons—batters', Italian, smoothing, and tailors'; latches; locks; mortice furniture, all kinds; patent door-springs; pencils (carpenters'); sash-fasteners; staples for fencing; tinfoil; tinned rivets; weighing machines of all kinds and weights for same. Marble and stone unwrought. Paper-hangings. Tar (Stockholm).

Articles exempted from duty.

Bolts and nuts and bolt-heads, and nuts $\frac{3}{4}$ -inch diameter and under, in lieu of bolts and nuts exempted by third schedule of the Custom Duties Act of 1888. Boiler-plates, boiler tubes. Brass—bar, sheet and rolled. Buckles of every description. Carriage and cart-makers' materials, namely:—Spring steel, brass hinges, tacks, tyre-bolts, shackle-holders, rubber cloth and American cloth. Copper—sheath, plain, ingots. Copper—rod, wire. Copper nails. Copper wire, thread-covered. Dynamite, gelatine dynamite, lithofracteur, blasting-powder, fuse, detonators and other explosives, except gunpowder. Eyelet punches and eyelets. Fire-engines. Glaziers' tools. Grindstones. Iron ore, iron, plain sheet (not including galvanised). Iron, pig. Iron, bar. Iron, rod, from $\frac{3}{16}$ ths to $\frac{1}{2}$ inch; channel iron, angle and tee iron, rolled iron joists up to 10 inches by 5 inches. Iron, scrap. Iron, hoop. Malleable iron and copper piping. Metal fittings for portmanteaus, travelling bags and leggings. Metal frames for bags and satchels. Muntz metal. Machinery of the following description, not including engines and boilers:—Flour-milling, lathes over 3½ tons weight, drilling machines over 7 tons weight, shearing machines over 7 tons weight, plate-bending machines over 2½ tons weight, punching machines over 5 tons weight, slotting machines over 4 tons weight, shaping machines over 2½ tons weight, book-binding and ruling machines, Yaryan evaporators, canning machines, steam-threshing machinery. Mill stones. Metal tubing, except tin, zinc welded, and lead. Ores. Machinery for carding, spinning, weaving and finishing the manufacture of fibrous material, and cards for such machinery. Machinery—dry air, for refrigerating, without engine. Machinery used in the manufacture of paper and felting. Gas engines. Portable engines. Centrifugals—multiple effects. Traction engines and steam ploughs. Sewing machines. Tubing for artesian wells. Freezing machines, not including engine power. Machines, namely—planing machines, and machines for joinery, hot-air machinery for drying timber, hydraulic hat-moulds, knitting



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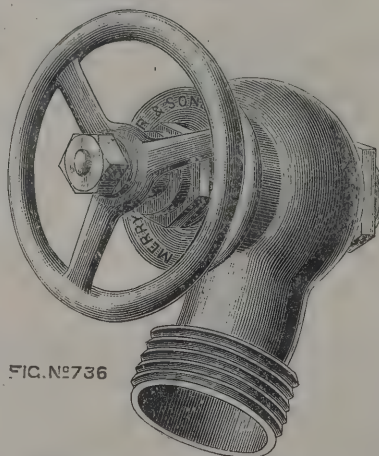
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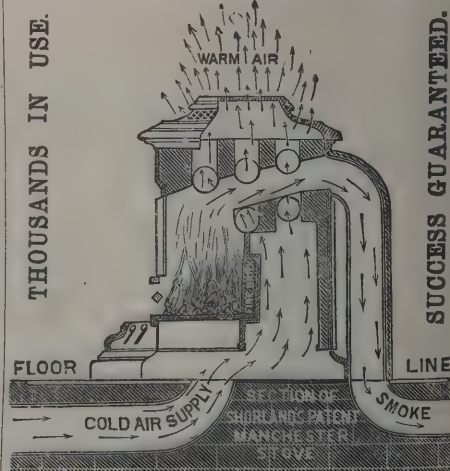
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machines, printing machines and presses, but not the motive power (if any) for same. Machinery for telegraphic purposes. Pig lead, plaited nails. Steel rails, steel unwrought; sheet, bar, angle and tee; steel wire rope. Tin plates; tools. Wire netting. Zinc.

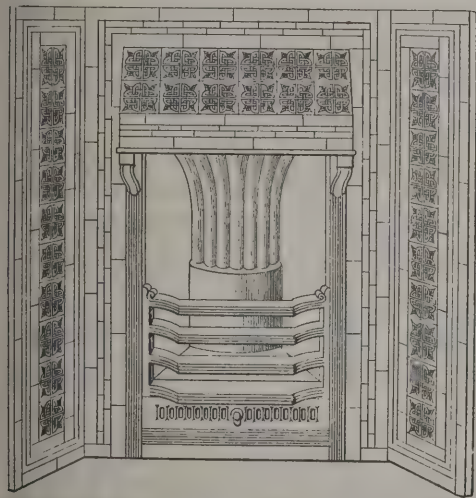
BUILDING REGULATIONS IN NEW YORK.

A BILL has been introduced in the New York Senate by Senator Amasa J. Parker, to provide for the construction, regulation and inspection of buildings in the several cities of the state, except in the cities of New York and Brooklyn. According to *Architecture and Building*, the whole Bill is virtually the New York Building Law toned down to reasonable requirements to compel cities that had no—or no adequate—regulations to protect the life and property of the general public. Particular care seems to have been taken to avoid any possible unfairness by the building authorities, and provision is made that where a permit has been refused to an owner who claims that the provisions of this Act do not directly apply, or that an equally good and more desirable form of construction can be employed in any specific case than that required by this Act, then the owner or his representative shall have the right to present a petition to the superintendent of buildings, together with a deposit of 30 dollars, requesting the appointment of an examining board, and thereupon the superintendent of buildings shall appoint a disinterested and competent architect or builder, the applicant shall appoint a second, and the two so chosen shall select a third. The examiners shall consider such petition, and, as soon as practicable, render a decision thereon. The board of examiners are authorised and empowered to grant or reject such petition, and the decision of a majority of them is to be final. The Bill provides that superintendents of buildings and deputy superintendents of buildings shall be competent architects or builders of at least ten years' practice. The inspectors shall be competent men, either architects, civil engineers, masons, carpenters, or ironworkers, who have served at least ten years as such. In cases where buildings are declared to be unsafe, and owners do not secure or remove them, they are to be notified that a survey is to be held by three competent persons, each of whom shall be a practical builder or architect, and one of whom shall be the superintendent of buildings or one of his assistants, another of whom

shall be appointed by the owner, and the third by the two thus chosen. If the person or persons on whom said notice is served refuse or neglect to appoint a surveyor, within a time fixed in the notice, the superintendent of buildings shall appoint a builder or architect to act for the person or persons so served with notice, and said two persons may make the survey; and in case of disagreement they shall appoint a third person, a builder or architect, to take part in the survey. If the person acting on behalf of any department or bureau of buildings, and the surveyor appointed by the person or persons on whom any such notice was served, shall neglect or refuse to choose a third person to act upon any survey, within a reasonable time, the superintendent of buildings shall designate such third person. The survey fee is limited to ten dollars each to the two chosen outside the member of the building bureau.

ECONOMIES OF ELECTRIC LIGHTING.

A MEETING of the Architectural Section of the Philosophical Society of Glasgow was held recently, when Mr. T. Crichton Fulton, electrical engineer, read a paper on "The Economies of Electric Lighting and Power Transmission." Mr. Campbell Douglas occupied the chair. Mr. Fulton at the outset drew attention to three aspects of the question which he wished to present, though he would make no attempt rigidly so to divide his treatment of the subject:—(1) The economy which results from the use of electricity; (2) economy in the choice and erection of the necessary plant; and (3) economy in the use of the plant itself. Proceeding to treat of the manner in which electricity is generated in large quantities in modern days, he briefly showed how this was effected, and pointed out that the two essentials were a dynamo and some mechanical means of rotating its armature. The means adopted varied with varying conditions. If water-power was handy, it was by far the most economical, especially if there was facility for storage and an ample supply. Where coal was very cheap steam-engines and boilers might be found more suitable, though their efficiency of conversion was certainly very low indeed. Where neither of these prime movers was convenient, gas-engines, which had been enormously improved of late years as regards efficiency, steadiness, and freedom from noise, and which were both cleanly and handy to work, would be found of great service. There were many mills, factories, &c., which



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OPINIONS OF THE PRESS.

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had a considerably greater power—either engine-power or boiler-power or both—than was needed to drive their machinery, and certainly it would be a direct economy to use this surplus power for lighting the premises. In speaking of the distribution of the current, the lecturer condemned as a very "penny-wise-and-pound-foolish" policy the use of two small conductors, or of conductors which were not well insulated. Too small conductors caused too great frictional resistance; this again caused heating of the conductor, which was not merely a source of waste, but a positive menace to life and property. He then described shortly the construction and action of incandescent lamps, and pointed out how much superior they were to our present modes of lighting as regards health, cleanliness, safety and steadiness. The arc light was next touched upon, and was shown to be both suitable and economical for large buildings and open spaces, such as harbours, stations and public streets. This light was not merely the safest, but by far the most economical to use for such places as chemical works, match factories, timber yards, paper mills (where the processes have to be carried on night and day), hospitals and dwelling-houses. In speaking of the transmission of energy by means of electricity, Mr. Fulton instanced the cases of a mine in New Zealand, where the generating plant was placed near the coast, and the current transmitted five miles to the mines, which were situated some 2,000 feet above the sea-level; and of the recent experiments in Germany, when 72 per cent. of the water-power derived from the falls of Lauffen was transmitted over 100 miles to the Frankfort Exhibition, there to be retransformed into mechanical energy by means of electro-motors. Small electro-motors were quite as efficient as large ones—which steam-engines were not—and the time might not be far distant when, in some industries at least, the present plan of centralising the whole operations in one huge factory might be changed for one in which workmen carried out many of the processes by the aid of electricity at their own fireside. The lecturer next gave his audience some idea as to the cost of erecting and working installations, though this could not be done with any accuracy owing to the great variety of conditions. It was necessary, however, to have the work properly planned and arranged, and thoroughly superintended and tested, in order to avoid as much as possible the risk of failure, annoyance and frequent outlays for alterations and repairs very soon after the work had been completed. This could only be done adequately by having skilled advice from an independent source.

FALL OF CHIMNIES.

IN St. Helen's much excitement has been caused by the fall of the highest chimney in the town, viz. one in the Greenbank Alkali Works, belonging to the Alkali Union. The chimney was 300 feet in height, and the diameter at the base was 26 feet. During one of the gales last week, and without any warning, the chimney came down with a crash, the whole volume of the bricks falling around the base of the structure. The material in its fall crashed on the woodwork adjoining among the vitriol tanks, and a large quantity of liquid was lost. The hydrochloric acid condensers were also partially destroyed, the chloride of manganese tank and a great deal of the machinery connected with the bleaching plant damaged. The ropery belonging to Messrs. W. J. Glover & Co. was also damaged by the falling *débris*. The business at the Alkali Works is of course suspended, and about two hundred men are left without employment.

About the same time there was a similar occurrence at Widnes, which caused, moreover, the death of two workmen. A chimney-stack, 90 feet high, in the works of the United Alkali Company, which had suffered considerably by the recent storms, was being repaired by Messrs. J. Whitehead & Co., Liverpool. The defective portion consisted of only about 6 feet of coping and brickwork at the top of the stack, and as the mortar had been eaten away by the chemical gases emitted from the chimney, it was found necessary by Mr. Whitehead to displace an iron band encircling the chimney at the top and remove the bricks and coping-stone one by one. A substantial pole scaffold having been erected, the work of demolishing the defective portion was proceeded with. On Saturday afternoon, without any warning, a portion of the brickwork, probably about half a ton, fell upon the scaffold, tearing a portion of it away, and two of the men who were working upon it were thrown to the ground, 85 feet below. One, who fell upon his head, was picked up dead, while his companion fell upon his right shoulder and received serious injuries which terminated fatally shortly after his admittance into the Accident Hospital. None of the other workmen were injured, but several had narrow escapes from the falling *débris*. The men were fully competent to discharge the work which brought such a sudden and fatal termination to their lives. The firm of Messrs. Whitehead & Co. have repaired a number of chimney-stacks in

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PROOF IMPRESSIONS of the BEAUTIFUL ART PLATES which appeared in the New Year's Double Number of "THE ARCHITECT," and in the Number for January 10, 1890, THE TOILERS OF THE DEEP. Two Tinted Ink Photographs (size 18½ in. by 13½ in.), may now be obtained, price 1s. each. Free by post, carefully packed in patent roller, 2s. 3d.

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Widnes, and this is the first accident they have had which has been attended with fatal consequences.

At the inquest on the two men who were killed the evidence was to the effect that the company, believing the top portion of the chimney connected with the salt-cake department of the works had become defective, put the repairs in the hands of Messrs. J. Whitehead & Co., steeplejacks, Liverpool. It was then found that the acids from the gases of the salt-cake manufacturing process had eaten away the brickwork and mortar of 12 feet of the top of the chimney, which was about 35 yards high. Six men, under a sub-contractor named Lonsdale, removed the heavy iron hoop from the top, and Boden and Mains were left on the scaffolding (an ordinary pole one used in similar work) to remove the bricks one by one. A portion of the brickwork gave way and broke one of the poles and planks, but these were replaced with new ones, and according to all the witnesses who were called, the scaffolding was made as safe as when first erected. Two of the men, however, had only just reached the ground when they heard a crash, and on looking up saw the stage of the scaffolding on which Boden and Mains were working, together with a quantity of brickwork, falling to the ground. Boden was picked up dead, and Mains only survived a couple of hours. The witnesses admitted that the brickwork was not taken down "course by course" and a level surface left, which is usually done, because there was a breach in the chimney which necessitated one side of it being left about a yard and a half higher than the other. The jury after viewing the scene of the accident returned a verdict of accidental death, and attached no blame to anyone.

LONDON SANITARY PROTECTION ASSOCIATION.

THE twelfth annual meeting of this Association has been held at the house of the Society of Arts, Dr. J. S. Bristowe in the chair. The report of the Council for the year 1892 showed a further increase of membership, 506 having joined during the year. Five hundred and thirty-five houses had been inspected for the first time, of which 68 per cent. were reported as in a more or less bad condition, a rather larger proportion than the average of the previous eleven years, showing that the necessity for the Society's existence is as great now as when it was founded. Amongst the buildings inspected were sixteen hospitals, schools or other public institutions. The Council

regretted that no application had been received for the inspection of any working-class dwellings, but they had given an additional donation of 10*l.* to the Mansion House Council on the Dwellings of the Poor. Application had been made for a share of the Berridge legacy, and if this proved to be successful, the Council hoped to be able to at once take steps for rendering the results of their twelve years' experience available for promoting the general advance of sanitation by means of lectures, publications, &c.

The Chairman, in moving the adoption of the report, referred to the excellent work done by the engineers, which must have had indirectly an influence for good far beyond the membership of the Association.

Lord Chelmsford seconded the motion, which was carried unanimously, and the Council and officers were re-elected, the Duke of Argyll being president.

HOUSE MOVING.

THE *Scientific American* says:—The ferry-house located at the Brooklyn terminus of the Thirty-ninth Street ferry, between the Battery in New York and South Brooklyn, is a brick structure 52 by 110 feet. This building was located at the foot of Thirty-ninth Street. The Brooklyn City Railroad Company required increased facilities in that part of the city, and in consequence of this the ferry-house was removed from its original site 140 feet westward and 25 northward, and when the job is completed the building will stand 17 inches lower than it stood on the old site. This work was done in about one month, without injury to the walls, and at much less expense than would have been involved in tearing down and rebuilding.

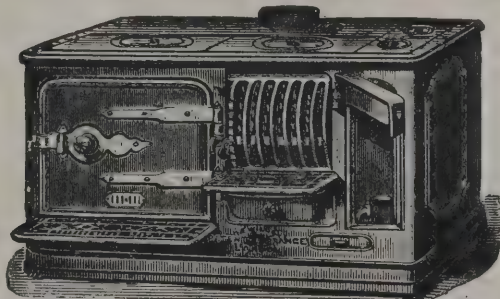
The building was placed on a rigid framework and its walls were shored and braced by tie rods and cross timbers, and it was moved on ways consisting of a framework of heavy timbers provided with diagonal guides which caused the building to move sidewise as well as endwise, the frame upon which the building rested being provided with shoes sliding upon diagonal guides. The abutments against which the moving screws rested were heavy timbers secured to the ways by means of chains. After the screws which abut upon the timbers had been run out their full length, they were returned to their original positions and the timbers moved forward and again made fast, when the operation was repeated.

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THE COVENTRY BATHS.

At the meeting of the Coventry City Council the Baths Committee presented a report with the following list of tenders for the engineer's work in connection with the hot and cold water supplies and heating apparatus of the new baths:—

C. H. Ewen, London	£2,387	0	0
J. C. & J. S. Ellis, Sheffield	2,375	0	0
Russell & Co., London	1,795	0	0
Thomas & Taylor, Stockport	1,794	0	0
Fraser & Son, London	1,792	0	0
T. Parkes, Birmingham	1,746	4	6
J. Braithwaite & Son, Kendal	1,735	0	0
Berry & Sons, London	1,689	0	0
Griffin Foundry Co., Birmingham	1,675	0	0
J. & F. May, London	1,625	0	0
Bradford & Co., Manchester	1,616	0	0
W. Summerscales & Sons, Keighley	1,600	0	0
Harper Twelvvetres, London	1,525	0	0
Murdoch & Cameron, Glasgow	1,524	14	0
Coventry Gasfittings Co., Limited	1,390	0	0

The balance of the provision for this work, after allowing for the boilers, which were ordered independently, is 1,970*l*. The committee recommended that the tender of the Coventry Gasfittings Co., Limited, be accepted.

It may be of interest to reprint the estimates for this work which were published in the *Architect* last October as below:—

Benham & Co.	£3,475	0	0
Russell & Co.	2,875	0	0
Jeffries	2,850	0	0
Pulsometer Company	2,400	0	0
RAINBOW ENGINEERING COMPANY (accepted)	2,300	0	0
Murdoch & Cameron	2,237	0	0
Bradford & Co.	2,090	0	0
Summerscales	1,650	0	0

Some explanation of what appears so unintelligible a proceeding cannot fail to be also of interest.

WROUGHT-IRON.

IN a lecture on this subject, given in the Mason College, Birmingham, the lecturer on metallurgy, Mr. T. Turner, after describing sundry details of furnace construction and the difficulties that are met with in endeavouring to determine the best form of furnace, described in detail the nature of the changes that take place during the purification of cast-iron in puddling. It was first mentioned by Price and Nicholson, in a patent granted in 1856, that when cast-iron was subjected to oxidising influences the silicon was almost entirely removed before the other impurities were to any considerable extent affected. Shortly afterwards, in 1858, Calvert and Johnson, in their well-known researches, determined some of the most important facts with regard to the removal of several of the other impurities. But though the sequence of the changes was thus made out the theoretical reasons underlying the changes was open to discussion for many years, and in some particulars is even yet unsettled. Arguing from analogy with what takes place in steel-making, it was suggested that the purest iron would give the largest yield and the best product, and that the changes were the result of the action of ferric oxide on the carbon and other impurities that were removed. The late Sir W. Siemens, in 1868, was the first to point out that the most active agent in the puddling furnace was the fluid magnetic oxide, which, owing to its fluid condition, can readily act on the molten iron and bring about the required changes. Too much ferric oxide leads to a thick slag, which is less active in its character, which is not so good to work and which leads to waste of metal by atmospheric action. But when the slag is of proper composition it both purifies the iron and "nourishes" it as well; that is, the slag supplies oxygen to remove the impurities, while in so doing the oxide is itself converted into metallic iron and added to the charge. It is therefore a mistake to regard the fluid slag as useless or harmful, and sufficient hammer slag or other cheap fusible fettling should be charged early in the process, so as to give what is required. A pig-iron with too much silicon or phosphorus gives bad results owing to excessive requirement of fettling, or what the puddler aptly calls its "hungry" character; but on the other hand, if the metal used is too pure, not only is the yield less, but the product is often red, short and inferior. An iron of intermediate quality is thus most suited for the use of the puddler, and in this fact lies one of the most important reasons which has led to the continuance of puddling in the face of

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such formidable rivals. By means of a series of lantern-slides, prepared from photographs of the interior of the furnace during the progress of a charge, the nature of the changes that take place was rendered clear, and the audience was thus able to follow each step of the process from the preparation of the furnace after a previous charge to the rolling of the finished bloom of iron into a puddled bar.

LEICESTER MAIN DRAINAGE.

At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening, March 6, 1893, Mr. William Andrew McIntosh Valon, J.P., president, in the chair, a paper on "The Leicester Main Drainage, &c., and the Construction and Testing of the Sewage Pumping Engines and Boilers," was read by Mr. E. G. Mawbey, borough engineer.

The author having referred to the great prosperity which Leicester had enjoyed for many years past and the rapid increase of population, said that in the year 1891 an Act of Parliament was obtained for the extension of the borough boundaries, for which scheme he was the engineer. The population was now 180,000, and the area $8,534\frac{1}{2}$ acres, the rateable value being about 650,000*l*.

Both the gas and water undertakings belong to the Corporation, and Mr. Alfred Colson, M.Inst.C.E., is engineer and manager of the gas department, and Mr. Frederick Griffith, M.Inst.C.E., engineer and manager of the water department.

The Corporation has recently finished floods prevention works which have cost 352,000*l*. The drainage area (above Leicester) of the river which had been improved is 147 square miles. The new flood channel will carry off 400,000 cubic feet of water per minute, or $1\frac{3}{4}$ inches of rainfall in twenty-four hours. The length of the principal weir constructed was 500 feet. These works were for the most part designed and carried out by the late Mr. Joseph Gordon, M.Inst.C.E., and Mr. F. Griffith, M.Inst.C.E., but were completed and the new West Bridge designed by the author.

The flooding of the town, which in times past had been disastrous, was now entirely prevented within the boundaries of the old borough. The author stated that storm outfall works designed by himself were now being carried out, and that the contracts let amount to 71,447*l*. The main culvert is eight feet in diameter, and about three and three-quarter miles long, and would carry off about 70,000,000 gallons of water in twenty-four hours from the built-upon area of the extended borough.

The author said that about ten miles of new main intercepting brick sewers and storm outlets were being constructed in the borough which were designed by the late Mr. Gordon, and would, when completed, have cost about 105,000*l*. The sizes of the two main trunk sewers are 7 feet 3 inches by 6 feet 3 inches, and 5 feet 3 inches by 3 feet 6 inches respectively. Nearly one-third of these works were executed under Mr. Gordon's personal direction, and that the carrying out of the remainder, together with the preparation of the working drawings for rather more than half of these works, have devolved upon the author as the chief engineer. A further loan of 13,400*l*. has recently been sanctioned for additional sewerage works in the added areas according to the plans of the author. The sewage is treated on the system of broad irrigation. The total area of the farm is 1,700 acres, about 1,400 of which will be available for sewage, and are now being laid out and managed under the author's advice and direction. The total expenditure at present (exclusive of land) sanctioned was 58,900*l*.

The author gave a detailed description of the four independent rotative compound condensing beam engines, and the eight double-flued Lancashire steel boilers, each 30 feet by 7 feet, working at 80 lbs. pressure per square inch, for pumping sewage from the Leicester sewers to the Beaumont Leys Sewage Farm through two 33-inch cast-iron rising mains for a distance of about one and a half miles, and to a net height of 163.66 feet, which, together with the engine and boiler-houses, workshops and manager's house, cost 54,970*l*.

The following are some of the dimensions given:—

		Feet.	Inches.
Diameter of high-pressure cylinder	...	0	30
Stroke	...	5	$9\frac{1}{4}$
Diameter of low-pressure cylinder	...	0	48
Stroke	...	8	6

The author stated that to each engine there are two main sewage pumps of the piston and plunger type, one at each end of the beam, with a stroke of 5 feet $9\frac{1}{4}$ inches, the diameter of the piston being $27\frac{1}{4}$ inches. The suction of these pumps are single-acting and the deliveries double-acting, with flap-valves and very large waterways. The cast-iron fly-wheels weigh 21 tons each and the beams 15 tons each, formed of double steel flitches 2 inches thick and 6 feet deep at the centre. There were two steel air vessels, each 25 feet 9 inches high by 5 feet in diameter. The author then gave full particulars of the methods adopted in the official trials of these engines and boilers, which were drawn up and conducted by himself, and he

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also gave in much detail the results of these trials, compared with the requirements of the specification, the averages of these results in a few of the principal items being as follows :—

	Lbs.
Consumption of coal per actual horse-power per hour in water lifted	1'915
Ditto per indicated horse-power per hour	1'712
Indicated horse-power per engine working at 12'051 revolutions per minute	199'63
Actual horse-power per engine in water lifted working at 12'051 revolutions per minute	178'47
Ditto in percentage of indicated horse-power	89'41
Duty in weight of water lifted per 112 lbs. of coal	115,913,333

Nixon's navigation Welsh coal was used.

The author explained that as these engines can be worked safely at about fifteen revolutions per minute, each of them is capable of developing well over 220 actual horse-power in water lifted. He stated that the engines and boilers were designed by the late Mr. Joseph Gordon, M.I.C.E., assisted by Mr. T. E. Laing, Assoc. M.I.C.E., and Messrs. Gimson & Co., of Leicester, were the makers, the manufacture and erection being done under the author's personal supervision as successor to Mr. Gordon when that gentleman was appointed chief engineer to the London County Council; that Mr. Stockdale Harrison, F.R.I.B.A., of Leicester, designed the buildings.

The total cost of carrying out the schemes he had mentioned would be nearly two-thirds of a million sterling.

The paper was well illustrated, and contained tables in considerable detail of the results of the trials.

ELECTRICITY IN FACTORIES.

ON Saturday Mr. Alexander Siemens, of the firm of Messrs. Siemens Bros. & Co., Woolwich, delivered a lecture on "Electricity as a Motor-power for Factories" before a large audience of the Birmingham Association of Mechanical Engineers. The simplicity of the construction of electrical machines, he said, was very marked, and that was the first point he brought before the notice of his audience. Then, again, little attention was required to look after such appliances as compared with machinery for other motive-powers. Allusion was made to two locomotives which had been constructed by Messrs. Siemens, and after they had each run 20,000 miles one

was inspected by Lord Kelvin, and the result was highly satisfactory. The first set of brushes were still in use, and to have a motor to run 20,000 miles, and, say, using only one pair of brushes per year, could not be considered serious. Sir William Siemens had proved the advantage of saving both expense and trouble by using an electric motor in his garden for pumping water in place of driving a steam-engine. Electric motors, besides being quite compact, were very light in weight, considering the power they exerted. There was no necessity for providing heavy foundations, as required when other powers were provided. The ideal way of applying any electric motor was that every machine-tool should get its electric motor, and so dispense with strong columns for buildings, and to avoid the use of shafting, counter-shafting, banding and pulleys, all these being a consideration on the capital outlay. He then referred to the alterations which had taken place at their works at Woolwich, where electricity has superseded steam at a saving of a considerable amount of space, of 800/. a year in wages, in addition to a large quantity of coal, which they must admit was a great consideration in maintenance. There were precautions necessary in using any electrical machine, and these he pointed out. In the transmission of power there was a saving by the adoption of electricity, as shown by a gentleman who read a paper before the Belgian Society of Engineers on the construction of the Small Arms Factory at Liège, which was a new place to be constructed. That gentleman went very carefully into the calculation as to what would be the best way of obtaining power, whether to have one or two steam engines, and then as to how to transmit the power, whether by shafting and belting, by ropes or electricity. The results were that with electricity he was sure he could count on 70 per cent. of the indicated horse-power being rendered at the machines, and with the shafting he could not possibly get more than about 60 or 63 per cent. Therefore in that respect the electricity was decidedly superior to the other method of transmission. By the establishment of central stations, small works could obtain electric power; they would then be able to have the facility of being placed much more on the footing of large works, as far as their source of power was concerned, but as to how that system would develop it was very difficult to foretell. It was quite certain that electrical motors for industrial purposes generally would make a lasting impression, and that they were of the greatest possible importance for the future development of their industries. A discussion followed the reading of the paper.

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DUNDEE AND DISTRICT MASTER BUILDERS' ASSOCIATION.

THE annual dinner of the above Association was held in the Queen's Hotel, Dundee. After dinner the loyal and patriotic toasts were duly honoured. Mr. Stewart, Glasgow, submitted "The Lord Provost, Magistrates and City Council of Dundee." He remarked that Dundee had always been noted for the perseverance of its inhabitants, and he thought the city during the past fifty years had been very happy in the choice of its public men. Ground had risen from 300 to 500 per cent. in value, so that now it was very difficult to get a little patch of ground to carry on a modest business. Concluding, Mr. Stewart alluded to the beautiful situation of Dundee, and said it was frequently envied by Glasgow. Ex-Bailie Stuart, with whose name the toast was associated, replied. He remarked that Dundee had made both the worst and the best of its situation, and in all cases the wishes of the builders had to be given effect to. When they talked about builders they included architects and painters, and no doubt there was many a bad job covered by paint. Dundee builders knew a good deal about sanitary science in name, although he was afraid they did not know it very well by sight, but when they did life would be worth living. Regarding Lord Provost Mathewson, he felt that when he had laid aside the reins of office he would have left as great a fund of respect behind him as any man who had held the office before him, while the magistrates and council did the best they could, and if there were any axes to grind he had not counted them, but he did not think there were many. Convener Paul afterwards proposed the toast of the evening, "The Building Trades." He said that in all they did the Dundee builders were determined to give first-class work, work that would stand the test for a long time. They had only to look at the beautiful streets of the city as evidences of this, the buildings in many instances being superior to those in Glasgow. For some time past the building trade had been very dull, but he hoped the community would have the builders kept busy in the near future. Many people had adopted the foolish idea of investing their money abroad, with the result that they had the misfortune to leave it there, but he thought the tendency in the future would be for these parties to invest their money in stone and lime, and in

that event there would be no chance of their money running away. It would always be the aim of the firm he represented to forward the interest of the builders and to spread the contracts amongst them as equally as possible. He hoped the building trades of the city would have a successful future before them, and he was sure it had been a good thing for the masters to have been formed into such an influential Association as that which brought them together that evening—an Association that had been instituted not only in the interests of the masters, but also in the interests of the employes. He was sure the employes' Association recognised the great advantage derived from the masters' Association. The relations between the two Associations had always been most cordial, and as time went on he had no doubt they would continue to grow in strength and prosperity. The Chairman said the building trade was a most important branch of the local industries having regard to the number of workmen employed. When one looked at the changes effected in the city during the past few years in the matter of streets, buildings, &c., he must admit that the builders had had a fair share of the process of improvements, and much credit was due to the contractors for these improvements. For several years back the building trades had had a good share of prosperity, although at the moment things did not look so bright. At the same time they hoped that as the season advanced contracts would be plentiful, and that they would all be kept busy. At present contract prices were as low as they could be, and left a very small margin of profit, and he did not think there was likely to be much improvement in that direction for some time to come. Proceeding, the Chairman said that the Joint Association of the masters and men had been a great success as a board of arbitration. It had obtained the loyal co-operation of the men, and they hoped that state of matters would long continue. On the eight hours' question, the Chairman said that while it was good in its intention it would have to be approached with great caution, and foreign competition would have to be taken into account. Mr. P. Sim and Mr. Mackison replied, remarking that the builders of Dundee had been characterised in their business relations with enthusiasm and enterprise. Mr. A. Duncan gave "Representatives from Other Cities," and Mr. Heron, Edinburgh, returned thanks; Mr. Alexander, "The Timber Trade," Mr. James Bell replying; Mr. W. Bennett, "The Quartermasters," Mr. James Morrison replying. The other toasts were "The Clergy," "The Ladies," "The Chairman" and "The Croupiers."

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REGISTRATION OF PLUMBERS.

THE Deputy Mayor of Cork presided at a public meeting held at the Cork School of Art, under the auspices of the Munster District Council for the National Registration of Plumbers. There was a large and representative attendance of plumbers, the medical profession, and the Corporation of Cork. Mr. W. Kaye Parry, M.A., B.E., honorary secretary to the Dublin District Council, delivered a lengthy and interesting lecture, entitled "The Seamy Side of Home, Sweet Home," in the course of which he laid great stress on the necessity for perfection in all matters connected with domestic sanitation. He said he desired to direct the particular attention of all householders to the two following points. (1) That children are particularly liable to succumb to the malign influence of sewer gas and impure drink and food; and (2) That while persons may become reconciled to their environment and can exist in dangerous houses to which they have become inured, those who have been accustomed to healthy houses are very liable to contract disease if they move into unhealthy houses. He had personally inspected more than 1,500 buildings, and hundreds of cases of sickness had been directly traced by himself to defects in drainage and plumbing and water pollution.

THE PLATE-GLASS INDUSTRY IN AUSTRIA.

THE United States consular officials in Vienna and Prague have sent reports to their Government on the plate and mirror-glass industries of Austria. It seems for two centuries the mirror-glass industry has been established in Bohemia, just across the Bavarian border, where the surrounding forests guaranteed a plentiful and cheap supply of fuel. At first glass for beads and bottles only was produced. In the latter half of the last century Bohemia held the first place amongst the glass-producing countries of the world; the value of the glass manufactured there in 1799 amounted to about a quarter of a million sterling. Early in this century, however, the markets began to be flooded with cheap English and French pressed crystal glass, with which Bohemian glass could not compete, and, notwithstanding the efforts of Bohemian glass manufacturers, the decline of the industry was inevitable. In recent years it has revived, and there are now in Bohemia about 150 glass works and nearly 3,000 grinding establishments, employing nearly 30,000 persons. There are a number of glass works in other Austrian provinces, and in Hungary there are over 70 in operation. The

chief factories for producing plate and mirror-glass are situated near Pilsen, in Bohemia. The value of these kinds of glass depends on the purity, and the greatest possible care is therefore taken to procure materials of the very best quality, and almost every manufacturer guards the formula of his own special mixture as a trade secret. The substances used, though the proportions differ, are quartz, purified potash, hydrate of lime or marble, saltpetre, arsenic, manganese and smalt. The reports enter into numerous details of the various processes of manufacture—blowing, rolling, grinding, smoothing and polishing.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

3680. John MacDonald, for "Improvements in domestic fire-grates."

3727. George White, for "Improvements in windows, window-sashes and window-frames."

3753. Alfred Julius Boulton, for "Improvements in safety-mechanism for hoists, lifts and the like."

3806. George Barker, for "Improvements in stoves and furnaces."

3807. Thomas Henry Ackroyd and Messrs. Willoughby & Co., for "Improvements in the method of and in apparatus for consuming smoke."

3820. John Marion Morgan, E. B. Neave, S. H. Wiley and W. Smithdeal, for "An improved filter."

3839. William Gunter, for "Improvements in cocks or taps, and in levers controlling the same."

3935. Robert Brown, for "Improvements in or pertaining to lock followers."

3938. Frank L. Voegtly, for "Improvements relating to fire-grates."

3914. James Allen, for "Improvements in plumb-levels and analogous instruments."

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As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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COMPETITION OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

ABERDARE.—March 25.—For Building Intermediate Schools. Mr. John H. Phillips, St. John's Chambers, Cardiff.

BARNESLEY.—March 20.—For Building Two Houses. Mr. J. H. Marshall, 101 Lancaster Street, Barnsley.

BATH.—March 17.—For Building Postal Sorting Office. Mr. H. W. Primrose, 12 Whitehall Place, S.W.

BOURNEMOUTH.—March 20.—For Constructing Sewers. Mr. F. W. Lacey, Borough Engineer, Bournemouth.

BRIGHTON.—March 21.—For Fitting-up Steam-cooking Apparatus at Workhouse. Mr. H. S. Reed, Guardians' Clerks' Office, Church Street, Brighton.

BURY.—March 21.—For Laying Cast-iron Pipes, Fixing Valves, Cocks, Hydrants, &c. Mr. J. Cartwright, Engineer, Corporation Offices, Bank Street, Bury.

CATFORD.—March 30.—For Building Twenty-three Houses. Messrs. F. & W. Stocker, 90 Queen Street, Cheapside, E.C.

CORNWOOD.—March 22.—For Building Passenger Station. Mr. G. K. Mills, Great Western Railway Company, Paddington Station, W.

DALTON-IN-FURNESS.—March 21.—For Building Manual Instruction School. Mr. William Butler, Clerk to the School Board, Dalton-in-Furness.

EDINBURGH.—March 18.—For Building Bruntsfield Public School. Mr. Robert Wilson, Architect, 3 Queen Street, Edinburgh.

FULHAM.—April 5.—For Building Diphtheria Wards at Western Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

GLASGOW.—March 18.—For Building Sanitary Washhouse, Ruchill Park. Mr. J. Lang, Clerk to the Police Commissioners, City Chambers, Glasgow.

GREAT WESTERN RAILWAY.—March 22.—For Constructing Passenger Station, Goods Shed, &c., Teignmouth. Widening Line, Constructing Milltown Viaduct and Earthwork, Fencing, Laying Ballast, &c., Cardiff. Mr. G. K. Mills, Paddington Station, W.

GUILDFORD.—March 20.—For Works to Town Hall in Connection with Approach from Police Buildings. Mr. Wm. Lower, Architect, 12A High Street, Guildford.

HAXEY.—March 18.—For Repairs to South Aisle of Church. The Vicar, Haxey.

HOUGHTON, HANTS.—March 20.—For Building School-Teacher's Residence, &c. Mr. John Hillary, Architect, Long-parish, Hants.

LEWISHAM.—March 21.—For Constructing Brick and Concrete Sewers, with Side Entrances, Ventilators, &c. Mr. Edw. Wright, Board of Works Offices, Catford, S.E.

LIMEHOUSE.—March 20.—For Works and Repairs to Sewers, Drains, &c., for Twelve Months. Mr. S. G. Ratcliff, Board of Works Offices, White Horse Street, Commercial Road, E.

MIDHURST.—March 18.—For Rebuilding House and Show-room. Mr. Wm. Buck, Architect, 60 West Street, Horsham.

NEWPORT.—March 21.—For Supply of Cast-iron Water Mains. Mr. Robey F. Eldridge, Town Clerk, Guildhall, Newport, Isle of Wight.

NEWTON-LE-WILLOWS.—March 20.—For Building Manager's House at Gasworks. Mr. R. Brierley, Town Hall, Newton-le-Willows.

PENYDARREN.—March 21.—For Building Forty-five Houses. Mr. J. Williams, Architect, Edward Street, Morgan Town, Merthyr Tydfil.

PETWORTH.—March 20.—For Alterations to Workhouse, Wisborough Green. Mr. H. Howard, Architect, Littlehampton.

PIRBRIGHT.—March 20.—For Walling, Goul Farm. Messrs. Peak & Lunn, Surveyors, 36 High Street, Guildford.

PWLLGWAWN.—March 31.—For Building Infants' School with Outbuildings, Boundary Walls, &c. Mr. J. J. Evans, C.E., Penarth.

ROCHESTER.—March 23.—For Excavating, Piling, Timbering and Concreting Foundation for Retort-house. Mr. Wm Syms, 58 High Street, Rochester.

SHEFFIELD.—March 18.—For Building Board School. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

TAVISTOCK.—March 21.—For Building Country House and Domestic Offices, &c. Mr. Samuel Knight, Architect, Temple Chambers, E.C.

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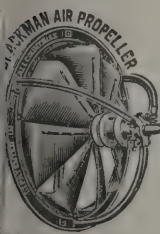
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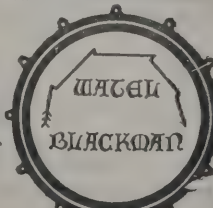
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THAKEHAM.—March 27.—For Additions to Workhouse. Messrs. Scott & Cawthorne, Architects, Brighton.

TONDU.—March 22.—For Construction of Tramway Bridge over Railway. Mr. G. K. Mills, Paddington Station, London.

TORQUAY.—March 20.—For Building Brewery at Ellacombe. Mr. Edward Richards, Architect, Manor Office, Park Crescent, Torquay.

WALSALL.—March 18.—For Supply and Erection of Apparatus at the Pleck Gasworks. Mr. John Tindall, Gas Engineer to the Corporation, Walsall.

WHAPLODE.—March 20.—For Building Chapel at Burial Ground. Mr. T. C. Willders, Clerk to the Whaplode Burial Board, Holbeach.

TENDERS.

BARRY.

For Building House, for Dr. Powell, Barry. Messrs. JAMES & MORGAN, Architects, Charles Street Chambers, Cardiff.

D. Davies	£2,139	0	0
D. J. Davies	2,120	0	0
Stephens, Bastow & Co., Limited	1,947	0	0
Richards & Cranston	1,794	8	2
D. & J. Homer	1,772	5	0
W. Richards	1,600	0	0
H. J. Money	1,580	0	0
F. Small	1,495	0	0

BARNET.

For Building Dwelling-house at Oakleigh Park, Barnet. Mr. W. D. CHURCH, Architect.

J. Chessum & Son	£1,920	0	0
J. Grover & Son	1,893	0	0
Lascelles	1,798	0	0
W. D. Dabbs	1,768	0	0
J. Cordell	1,735	0	0
W. Shurmur	1,728	0	0
Fairhead & Son	1,698	0	0
J. Withers	1,560	0	0
Tinson & Son	1,332	0	0

BEVERLEY.

For Building Boiler-house, Chimney-shaft, &c., at East Riding Asylum, Beverley. Messrs. HAWE & FOLEY, Architects. Quantities by the Architects.

G. Jackson & Son, Hull	£1,620	0	0
J. K. Foley, Beverley	1,510	0	0
G. & R. Pape, Beverley	1,498	0	0
Holden & Myle, Stalybridge	1,427	0	0

BISHAM.

For Erection of a House at Bisham, Berks, for Mr. Percival Harter. Messrs. KIDNER & BERRY, Architects, 23 Old Broad Street, London, E.C.

Silver & Son	£7,769	0	0
Lawrance & Sons	7,736	0	0
Y. J. Lovell	7,641	0	0
Webster & Cannon	7,383	0	0
W. Watson	7,376	0	0
Parnell & Son	7,144	0	0
S. G. SCOTT (accepted)	7,076	0	0

BRADFORD.

For the Erection of Six Houses, Laisteridge Lane and Sherborne Road. Mr. A. SHARP, Architect, Albany Buildings, Market Street, Bradford, Yorks. Quantities by Architect.

Accepted Tenders.

R. F. Dawson, Great Horton, mason and bricklayer.
W. Newell, Bradford, joiner.
Richard Hill, Manningham, plumber and glazier.
J. Thorp, Great Horton, plasterer and concrete.
A. Hill & Son, Manningham, slater.
J. Arundel, Manningham, painter.
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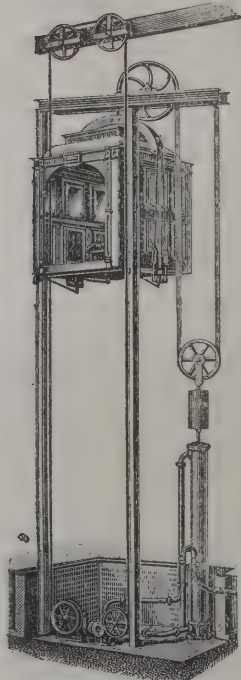
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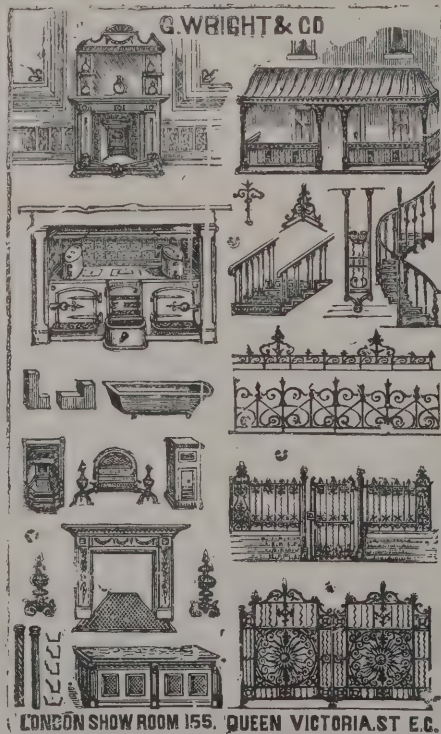
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Jenkins Bros., Swansea	1,750	780	2,530
Shipton & Sons, Cardiff	1,785	723	2,508
Stephens, Bastow & Co., Bristol	1,699	799	2,498
Claridge & Bloxham, Banbury	1,597	687	2,284
E. Rees, Pencoed (accepted)	1,375	520	1,895

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For the Erection of Retaining Walls at Recreation Grounds and Supply of Coping and Wrought-iron Railing, for the Corporation. Mr. F. S. BUTTON, C.E., Borough Surveyor, Town Hall, Burnley.

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Salterforth Stone and Brick Company, Burnley, 10s. 6d. per yard.

Burnley Wood Recreation Ground.

Smith Stanworth, Burnley, 9s. per yard.

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W. Walton, Burnley £385 8 10

CARDIFF.

For Erection of School Buildings, Romilly Road, Barry, for the Barry United District School Board. Messrs. SEWARD & THOMAS, Architects, Queen's Chambers, Cardiff. Quantities by Architects.

Jones Bros.	£3,130	0	0
Powell & Mansfield	3,111	0	0
Stephens, Bastow & Co.	2,999	0	0
D. C. Jones & Co.	2,887	0	0
Richards & Cranston	2,856	9	6
W. Richards	2,850	0	0
Money	2,760	0	0
W. Bowers	2,710	0	0
Small	2,640	0	0
GEORGE RUTTER, Barry (accepted)	2,577	0	0

CARDIFF—continued.

For Rebuilding No. 87 St. Mary Street, Cardiff, for Mr. James Howell. Quantities by Messrs. J. P. JONES, RICHARDS & BUDGEN, Architects.

Rees, Gibbon & Thomas, Cardiff	£2,807	16	9
Jones & Co., Gloucester	2,779	0	0
Jones Bros., Cardiff	2,650	0	0
D. J. Davies, Cardiff	2,550	0	0
C. C. Dunn, Cardiff	2,455	0	0
JAMES ALLAN, Cardiff (accepted)	2,356	3	6

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For Erection of the Grand Pump-room and Spa, for Mr. George Newnes, M.P. Messrs. MARKS, MUNRO & SON, Architects, Bristol and Birmingham.

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Cowlin & Sons, Bristol	5,543	0	0
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F. Barke	3,931	17	10
S. Hutton	3,327	0	0
F. Lunt	3,199	14	6
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For Widening, Making, Forming, &c., of West Street, for the Town Council. Mr. GEORGE EATON-SHORE, Borough Surveyor, Temple Chambers, Exchange Street, Crewe.

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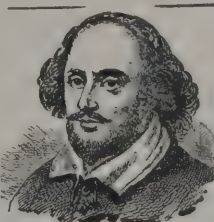
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Somervail & Co., Dalmuir, Glasgow	213	16	2
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D. Parfitt, Newport	2,580	0	0
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M. Julian, Pontypridd	7,014	0	0
David Jones, Pontypridd	6,685	14	0
D. C. Jones, Gloucester	6,538	8	8
C. Gardner, Newport	6,329	0	0
R. Mathias, Pontypridd	6,315	14	6
Watkin Williams, Pontypridd	5,800	0	0
Williams & James, Pontypridd	5,596	0	0
W. Thomas & Co., Cardiff	5,436	15	5
JAMES ALLAN, Cardiff (accepted)	5,434	9	6
Surveyor's estimate	5,187	11	0

THE BUILDING EXHIBITION.

THE Building Trades Exhibition opened on Saturday, the 11th inst. The exhibits deserve the attention of architects and builders and all who are connected with building operations, for although they are not as numerous as on other occasions, perhaps, nearly in every case what is shown is of more than usual interest, due to the firms whose reputations have been made by good workmanship, and who more than sustain that reputation by the high standard of excellence to be seen in the objects and appliances arranged at the various stands. Many exhibitors cannot be spoken of, as their contribution to the show this week has been confined to raising dust in the building and preventing conversation by the noise of continual hammering.

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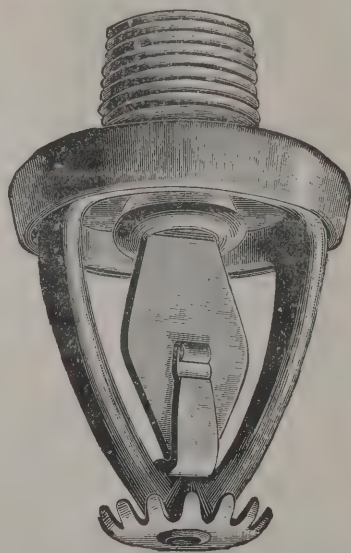
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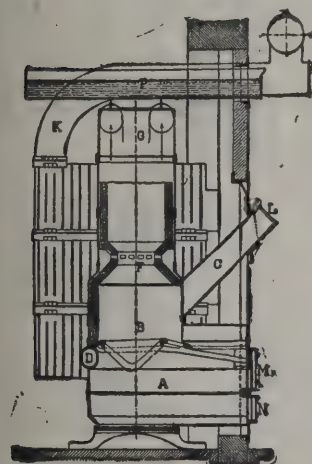
recognition also in regard of the practical utility of the appliances shown, and which, according to their class, are to be seen also under the most pleasing aspects when ornamental effect is desirable or requisite. Among the appliances shown is a beautiful range that any cook might be proud of possessing. It incorporates all the improvements that the experience of years has developed. It can be used as open or closed fire as required, and the arrangement for lifting the fire—it can be raised to any height from the bottom—is invaluable as regards economy of consumption of fuel altogether, and enabling cooking or heating operations to be performed quickly and without waiting for the resurrection of a low fire that otherwise has to be rekindled by the deadening process of recharging it with fuel.

One of the firm's latest patent stoves is shown encased with exquisite taste in walnut wood chimneypiece and overmantel. It is a slow-combustion stove, with fire-brick back with perforated bottom, and regulator ventilation arrangement. Another fine specimen of work is a dog-stove and irons of wrought-iron in large chimney or dog-opening, the effect of the walnut mantelpiece being enhanced by colour and design of the tile lining. Among the other handsome slow-combustion stoves a patent one (Wm. Vyse's) shows a good sample of the effect of tilework, as it is judiciously introduced in combination with plain enamelled wood mantel. Another handsome stove in brasswork is fitted in mahogany chimneypiece, a feature in the latter being the rich blue cloisonné enamel inlay-plaques. The Dutch figure-work in blue of the tile slabs shown in another dog-opening attracts attention, as it creates a pretty effect in combination with the wrought-iron dog-grate worked out in simple treatment. Among other types of slow-combustion stoves the "Norfolk" patent slow-combustion stove is well mounted in a fine walnut-wood mantelpiece, with ornamental tile jambs. The one enriched with brass and figure-work is worth notice for itself, as well as in connection with the tile treatment, the pictorial panels in tilework being executed in sepia, which imparts richness to the landscape effects delineated. There is much to admire in the specimens of ornamental wrought-ironwork shown. Among this class of work is included work for lamps, wall-brackets, standards, hanging lamps, &c., which, as shown, fitted with lamps and glasses, shades, &c., produce a telling effect. The sample shown of a register for small rooms should be made mention of. Small registers are too often useless; after much lighting to make the fuel they burn create a draught, they will not radiate heat, but, to

judge from the construction of the above-named registers for small rooms, these undesirable conditions will be found to be reversed. The slow-combustion stoves, which may be had for all purposes and to suit all requirements from Messrs. Barnard, Bishop & Barnards, of the Norfolk Ironworks, Norwich, have all practical merits to recommend them for use, if a maximum of heat with the minimum consumption of fuel, combined with cleanliness from dust, obviation of smoky chimneys, and the capability of keeping at work with little attention while at work, are to be considered advantages. We would recommend a personal inspection of the exhibit to our readers when visiting the Hall.

Alfred T. S. Carter.

A large and pleasing assortment of tile work is shown by Mr. Alfred T. S. Carter, of the Tile and Mosaic Works, Brockley, including tilework for all purposes, architectural faience, marble mosaic work, ceramic mosaic for flooring, &c. One feature of the exhibit to be noticed is that all the tilework has been set in cement, thus enabling architects and builders to judge of the constructive qualities of the materials. Tiles are shown, encaustic, glazed, enamelled, embossed, hand-painted and other tiles, all these for walls, floors, &c., respectively. Some entirely new and pictorial designs are shown in tilework suitable for butchers' establishments, dairies and the like, dairy and other subjects being depicted. There is so much, however, that is new that an inspection of the actual exhibit is necessary, as only a few salient features can be mentioned here. The architectural faience includes fine majolica pilasters, capitals, cornices, friezes, architraves, &c., in good designs and correct style, and may be seen extensively used in hotels, restaurants, public-houses, &c. A variety of fine tiled hearths are shown, with a series of glazed tile fender curbs. A novelty of a desirable nature is seen in the curbs, which are formed of whole lengths of tile instead of being a number of short lengths cemented together. A tile treatment for dairy walls in panels is quite new in regard of colours. The effect is extremely good, but this is shown for the first time. A drawing-room table in glass mosaic is rich in colour, with red, white, gold and blue. The White Horse of Kent is depicted in glazed mosaic, and an emblem familiar to students of Winchester College is said to be the smallest figure in this country worked in marble mosaic. A specimen of glass mosaic for church decoration showing a saint has only just been completed. The floor mosaics include hand-placed marble



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GOLD MEDAL, Inventions Exhibition, 1885.

tesseræ and granite marble mosaic forming an economical flooring material.

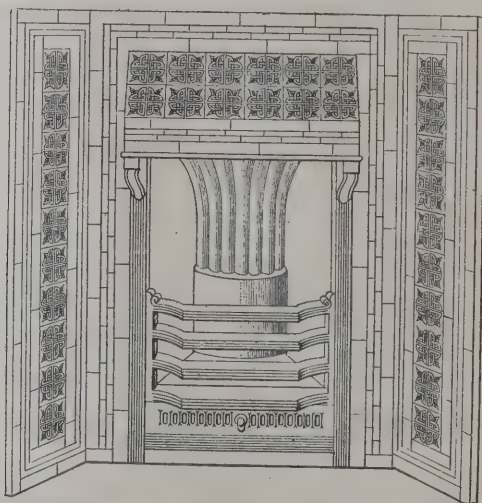
Merryweather & Sons, Limited.

An exhibit that strikes the eye of a visitor on entering the hall is that of Messrs. Merryweather & Sons, Limited, hydraulic engineers, 63 Long Acre, W.C., and Greenwich Road, S.E. In addition to the general exhibit, it will be found that much care has been taken by the management to include many minor details which are of interest, which we do not pretend to allude to in this short paragraph. It may be mentioned, however, that all classes of appliances for fire-extinguishing are shown, and the character of the materials and the workmanship should be noticed; these appliances regard safety to life and limb, and workmanship and all else is of the very best. Cheap imitations would prove worthless in action and augment loss of property and life. One appliance directly inviting the attention of architects, engineers, &c., of builders and contractors, is a portable steam pumping-engine, "The Valiant," a slightly detailed description of which should be of interest. Taking into account the small size of the engine—that a man can wheel it from one place to another, and that dismantled from the wheels it is an easy task for four men to carry it off bodily—its forcing power seems altogether in excess of what could be expected, not to mention the quick steam-raising power of the boiler to which the pump is attached; the boiler being of the Merryweather type of quick steam raising, which raises steam from cold water in seven minutes from the kindling of the fire. As to force, the capacity ranges as required by circumstances from 80 to 120 gallons per minute, with a power to deliver water as a fire-jet through 90 feet of hose to a height of 30 feet. This little engine, it appears, will deliver water through three miles of hose, and on estates, farms, &c., for irrigation and other purposes is found most valuable. It is used by water-engineers for washing out reservoirs, cleansing gravel, &c. It has been supplied in large numbers to builders and contractors who require the services of a powerful but portable pump to get rid of water during excavations. Its use is also recommended to borough engineers and surveyors for use at sewage works, getting rid of flood-waters, &c. It is used in connection, moreover, with the Merryweather hydraulic sewer-flusher, an operation which was described some time since in *The Architect* as witnessed in Leicester Square. Among other places, one is in use by the Vestry of Mile End Old Town. One was also used in cutting

the ditches and canals for the Hague Waterworks. A large assortment of fire-extinguishing plant is exhibited for protecting private mansions, public buildings, mills, warehouses, &c., from fire. An especially useful article that may be named is the London Brigade hand-pump, that throws a jet of water 50 feet from the nozzle. It is estimated that more than half the outbreaks of fire in London are stopped by this little appliance. The "Chute" fire-escape, made of specially woven canvas, is a simple and effective appliance. When required it is fixed at once to a window, and the long canvas tube unrolls simultaneously to the ground. The "Chute" can be adapted to any window, and it meets the requirements of the new factory Act. An assortment of ground hydrants, stand-pipes, &c., for protection of towns from fire is shown; also a large amount of hose (the sphincter grip-armoured hose), which is practically indestructible, being protected by galvanised steel wire. It is invaluable for builders' use for conducting water to all parts of the work during building operations. All information respecting the Merryweather specialties can be obtained from Mr. J. Batcheler, under whose management the exhibit is. A novelty that may be mentioned is the decoration of fire-buckets, showing the coat-of-arms of any special company or brigade.

Wilson Engineering Company, Limited.

Among the excellent specialties shown by the Wilson Engineering Company, Limited, of 227 High Holborn, is a monster gas-roaster, capable of roasting an ox whole. Gas-ovens for cooking pastry and requiring sharp heat are shown, also gas hot-closets with cutting-dish combined, for use with either gas or steam; gas-cookers, a feature of these being that no gas can enter the ovens; potato-steamers for large hotels capable of cooking three bushels at a time; also a specialty in the way of a coke-grill for large hotels, restaurants, &c., fitted with tiles, and having hot-closets, &c. There is a representative assortment of the Wilson ranges in different sizes and to suit all requirements, and which now are all fitted with rising fire arrangement and can be used for open or close fire. One shown is specially suitable for coffee-houses, having two large and very hot ovens and a boiler-capacity of ten gallons. All kinds of sanitary appliances are shown, such as have to withstand traffic. Manhole covers, gratings, &c., some in galvanised iron and others in cast-iron, are extremely durable. All the work, cast and figured as well, was manufactured at the foundry and works in Goswell Road.



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INVENTORS AND ORIGINAL MANUFACTURERS OF

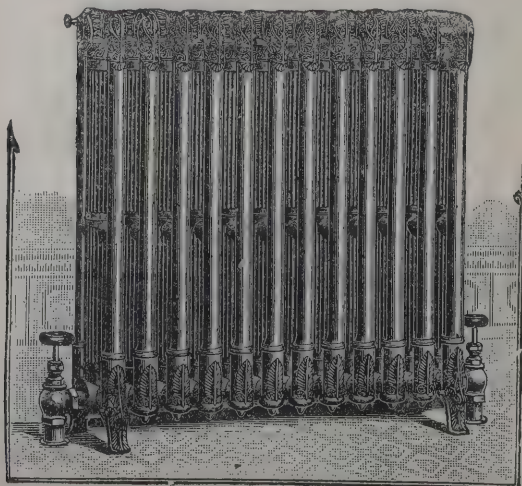
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Turpin's Parquet Floor, Joinery and Wood-carving Company, Limited.

As on many previous occasions a beautiful display of the ornamental wood-carving and parquetry is on view at the stand of this company, the whole of the exhibits having for background a magnificent carved chimney-piece overmantel, &c., suitable for a banquetting-hall. The patterns in wood-parquetry and marble mosaic are varied, and show that there is a wide margin of choice available in working out any desired scheme of decoration. The managing director, Mr. M. T. C. Turpin, aided by a most competent staff trained under him, has steadily improved the manufacture of the company's specialties, and he has lately patented a new system of constructing wood-block floors, which has been pronounced by some expert authorities as the best of known modes of interlocking wood floor-blocks.

King & Smith.

Messrs. King & Smith, Stowe Works, Weedon (London office, 59 Haymarket), show their patent honeycomb wine-bin. The construction of this wine-bin is altogether a novelty. Each receptacle for a bottle is a separate tube, made of terra-cotta, hexagon or honeycomb shape outside and circular within, just large enough to take a bottle easily. In new buildings they can be built in the walls, thus making the cellar 1 foot larger each way. Crushing strains can be had. The tubes are stacked in honeycomb fashion in any space desired to be fitted up as a wine-bin, and require no kind of fixing, as they fit into each other, and from ten to twelve tubes go to 1 square foot of wall-surface. The advantages claimed for this system are:—Simplicity and cheapness. The great number of bottles that can be stored in a given space and their adaptability to spaces of irregular form and odd corners. Each bottle having a separate chamber is protected from currents of air and sudden changes of temperature, and the breakage of one bottle cannot affect any other. The tubes (little larger than a bottle) can be handed down awkward cellar stairs down which framed racks would not pass. Being porous, the tubes will absorb water sprinkled over them, and the evaporation that ensues will materially reduce the temperature, so that where wines and aerated waters are required to be kept cool the patent "Honeycomb" wine-bin becomes a simple and ready form of refrigerator when so treated. Unless otherwise ordered, the tubes are made to suit ordinary wine bottles, and will, of course, do for smaller sizes, but they can be supplied to suit bottles of any size.

Baillie & Lutwyche.

The art of decorating glass and tiles by means of vitreous enamel in relief seems to have made great advancement both in the material and designs, as exhibited by Messrs. Baillie & Lutwyche, whose ateliers are at 19 Goulton Road, Lower Clapton, N.E., Stand 66. A glass ceiling effect with enamelled star centre is shown, also an inside skylight (the ornament turquoise and gold) has almost a better effect by artificial light than by daylight, and does away with the dreary blankness of plain or stained-glass. A black and gold ornamental panel is good. There is also the old willow-pattern plate—a most effective and peculiar treatment in blues and whites—an Italian Renaissance panel, and a fish and water panel. These are decidedly worth notice; also a Japanese blind. A bunch of orchids is remarkably effective, both as regards the modelling and shading. There seems to be no limit to the usefulness of this work, and as the enamel, being a glass itself, is fired into the glass it becomes quite permanent. It needs only to be seen to be appreciated. We understand extensive work has been executed for Germany, France, the West Indies, Ireland, and in this country, but we have seen little of it in London. We strongly advise a personal inspection to be made of this exceedingly interesting exhibit. The glass and tile work, it should be mentioned, show by reflected light and transmitted light, therefore by night as well as by day.

St. Pancras Ironworks Company.

This company's exhibits are characterised as usual by high class workmanship. Varieties of ornamental iron staircases, including spirals, are shown, also their well-known improved stable fittings. Pavement lights, coal plates, &c., and a large assortment of lenses are shown, also the balanced cellar-flaps, in combination with a stall-board for warehouse purposes, the appearance being of a graceful character, and in it for purposes of ventilation a hopper opening has been ingeniously introduced.

T. S. Knight.

The exhibit of Mr. T. S. Knight, 222 Great Portland Street, is an attractive one. A range is shown which may be described as a combination of the Yorkshire and Leamington principle. One of the ovens is called the patent collapsible. With two movements the oven disappears, and then the whole of the hot-plate is available for boiling purposes. The range is for open or close fire, as desired; and the patent lifting fire arrangement secures some 50 per cent. reduction in regard of con-

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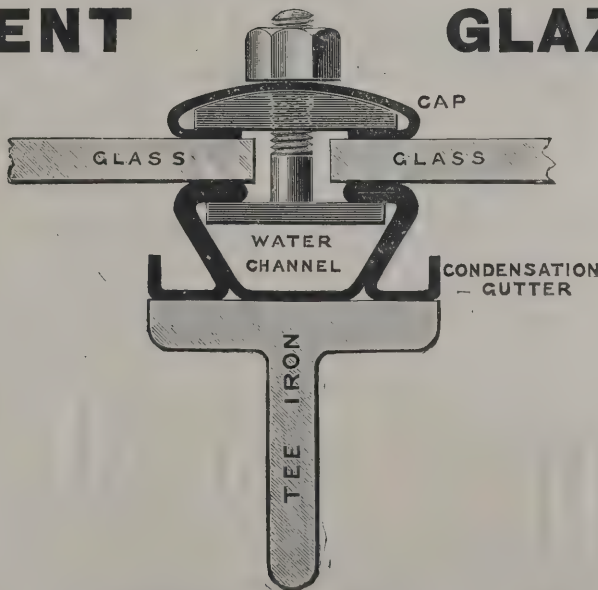


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sumption of fuel. Another feature is the cinder-sifter, which catches fallen fuel and riddles the cinders when they can be, so to speak, reburnt. In economy of fuel it is considered that this range supersedes all other ranges. The apparatus has secured gold and silver medals at various exhibitions. In addition to side boiler containing nine gallons there is a circulating back boiler for sixty gallons. This is shown in working order in combination with a copper cylinder which in twenty minutes will supply water hot enough for an ordinary bath. Russell's patent "Tit-bit" stove is exhibited. Connected with it is a peculiar feature, which cannot fail to be of use to numbers of persons, applicable to breakfast or dining rooms, as also for nurseries. The canopy of the stove is utilised, and practically forms, when required, an oven, in which toast or other warmed articles can be kept warm in case of necessity. The principle is that of the duplex Waverley, so much favoured both in London and in the provinces. The whole appliance is handsomely shown with tiled sides, chimney-piece, &c., tiled hearth and brass curb, all in character. Another of the Russell patent stoves has two qualities to distinguish it from any other in the market. According to the regulation of the canopy, drawing it forward or pushing it back, an aperture at the back is accordingly opened or contracted, allowing free passage for smoke, a movable valve or damper being attached to bottom of canopy for closing when the fire is not in use. The second feature is that the canopy can be converted at will into a blower, and in case of chimneys liable to smoke this would prove a thorough preventative. This is exhibited for the first time. This stove also is made on the duplex Waverley principle, neatly arranged throughout and having tiled hearth and brass fender curb. The adjustable grill (on rackwork) shown, we should mention, will prove an invaluable adjunct to any range.

J. M. Bennett & Sons.

The present opportunity of seeing the beautiful work obtainable by the use of "Goehring," the correct pronunciation of which is as in that of the word "gearing," should not be missed by visitors, still less by practical business persons, as the artistic and useful capabilities of this process of using natural and everyday materials, as shown, must commend itself to all. The exhibit shows the wide range open to a decorator by use of geometrical mouldings which are cut out of solid woods of nearly every kind. The beauty of prized woods needs no explanation, and the process is not confined to ordinary woods,

and so style and design are not limited in that direction. Something of a novelty is seen in wavy-moulded work, which is so accurately worked that the tongue and groove joints are absolutely undistinguishable, and it must be noticed that the tongue and groove are worked in wave and not on the straight. It would therefore appear that those who use matchings, and perhaps, have to make them, will obtain great advantage by using Bennett's Glen Cove Standard Gauges, as they ensure that any of a thickness will match without any extra labour in easing the tongue, a difficulty which our readers will readily appreciate. At the exhibition Goehring moulds are shown in furniture, shop and office fittings, internal decoration, constructional and dado work, picture frames, &c. The sole manufacturers in the United Kingdom are Messrs. J. M. Bennett & Sons, timber merchants, Manchester, and Suffolk House, 5 Laurence Pountney Hill, Cannon Street, London, E.C. In a previous issue we gave an illustrated description of "Goehring," to which we refer our readers, while at the same time we advise them "to go and see for themselves."

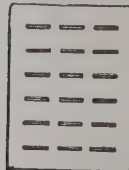
Cork Pavement Company, Limited.

This company, 7 Great St. Helen's, E.C. (works at Creek's Mouth, Barking), show their patent cork pavement, which possesses the following advantages, viz.:—Secure foothold for horses or pedestrians in any weather, and forms a perfect roadway: extreme durability at a very moderate cost; a perfect preventative of noise; a non-absorbent, inodorous sanitary roadway, unaffected by variations of the weather or temperature; the cork bricks can be made of various sizes and thicknesses, to suit all purposes as may be required. It is also admirably suited (and is now being extensively used) where dry, warm and sanitary floorings are required for such purposes as railway station platforms, subways, footways, carriage drives, stables, stable-yards, coach-houses, loose boxes, kennels, drill-halls, church aisles, magazine floors, exhibition floors, tennis courts, bicycle and running tracks, &c. Nothing need be said to recommend the cork pavement. It is, we believe, a compound of cork and bitumen, and may be called a sanitary material, both directly and indirectly. Indirectly, being noiseless, the nerves of many can be saved from suffering; also in stables, kennels, &c., it may be said to give rest and comfort to animals, somewhat akin to the comfort of sleeping oneself on a good bed instead of a hard board. The elastic properties of cork pavement will readily explain this and account for extra durability and wearing qualities. It is not

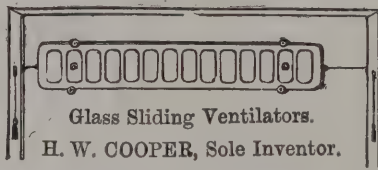


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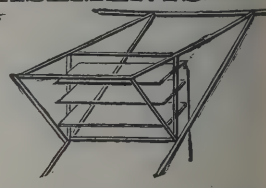
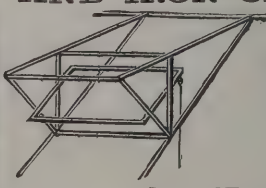
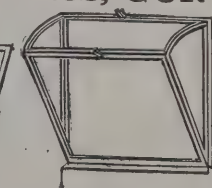
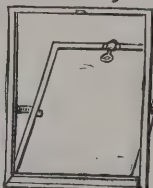
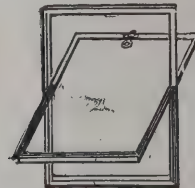
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necessary, however, to say more, for many who are not likely to adopt the system without good reason have done so, and are pleased with the results. As prominent persons and Government—or, perhaps, we should say, military authorities—have recognised the merits of cork pavement, it may not be too much for the company to expect that the use of the material will be promoted by those charged with keeping in order the carriage-ways of our towns. Among the places where the pavement is laid are the following:—At the Watch House Battery, Citadel, Plymouth; H.M. Prison, Holloway; Life Guards, Knightsbridge; Raleigh Club, Regent Street; Tattersalls; Pickford & Co., both in London and Croydon, &c. On the particularly steep gradient under the Great Eastern Railway Hotel it has been laid, with marked success as the result; also in Deptford Road, to order of the Greenwich Board of Works, where the traffic is enormous, and this to the benefit of the frequenters of the church. The Caledonian Railway, Princes Street, Edinburgh, have adopted it, the Great Western Railway, &c., and the Aylesbury Dairy Company and many private owners also have made use of the pavement. Also the Master of the Cleveland Hounds, Mr. Wharton, Mr. Lloyd Price, Master of Herries, Mr. Athol Hay, who considers his stables show the best paving in Scotland. For kennels and stables it appears to be most suitable, and in stables economical as regards straw compared with the consumption of equine bedding where other paving is used, and in kennels useful in keeping off kennel lameness.

Joseph Robinson & Co., Limited.

Messrs. Joseph Robinson & Co., Limited, of 206 Phoenix Street, Somers Town, N.W., manufacturers of plaster of Paris, Keene's, Parian and Martin's cements, also of Robinson's fireproof cement, show their system of plastering, and they have afforded visitors to the Hall the facilities of seeing the work actually carried out. We have described before the peculiar merits of the fireproof cementing and plastering, which it must be understood is for interior use. The exquisite surface obtained for walls, &c., rivals that of marble, and shortly after the plastering is completed the wall is dry and ready for any other treatment required, painting, &c. The putting on the plaster is also done in far less time than by old-fashioned methods, and therefore there is a distinct economy in cost and saving of time and labour. We may repeat what we said on another occasion, that Captain Shaw highly approved of Robinson's cement as a protection against the spread of fire.

The whole of the work at the stand of Messrs. Robinson has been carried out by the Fireproof Cementing and Plastering Company, of Westminster Chambers, 13 Victoria Street, S.W.

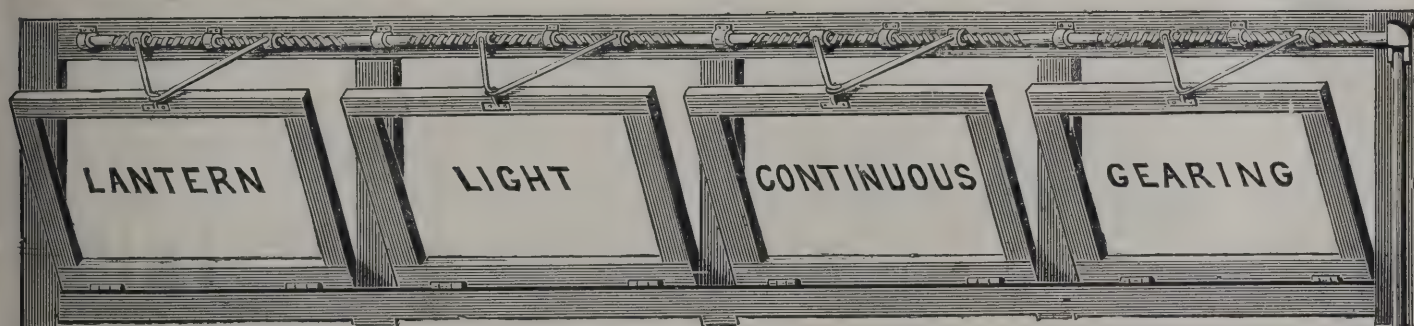
Duff & Spagnoletti.

Messrs. Duff & Spagnoletti, of the Hogarth Studios, Charlotte Street, Fitzroy Square, show fine examples of their beautiful work in stained-glass for ecclesiastical and domestic purposes, and also a large number of beautifully-designed windows that they have carried out. There is a fine east window for a church in Coleraine, "Christ blessing His Disciples;" also windows for the church of St. James, Belfast; Balaklava Church, Melbourne, and one for Downpatrick Cathedral, "Charitas." A curious and fine effect of colour is seen in a small work representing Touchstone and Audrey from "As You Like It." A fine classical figure in another work represents "Music," and some beautiful samples of heavily-coloured glass representing various subjects are also shown. They execute all classes of stained glass, from the plain geometrical glazing to the richest church figure-work; and while their prices will be found to compare favourably with other firms, they guarantee the best drawing, harmony of colour and general workmanship.

Fryer's Patent Cows.

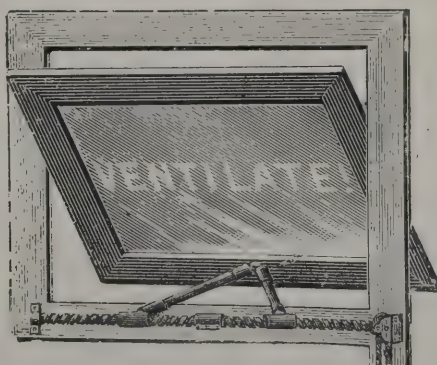
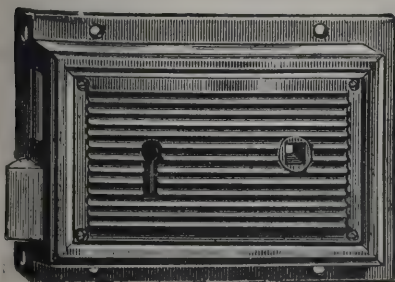
Fryer's patent cows are shown at the stand of Mr. Walter Monnery, of 69 Southwark Bridge Road. Among the advantages claimed are the following:—That they are a cure for down-draught under all circumstances; have a square base which gradually tapers off towards the head; cause no choke to the smoke as round base cows; that the inlets, which are bonnetted over, are so arranged on the four sides of the base that the outer current is drawn upward, causing about 100 per cent. greater up-draught; noiseless at work; bearings move in oil; no friction; revolves in the slightest current; it has an open head, which allows the smoke to issue freely; there is no obstruction to the sweep-brush, and they can be swept as easily as a chimney-pot; the tubular upright shaft holds a supply of oil for years; the bearings are covered over with a brass collar which renders them perfectly dirt- and dust-proof; the head cannot blow off in a storm; the wings of the cowl-head are kept in position by two strong circular wire stays; the hinge-flap on top of head provides easy access to the bearings; they are strongly made of galvanised steel sheets; no seams; no

HILL'S PATENT LOCKS & OTHER FITTINGS.

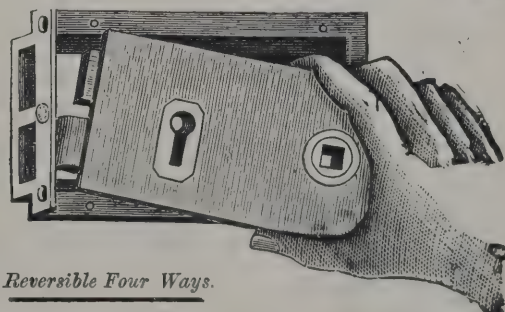


Hill's Patent Gearing for Fan-lights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod.

(3)



Buyers should satisfy themselves that goods offered by other firms do not infringe Hill's Patent Rights.



Prices and Particulars on application.

Reversible Four Ways.

JAMES HILL & CO., 100^A Queen Victoria Street, London, E.C.

solder; all parts being rivetted, which renders them perfectly fire-proof; a snowstorm does not impede their action and they are the only cowl which will revolve in a fog.

Joseph Kaye & Sons, Limited.

The specialties of Messrs. Joseph Kaye & Sons, Limited, always form an attractive feature at the Building Trades Exhibition. We have before now alluded to the useful appliances that seem easy to Mr. Kaye to invent for any purpose, particularly in regard of door appliances, locks, &c., of every kind. One among the many interesting inventions is the railway lock we have described on a former occasion, and which is now shown at the Hall with a new and most ingenious as well as practically useful addendum in the shape of a covering-flap for the inside of carriages. This is, however, easily lifted, and then the mechanism is at once ready to the hand to open the door. It is Kaye's patent automatic wedge lock, the form being somewhat modified to suit railway carriages, private carriages, broughams, &c. It is a favourite with those who have tried it for ease in opening and closing doors, preventing settling, and general safety. The durability and immunity from broken parts, handles, &c., is also to be considered. The lock shown at the Hall has been opened and shut about a million times without showing wear. Outside Mr. Kaye's establishment in High Holborn every boy that passes opens and shuts the door which is invitingly placed within reach of the passers-by. Hence the number of times the lock has been opened. The Prince of Wales, Lord Suffield, and others of the nobility have adopted the lock for their broughams. Kaye's patent door-ports are a most useful invention, and should be inspected along with the rest of the appliances shown. Mr. Kaye, the inventor, is in constant attendance himself, and thoroughly explains the various useful locks, &c., which form the attraction of his exhibit.

E. S. Hindley.

Mr. E. S. Hindley, of Bourton, Dorset, shows his excellent vertical and horizontal steam-engines, also a horizontal steam-engine in combination with a vertical boiler, one of Hindley's well-known vertical boilers, both being mounted on a substantial water-tank requiring no brick foundation. The boilers have been recently greatly increased in size, the fittings and mountings being of a superior quality. Every boiler is proved to 150 lbs. per square inch, and every engine is well tested under steam before leaving the works. These engines combine

many improvements not usually found in those of moderate price. The bed-plate, crank-shaft bearings and guide are all cast together in one piece; the cross-head and slipper have extra large wearing surfaces, and are adjustable. The cylinder is neatly lagged with polished mahogany and brass bands. The feed-pump is of improved construction, and will use water almost boiling. The fly-wheel is wide, and is turned for a belt; it can be placed on either side of the engine, the crank-shaft being long enough to carry a pulley at the other side. The variable expansion gear affords a valuable means of adapting the power of the engine to the exact amount of work to be done, and thus conduces to economy in fuel. The governor is of the high speed equilibrium class, and has been found to give an exceedingly uniform motion to the engine, even under considerable and sudden variations of work; it is adjustable while running, hence this engine has been much approved for electric light purposes. All parts being made to template, gun-metal bearings, &c., can be replaced with new ones when necessary without the assistance of a mechanic, the seats or carriages for the bearings being bored to receive them, and the bearings themselves being turned externally. Condensers can be added to engines of 10 horse-power and upwards.

Robert Adams.

The well-known specialties of Mr. Robert Adams, of 67 Newington Causeway, are to be seen at his stand in the exhibition at the Royal Agricultural Hall. Those visiting the exhibition will be repaid by examining them and seeing them in practical work. To mention some among the excellent inventions which Mr. Robert Adams has spared no trouble to put in reach of the public as effective appliances at the most reasonable prices, among those that may be mentioned are Robert Adams's new patent spring hinges, including the Crown Victor double action spring hinges, which open wider than any other and close the door with absolute silence from the angle of 135 degrees; that is, 45 degrees wider than ordinary hinges. Also the London Victor single action spring hinge, which opens wide back—to nearly 90 degrees wider than others—and closes the door with absolute silence. These are guaranteed to be the most durable spring hinges in the market, invaluable for banks, &c., for hard wear and rough usage. Robert Adams's new patent combined door-spring, set opener, and silent check is a spring more especially (but not exclusively) designed for public-house doors. It sets the door open at the angle desired,

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**PATENT GROOVED AND CHANNELLED
GRANITE CONCRETE PAVING
STABLES.**
Jointless. | Impervious. | Economical.

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House Cistern, fitted with a Cistern Filter. **PATENT CISTERN FILTERS.** Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. *Vide* Professor Frankland's Reports to the Registrar-General, July 1866; November 1867; and May 1870. *The Lancet*, January 12, 1867.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1873.

Price, £1 10s. and upwards. Portable Filters on this System, £1 5s. to £3.

Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Bagshot Park, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession, and at the London, Middlesex, St. George's, St. Mary's, Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4s. 6d. and 6s. each. Household and Fancy Filters, from 10s.

Water-Testing Apparatus for detecting Impurities in Water, 10s. 6d. and 21s. each.
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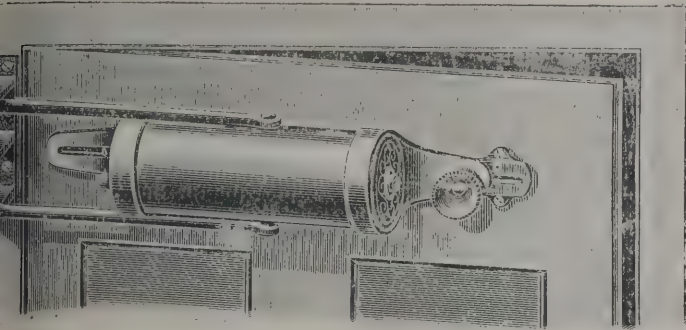
Gold and Silver Picture Wire.

WIRE ROPES.

Established 1875. Telegrams:—"Orchard."



thus dispensing with the leather straps and lancewood springs, and closes the door with absolute silence. Robert Adams's patent Empress Victor door-spring, with all latest improvements, can be fixed inside or outside of the door, either right or left hand side, by means of the universal fittings, and is the only spring possessing this advantage. It also closes the door with absolute silence. Robert Adams's patent Queen Victor single action floor-spring with silent check action; also his patent hurricane Victor double action spring hinge, also with silent check, are shown. Attention should also be called to Robert Adams's patent fan openers, link motion. These openers have been specially designed to be universally appli-



cable for fanlights on hinges or pivots, easily fixed, neat in appearance, with screw rod action. The movement is smooth and noiseless, and the sash is locked wherever the handle is left. Also shown is Robert Adams's side gusset draught preventer, composed of metal plates, which fold up on the face of fan and frame. It is durable, efficient and neat. Also numerous other fanlight and skylight openers to suit every conceivable light, and special gearing for opening ranges of sashes of any size. Also Robert Adams's patent triple action casement bolts, ornamental or plain; and these bolts are greatly appreciated for their utility, strength, and superior appearance. The patent tongued casement bolt excludes all weather and draught, and forms a dead-lock. There are also other specialities in the way of bolts for entrance gates, &c.

Walter Monnery & Co.

It is needless to write that the well-known wall-ties, for the production of which Mr. Monnery has been so long celebrated, are exhibited in large numbers and great variety at this stand. But there is also a large display of other specialties selected from the stock at 69 Southwark Street, S.E., which are interesting and instructive to architects and builders. There are some extremely handsome tiled register stoves, with ornamental chimneypieces of various descriptions. Messrs. Monnery are agents for Fryer's ventilating appliances and patent chimney-cowls. It is only necessary to examine this exhibit to discover at once that both the ventilators and the cowls are economical and effective. A very ingenious invention is also to be seen, which is for the use of plumbers, and removes all the well-known difficulties which so frequently arise in the bending of pipes.

Randall Hardened Stone Co.

The Randall Hardened Stone Company show the application of their building solution to the hardening of stone, lime, mortar, &c. Its advantages in obviating all hindrance to brickwork in winter, and converting a soft stone into a hard one, ready to be polished, are inestimable, and should appeal to a very large class. The works of the Randall Hardened Stone Company are in Kentish Town Road, N.W.

Rindesland & Pattenden.

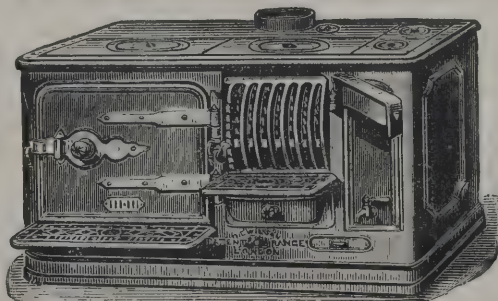
The Brülöo patent window reappears in an improved form, and as a thoroughly skilful invention it deserves the attention of visitors. The first advantage is that it can be cleaned on both sides whilst standing in the room, and therefore without the slightest danger to life or limb. It cannot be opened from the outside without breaking the glass. Broken panes can easily be replaced without getting outside. The windows never rattle in windy weather, and can be thrown open for ventilation 3 inches from the top and 3 from the bottom without the use of hammer, chisel or any other tool, or disturbing or shifting any of the beadings, which is a considerable advance upon anything of its kind. There can be no doubt that the Brülöo window combines all the advantages without the defects of some of its rivals. The mechanism in this case is perhaps more apparent, but then it attains many purposes, and is indeed a thoroughly careful and matured invention. The numerous accidents which might be avoided by the use of

The "Wilson" Portable Cooking Ranges, With Lifting Bottom Grate for Regulating Size of Fire.

JUST AWARDED THE GOLD MEDAL AT THE UNIVERSAL COOKERY EXHIBITION, PORTMAN ROOMS.

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than any others.

THE WILSON ENGINEERING CO., LIM., 227^K HIGH HOLBORN, LONDON.

Electric Lighting and Power.

THE WEYMERSCH BATTERY.

[ED. C. DE SEGUNDO, M.Inst.C.E.,
Executive Engineer.]

CAPITAL, £20,000.

[CH. F. JONES,
Secretary.]

The Weymersch Battery Company, Limited, beg to announce that their Battery can be seen in operation on Friday in each week, driving Ventilating Fan, Water Pumps, Electric Lamps, and also Charging Accumulators,

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OFFICES AND SHOW-ROOMS:—

VICTORIA MANSIONS, 28 VICTORIA STREET, WESTMINSTER, S.W.

the patent Brülöo window should induce visitors to give it an inspection. The patentees and manufacturers are Messrs. Rindesland & Pattenden, 461 Harrow Road, London, W.

Charles Davis.

Mr. Charles Davis exhibits at Stand No. 19 some of the high-class blinds and fittings for which the firm has a reputation extending over nearly a century. The point to be noted is that work of a common description has no place here, and high-class work is only undertaken. Mr. Charles Davis makes a specialty of his outside improved Spanish blinds, as well as of duchess lace-blinds of the newest designs and patterns, and the highest class venetians with the latest patent actions, cane and wire blinds, Japanese screens, &c. The firm's patent brass railway grooving laths and cornice poles are generally adopted by the trade, and specified by the leading architects. The only fault to be found with the exhibit is that it conveys but a slight idea of the large business of the firm. A comprehensive illustrated price list is now, however, being issued, and will be found to contain many of the new designs for this season. Architects, builders and the trade will find in them many useful ideas for exterior decoration. The works and offices are at 40 Castle Street East, Oxford Street, W.

W. Garstin & Sons.

Messrs. W. Garstin & Sons are again at the Exhibition, and, needless to say, it would be an invidious task to find the least fault with their exhibit; indeed, we consider it one of the most artistic that has ever been submitted to the public. The stand is divided into two distinct departments—the architectural and monumental—and the contrast is striking. On one side is seen the infinite variety of granites, marbles in the rough and manufactured state appealing to the architect, presenting a wonderful harmony of tints, and on the other side, the beautiful purity of white statuary monuments, &c., conveying that very tenderness and sympathy which they are designed to express. We think this arrangement of the exhibit adds to the effect, and enables the visitor more easily to comprehend the different branches of the business of Messrs. W. Garstin & Sons. The granite and marble departments are of themselves bewildering in their variety. Some of the granites shown are Scotch, Swedish, Norwegian, Labrador and Bavarian; and of coloured marbles, Italian, Belgian, Swiss, French and Irish, each has its special colour and requires particular treatment in the subsequent process of handicraft. It is held amongst the *cognoscenti* that freedom from blemish and perfect polish are indis-

pensable, and it should be obvious to anyone that unless a firm thoroughly understands the selection of the suitable rough material and how best to utilise it, it has no chance in competition with Messrs. W. Garstin & Sons; for in their case they do all this, and in some cases possess the quarries from which the granites come. Bavarian granite, for instance, arrives direct from the quarries in Bayreuth, Bavaria; Italian marble from the works in Massa Carrara; and quite recently an Aberdeen branch has been acquired for the Scotch granite trade, and the firm are members of the Aberdeen Granite Association. These facilities for carrying out every branch of the trade should commend themselves to those interested in high-class work. The infinite variety of selection is another point of which the exhibit will convince; but the works and showrooms at Kensal Green, W., are well worth a visit. The demand for architectural requirements is continually on the increase, and doubtless their value will soon be more generally recognised. Messrs. W. Garstin & Sons have recently fitted, under the direction of a firm of eminent architects, an hotel in Glasshouse Street, Piccadilly, W., with bars, pillars, &c. Granite-tipped tables are another specialty, which have a very pleasing effect. We hope the few particulars above will induce visitors to examine the exhibit in detail; or, failing a visit, to write to the works at Kensal Green, W., for new illustrated catalogue. The practical management of the large business devolves upon Mr. Aubrey Garstin, and the work comes directly under his supervision—a guarantee that it will be well done. The marble table tops and counter tops just introduced are particularly worthy of notice. The exhibit is highly creditable even to so enterprising a firm, in the variety of marbles and granites shown, not only in ornamental style, but in plain work. Messrs. Garstin & Sons are the sole consignees for Bavarian granites, besides being importers of Sicilian statuary and coloured marbles, foreign granites, &c. As already stated, Messrs. Garstin & Sons have an establishment in Aberdeen, The Polished Granite Works, in South Constitution Street. Besides the department that pertains directly to the requisites of architects and builders, the monumental department will be found full of interest for every visitor. Both Italian and English carved work is shown, and several beautiful specimens of workmanship are to be seen.

H. Cunnah, Wright & Co.

Messrs. H. Cunnah, Wright & Co., who show their patent fireproof construction system, are to be commended for the expedition with which their exhibit has been completed. The

Awards Obtained:—LONDON, 1862, 1874; PARIS, 1867, 1878, &c.

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ARCHITECTS are invited to SPECIFY it for small Electric Lighting Plants.

ADVANTAGES.—The Framework is cast in one solid piece. The Armature can be taken out in a few seconds. There are no loose wires dangling from the brush-holders. The "Infant" Dynamo attains the high efficiency of 92 per cent. Full particulars and prices on application.

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MANSFIELD STONE,

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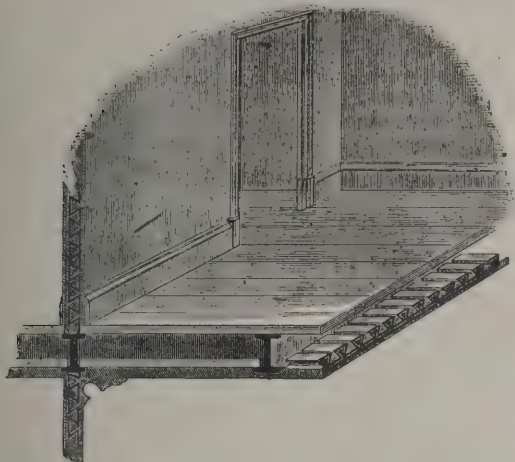
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HIGH-CLASS WINDOW BLINDS, CORNICE POLES, &c. For Clubs, Mansions, Hotels, &c.

Architects, Builders, and the Trade generally are invited to inspect the Exhibit at the Building Exhibition, Stand No. 19.

CHARLES DAVIS,
40 CASTLE STREET EAST, OXFORD STREET, W.
Established nearly a Century.

firm actually erected a building exemplifying their own system in the course of a few hours, and thus proved the value of one of their claims to a saving of time by its adoption. We will just give a short description of this patent system of building fireproof floors and partition walls, the advantages of which are real and practical. The main principle may be said to consist of the application of patent corrugated iron sheets, laths and circular laths, which together produce a complete building. The sheets are not made in the usual undulated form, but are made so that each corrugation forms a separate dovetailed channel. It will at once be seen that, when corrugated in this manner, the sheets possess very great power of sustaining any weight laid upon them, at the same time forming a perfect key for plastic material of any nature. The illustration below will convey an idea of this. The system of building is simply this:—



The outside walls of the house are built varying in thickness according to the height of the building, &c. When the first floor is reached the joists are built in 3 feet apart and the iron sheets laid between with the ends of the corrugations resting on the bottom flange of the joists. A channel is left all round the wall about $1\frac{1}{2}$ inch to receive the ends or sides of the sheet and concrete, and so the whole is firmly keyed to the outer walls. For a 12-feet span 4 by 3 inch steel joists, placed 3 feet

apart, with the sheets laid between and filled up with concrete, form a floor 6 inches over all strong enough to bear a load of $1\frac{1}{2}$ cwt. per foot super, exclusive of its own weight. It will thus be seen that a saving is effected of one course of bricks 3 inches all round the building. Particularly is this economy of space effected by this system of partition walls, which gives a wall 2 inches thick when finished equal in strength and durability to a 9-inch brick wall. The saving of space is thus very considerable. These advantages are all illustrated in the exhibit, which is certainly a difficult test, and it is shown how columns, doorways, &c., are arranged. The London County Council have, we notice, adopted it, and we hope it will meet with the success it deserves.

C. Batchelar.

Mr. Charles Batchelar, of Holloway Road, N., has a large variety of barrows, ladders, &c., in use by contractors and builders. A specialty is made of a device called a "cripple," a substitute for scaffolding in small work, which is fixed on to the sides of the ladder. Mr. Batchelar is a very large maker of all these requisites, and claims to do only substantial, strong work at the lowest possible rates; and situated near Holloway Station, G.N.R., there is every facility for quickly despatching to all parts.

P. Bastendorff & Co.

Messrs. P. Bastendorff & Co., of 4 Euston Square, N.W., are well represented at Stand No. 91 by every description of bamboo furniture. This firm occupy the premier position in this specialty, and their exhibit does them justice. We intend in a subsequent issue, to notice an architectural feature of the firm's business, viz. bamboo bungalows.

Christopher Anker.

A detailed and illustrated description appeared in *The Architect* for July 8, 1892, of the works and marbles of Mr. Christopher Anker, of Fredrikshald, Norway. A representative collection of Norwegian marbles is on view at the Exhibition, of marble slabs in all varieties, and of marble work as worked for table-tops, mouldings, &c. The collection is evidently meant to be representative rather than a selection of choicest specimens picked out for peculiar excellence as exhibition gems. The variety is large, samples being shown of Brèche Rose Vif, Jaune Rose Royal, Brèche Petit Melanche, Blanc Veiné, Brèche Violacée, Bleu Tigre. Many of

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Estimates given, and Architects' own designs and work carefully executed.

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"COMPACT" FIRE HYDRANTS.

AS USED AT THE HOTEL METROPOLE (LONDON AND BRIGHTON), ALBERT PALACE, &c.

The "COMPACT" has following advantages:—

- 1.—It is a perfect Hydrant without packing.
- 2.—It takes up least possible space.
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- 4.—It is all gunmetal, and can be had with screwed or instantaneous outlet, and screwed flanged inlet.

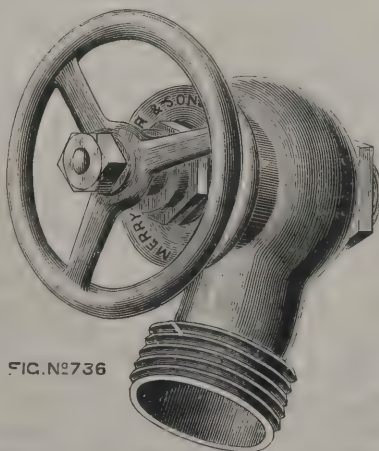


FIG. N°2736

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PHILLIPS' PATENT LOCK-JAW



MAKE THE BEST AND CHEAPEST ROOF OF THE DAY.

For full descriptive Catalogue, address the Patentee—

CHARLES D. PHILLIPS,
NEWPORT, MON.

these show curiously erratic colouring and markings that cannot fail to attract attention. Melanche Rubane, Citron, a beautiful and equally distributed colour throughout, Blanc Veiné, Vert Rose, Gloire Fauske (mainly red, with white and buff interlaced), Vert Canrobert, statuary distinguished by purity of white, antique Ruban, a grey and white. Very large polished marble slabs are also shown, black finely veined with white and white veined with black, and other choice variegated marbles.

Next week notices of other exhibits will appear, and among them of the exhibits of T. Freeman; E.C. Braby & Co.; Dove's Sanitary Company, Limited; Ellis, Partridge & Co.; Marsden Tile Company; Bedford, Lemere & Co., &c.

THE "PREMIER" HAND-POWER MORTICING MACHINE.

IN designing this machine, which is just being put in the market, the aim has been to produce a machine with few parts and complete as possible. The power applied to the machine handle is transmitted direct to the chisel, and has not to pass through a number of joints, pins and levers, as in most other designs; therefore by this construction more useful work can be done by the power applied than by any other. The machine is suitable for working either hard or soft wood, and is therefore useful for cabinet-makers, joiners, wheelwrights, and other workers in wood. The frame is all in one casting, thus giving the machine great rigidity and strength, both of which are not only desirable but absolutely necessary for the execution of good and accurate work. The handle for bringing down the chisel to its work is placed so that the operator stands in an easy and natural position whilst at work. The head may be raised or lowered to suit the various thicknesses of timber. Each machine is complete with boring apparatus, six self-coring chisels, one core driver, spanner, &c. The leading features claimed for the machine are its simplicity, strength, accessibility to all working parts, no joints or pins, large wearing surface, good finish and cheapness.

THE GRINNELL SPRINKLERS.

THE advantages of the Grinnell Sprinklers of Messrs. Dowson, Taylor & Co., Limited, engineers, 14 Queen Victoria Street, E.C., were shown at the fire which occurred last week at the flour mills of Messrs. Marriage, Neave & Co., Limited, Battersea, S.W. The flour mill proper is protected with a very

complete installation of Grinnell Sprinklers. The fire, however, did not in any way injure the mill, and the sprinklers were not, therefore, called into action. The grain warehouse was burned down, and the screen room was damaged slightly by water. Neither of these portions were equipped with sprinklers, but it is the opinion that if sprinklers had been in the warehouse it would be standing now. A fire-pump which Messrs. Dowson, Taylor & Co. put down for the firm, and which is used in connection with the fire hydrant service and the sprinkler installation, did very good service at the fire. It was working nearly all night, and it was from this engine that the first hose jet was brought to bear on the flames.

NATIONAL REGISTRATION OF PLUMBERS.

AT the last meeting of the Registration Committee of the Hull District Council for the National Registration of Plumbers it was resolved that the next examination of the students attending the local plumbing classes should be held at Hull on Tuesday and Wednesday, the 28th and 29th inst. It was also resolved that, subject to a sufficient number of candidates applying, an examination of applicants for registration should be held on April 8, and that the same should be advertised in the local press. It was remitted to the secretary to make the necessary arrangements for the exhibition of the work executed by the students in the plumbing classes.

LIST OF REGISTERED PLUMBERS.

London Journeymen.

GRISLEY, L., 5 Patriot Square, Cambridge Road, E.
SIMPSON, F. A., 92 Augustus Street, Regent's Park, N.W.

Provincial Masters.

ANGLES, F. H., 29 Higher Eanam, Blackburn.
BEAMISH, S. E., 6 Church Street, Nuneaton.
BOULD, E., 5 Union Bank Yard, Huddersfield.
BUBB, J. T., 1 St. James's Parade, Bristol.
CLOSE, W., Bridge Street, Banbridge, near Belfast.
CRAWFORD, J. B., 60 Canal Street, Princess Street, Manchester.
CROSSLEY, T. W., 5 Union Bank Yard, Huddersfield.
DINNING, W., Percy Iron Works, Newcastle-on-Tyne.
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 HESP, A. E., 15 Bold Street, Alexandra Road, Moss Side, Manchester.

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 MILNES, T., 113 High Street, Great Horton, Bradford.
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 STEWART, J., 5 Market Street, Newcastle-on-Tyne.
 UTTLEY, S. H., 145 Pitsmoor Road, Sheffield.
 WALTON, A., 7 Oak Street, Clayton, near Bradford.
 WARD, J. L., 10 Corporation Street, West Bar, Sheffield.
 WATSON, W. J., 98 Royal Avenue, Belfast.
 WEBSTER, F., Brook Lane, Golcar, Huddersfield.
 WILKINS, G., 39 Sun Street, Birmingham.
 WILLIS, W. A., 8 William Street, South Belfast.
 NORTON, J. B., 1 and 2 Old Court House Corner, Calcutta, India.

Provincial Journeymen.

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 HOLBROOK, J. W., 9 Freemantle Place, Stokes Croft, Bristol.
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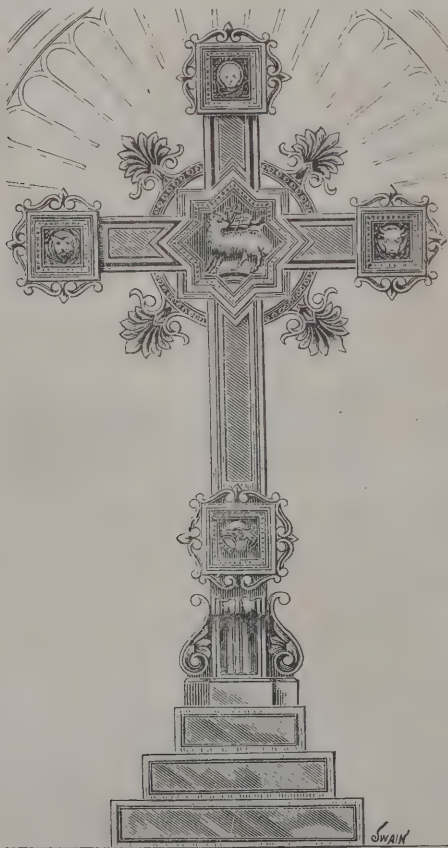
IMPRESSIONS of the BEAUTIFUL ART PLATES which appeared in the New Year's Double Number of "THE ARCHITECT," and in the Number for January 10, 1890, THE MILERS OF THE DEEP. Two Tinted Ink Photographs (size 18½ in. by 13½ in.), may now be obtained, price 1s. each. Free by post, carefully packed in patent roller, 2s. 3d.

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ALTAR CROSS, ST. GEOGRE'S CATHEDRAL, KINGSTON, ONTARIO.

THE Classic altar-cross in polished brass, of which we give an illustration, is about 4 feet 6 inches high, and has been treated to harmonise with the reredos designed by Mr. Frank Darling, architect, of Toronto, and executed by Messrs. Hart, Son,



Peard & Co. The centre plaque is an Agnus Dei in bas-relievo repoussé, with the evangelistic symbols at the four ends, conventionalised so as to be in harmony with the general motif, the panels containing these being deeply recessed and moulded. To avoid the monotony of plain square ends their outline has been broken up by the Etruscan scrollwork, similar to the celebrated bronze cross of Donatelli on the high-altar at Certosa di Pavia, and an emblematic circle surrounds the central panel relieved by honeysuckle detail. The base is a

Calvary, and the junction of the upper part with it is effected by transposed trusswork, the exposed faces of which are delicately moulded. Inscriptions on the base record its presentation to the cathedral in memory of its first Chancellor by his children. The cross will gain much by its position and surroundings when in place, standing in line with a series of columns supporting an entablature, and in an alcove just above the retable.

BUILDING REGULATIONS IN CHICAGO.

A REVISED building ordinance is now before the City Council of Chicago, Ill. The maximum height of buildings is fixed at 160 feet above the sidewalk level. It favours piles for foundations, but does not forbid the use of steel or iron rails. All buildings devoted to the sale, storage or manufacture of merchandise, and all stables which are 100 feet or more high, must be entirely of fireproof construction. Buildings of less than 100 feet and more than 60 feet high must be entirely of slow-burning or mill construction; buildings of less than 60 feet in height may be of ordinary construction. In Class 2, buildings used as residences for three or more families, hotels, boarding or lodging houses, &c, occupied by twenty-five or more persons, and all office buildings which are 90 feet or more high, must be entirely of fireproof construction. If less than 90 feet and more than 60 feet, their construction must be slow-burning or mill construction. If they are less than 60 feet in height their construction may be of the ordinary sort. Class 3, all buildings used as residences for one or two families, or for less than twenty-five persons, may be built of ordinary construction, except if they are 60 feet or more high, they must conform to the limitations fixed for buildings of Class 2. In Class 4, all buildings used as assembly halls for large gatherings, whether for purposes of worship, instruction, or entertainment, must be safely constructed under rigid rules. Height of buildings of non-fireproof construction is estimated from the sidewalk level to the highest point of the roof.

CONSTRUCTION OF MANUFACTURING BUILDINGS.

AT the meeting of the Gloucestershire Engineering Society, Mr. Robert Phillips, county surveyor, read a paper entitled "Notes on the Construction of Buildings for Manufacturing Purposes." He said, given a sufficiently extensive site, buildings on all the ground floors are best, but it often happened several floors were required. When surveying the plot one of the first things to settle was the level of the ground floor. If there is a public road near, level off the centre of the road, and keep the principal entrance so that you can easily get in at it, remembering that the road will gradually rise. Westgate Street is some 8 feet above the old Roman level. Drive a peg down, and take a reading with the dumpy level off some fixed point, then set out the leading lines, and twist the plan about till you can get a north light where you want your best lights. Before a trade building can be planned properly its special business must be studied. Well-designed engineering shops are begun with the foundry and boiler-shop, the erecting and finishing shops coming last. Ascertain if the business requires machines driven from below or by overhead belts, and see if drainage for the basement is possible. Subways should be high and well-lighted, or the bearings and shaftings will be neglected. Where part of the work is outdoor, requiring a yard, the L-shaped plan is the best, with the foreman's office in the angle, with windows looking into the yard and into each shop. If there is more than one floor there should be staircases inside the offices, giving access to each floor, and lifts at the angle of the L, or at the end of each arm. In all large works the prime cost is the most important, and this starts with the timekeeper, who should be the assistant or the prime-cost clerk, and their offices should adjoin. If the motive power is steam the boiler-house should be so placed that coals can be tipped direct on to the shovel-plates. Where the processes have to be kept secret and visitors are not allowed there must be a waiting-room at the entrance, and it is well for this to be near the general office and all workmen to pass through this under the eye of the clerks. There should be one entrance for every 150 men. With 500 men with metal tickets to check in and out at one entrance he found nearly an hour a day was lost, partly by the men and partly by the master. By making three entrances and changing the form of the metal ticket to a ring, and placing rods handy for the men to drop their tickets on as they walked through, the time was reduced to ten minutes. In most factories the shafting is run too slow. If the business requires the moving about of heavy weights fixed cranes or overhead travellers will be required, and it will be necessary to prepare for these in the foundations. Details were given by Mr. Phillips as to setting out buildings and laying in thoroughly good foundations, the importance of which he insisted upon to prevent future shrinking and sinking. Wherever the ground-floor is of brick, stone or tiles, the damp

course must be above the floor. Wherever it is of wood it must be below, and if on the ground-joists it must be below the plate and air-bricks be provided for ventilation. Sawn slate with tongued joints and stoneware are the best, and felt and tarred paper the worst. A pitch-and-tar damp course, fairly reliable, can be made of 1 pail of pitch, $2\frac{1}{2}$ of tar and 8 of sand, well boiled together. Details as to building the brickwork were given, and several valuable practical hints were also given. Firebricks as lining to furnaces should be laid in half brickwork. In regard to mortar, he said there should be good lime one part, and good sand or ashes three parts, with clean water mixed on a hard floor, and a little foundry sand will make it equal to some cements. He next described the best methods of constructing floors, noticing the different kinds in use. Coming to roofs, he showed how the different kinds were best made and the best materials to cover them with. He could say little for galvanised iron roofs, as he had found a large one cost more for repairs than the first cost of any other kind of roof. Details followed regarding doorways, windows, lighting and warming appliances. Mr. Phillips urged that steam was preferable to hot water for warming purposes.

EMPLOYERS AND WORKMEN.

At the last meeting of the Manchester Association of Engineers, Mr. T. Daniels, president of the Association, in the chair, there was a large attendance of members. A paper on "The Relations between Employers and Workmen in Engineering Works" was read. Mr. C. R. Iorns said the question of the conditions of labour—in other words, the relations between employers and workmen—had become so strained and acute that some forty years ago it crystallised itself into what was called the "Condition of England Question." Since then these relations had greatly improved, notwithstanding certain ugly facts, as, for instance, the prolonged dispute between the Lancashire cotton spinners and their workpeople, which, apart from all the loss and suffering the dispute entailed, was marked by an absence of bitterness and acrimony on both sides, and by a forbearance founded upon an enlightened intelligence, which had never been so conspicuous in a labour dispute before. This conflict and many others in recent years showed that the masters had come to regard their workpeople as something more than mere machines, and that the work-

people were disposed to act more like men and less like machines. A great improvement had therefore taken place between masters and men, and it was significant that to the satisfactory solution of the capital and labour problem the best thought of this and other countries had been given for many years past, and numerous experiments had been tried, some of them at great cost, with a view to hasten this solution. To enable the faculties of a man—mental and moral as well as physical—to attain their full development, it was now contended that shorter hours of labour were necessary. An interesting experiment of what was known as "The forty-eight hours' week" was being tried by a Manchester firm of engineers, Messrs. Mather & Platt. Whether all that was expected from this experiment would be realised was very doubtful; but, whatever the result might be, the experiment would be watched with the greatest interest by all large employers of labour, and should the expectations of those who had faith in it be approximately realised it would give an impetus to the demand for shorter hours that it would be difficult to resist. As things now stood many of the employed seemed to think that all they had to do was to get inside the gates of the works a certain number of times per week to entitle them to draw their wages at the week end, utterly ignoring the common-sense principle that the employer was entitled to their full services during working hours. All present must be aware of the general dilatoriness displayed by the men in getting to their benches or machines after the bell had been rung. As a rule fully five minutes were lost at each starting-time before the work was commenced, and this entailed a serious loss to the employer. Take the case of a firm employing 500 hands, with three starting-times a day. The total time per day would be 125 hours, making a loss equal to the rental of a works employing this number of hands. Another feature was the ingenious manner in which the men in all branches "nursed" their work when they supposed orders were scarce, and how, when orders were plentiful, they seized upon the most trivial points to harass the concern. It was a matter for regret that, owing to the want of thought arising from defective or little education, the workmen were now so easily led astray by the plausible phrases of the professional agitator. To insure industrial peace and prosperity it was essential that our workpeople should be educated to the fullest possible extent, and then they would more and more recognise how identical their interests were with those of their employer, and be more influenced by that spirit of equity and justice expressed in the motto, "A fair day's work for a fair

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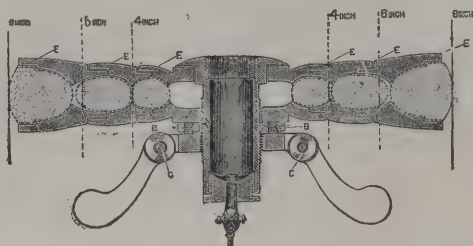
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day's wages." The closer the relationship between employers and employed could be drawn and the more fully the interests of each could be made identical, the nearer we should be to a state of industrial peace and prosperity.

NOTES ON NOVELTIES.

Improvement in Drain-testing Plugs.—We have pleasure in noticing the ingenious invention for drain-testing lately protected by Messrs. Price, of 139 Albert Street, N.W. It consists of a number of rings, each so fitted to the other that it is capable of testing a 4, 5, 6, or 9-inch drain, the whole thing when together being so compact that it takes up only the same



space as one of the ordinary pattern; the weight again is about one-third of the usual patterns. We give the above small illustration, as we cannot but acknowledge the great advantage gained by surveyors, builders, &c., whose duty it is to carry these things for the purpose of testing drains. The price, we understand, is less than the ordinary patterns.

VARIETIES.

AN inscription of the Emperor Cæsar Marcus Aurelius Severus (Alexander), who reigned from A.D. 222 to A.D. 235, has been found at South Shields within the site of the Roman station during the excavations for the erection of a Board school.

TRADE NOTES.

THE new Workhouse Infirmary, Lichfield, which is nearing completion, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues, supplied by Mr. E. H. Shorland, Manchester.

WE are informed by Mr. James Brown, brick merchant, that he has removed his office from 103 Cannon Street, E.C., to his dépôt, Essex Wharf, Durward Street (opposite London Hospital), Whitechapel, E.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

4259. Thomas Potter, for "Improvements in the construction of fire-resisting floors."

4266. James Arthur Allen, for "A circular spring padlock."

4300. Walter Bennett, for "Improved means for preventing smoky chimneys."

4401. Francis Fitzadelm Persse, for "A new or improved draught preventer for doors, windows and the like."

4404. George Downing, jun., and Thomas Ryan, for "An improved firegrate."

4413. John Henry Davis and Richard John Kinkead, for "Improvements in draught excluders."

4440. Edward Drew, for "Improvements in or applicable to windows, fanlights and ventilators, for opening and closing, adjusting and fastening the same."

4459. Goy Peachy, for "New or improved dust-flue for domestic fireplace."

4489. Emil Carl Christian Krogh, for "Improvements in and relating to electric fire alarms."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

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See BUILDERS' EXHIBITION,

STAND No. 26.

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THE Architect and Contract Reporter.

NOTICE.

Next Friday being Good Friday, THE ARCHITECT will be published on Thursday. All Advertisements intended for this Number must reach the Office not later than 3 p.m. on Wednesday, March 29.

COMPETITION OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200*l.*, 150*l.* and 100*l.* Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

ABERAMAN.—March 27.—For Building Twenty Semi-detached Villas. Mr. G. A. Trehearne, Architect, 7A Cardiff Street, Aberdare.

ABERDARE.—March 25.—For Building Intermediate Schools. Mr. John H. Phillips, St. John's Chambers, Cardiff.

ABERDARE.—March 31.—For Building Twenty Dwelling-houses. Mr. C. H. Elford, Architect, 34 Canon Street, Aberdare.

ALTRINCHAM.—March 27.—For Additions to Literary Institute for Free Library, &c. Mr. F. Popplewell, Architect, 87 Mosley Street, Manchester.

BANGOR.—March 24.—For Building Infectious Diseases Hospital. Mr. John Gill, Bangor.

BANGOR.—March 25.—For Building Cottage Residence. Mr. Robert Grierson, Architect, Bangor.

BARDNEY.—March 25.—For Works for Bridge over the Witham, Brickwork Approaches, Steel Lattice Girders and Flooring. Mr. J. Thropp, County Surveyor, 29 Broadgate, Lincoln.

BARNET.—March 31.—For Building Four Small Houses. Mr. Byfield, Solicitor, Barnet.

BELFAST.—April 6.—For Erection of Sheds and other Structures for Agricultural Show. Mr. John Boyd, 117 Victoria Street, Belfast.

BLAENAVON.—April 1.—For Building Master's House. Mr. E. A. Lansdowne, Architect, Newport, Mon.

BOLTON.—For Erection of Circus Building. Mr. Frank Matcham, Architect, 9 Warwick Court, London, W.C.

BRADFORD.—March 30.—For Building Harness Room, Cart Shed, &c. The Borough Surveyor.

BRADFORD.—March 25.—For Building Groundsman's House for the Athletic Club. Messrs. E. & S. Critchley, Architects, 27 Kirkgate, Bradford.

BRADFORD MOOR.—March 27.—For Building Two Houses. Messrs. Empsall & Clarkson, Architects, Tyrril Chambers, Bradford.

BRAINTREE.—March 31.—For Building Cottage at Waterworks. Mr. J. H. Jevons, Surveyor, Waterworks Office, Braintree.

BRAINTREE.—March 31.—For Providing and Fixing Air Vessel and other Work. Mr. J. H. Jevons, Surveyor's Office, Waterworks, Braintree.

BRISTOL.—April 6.—For Building the Caxton Works. Mr. Henry Williams, Architect, 28 Clare Street, Bristol.

BRISTOL.—April 7.—For Building Recreation Room, Extension of Dormitory and other Works at Diocesan Training College, Fishponds. Mr. Wm. L. Bernard, Architect, 3 St. Stephen's Chambers, Baldwin Street, Bristol.

BRITON FERRY.—March 28.—For Building Board Schools. Mr. H. F. Clarke, Architect, Briton Ferry.

BURSLEM.—March 27.—For Works for Public Park, Walling and Entrances, Lodge, &c. Mr. F. Bettany, Borough Surveyor, St. John's Chambers, Queen Street, Burslem.

CAERPHILLY.—March 25.—For Building Schoolroom and Master's House. Mr. Thomas Rowland, Architect, Market Buildings, Pontypridd.

CAMBORNE.—March 30.—For Pulling Down and Rebuilding Board Schools, Basset Road. Mr. J. Hicks, Architect, Redruth.

CARDIFF.—March 25.—For Building Two Semi-detached Villas. Messrs. Bruton & Williams, Architects, Cardiff.

CARDIFF.—March 25.—For Building School, Boundary Walls and Outbuildings. Mr. E. M. Bruce Vaughan, Architect, Cardiff.

CARDIFF.—March 28.—For Building Chimney-shaft, 150 feet high, at Electric Lighting Station, Canton. Mr. W. Harpur, Engineer, Cardiff.

CARLISLE.—March 27.—For Alterations to Caledonian Hotel. Mr. George Armstrong, Architect, 45 Lowther Street, Carlisle.

CASTLETON.—For Building Conservative Club. Mr. A. Meadon, Prospect Terrace, Castleton, near Rochdale.

CATFORD.—March 30.—For Building Twenty-three Houses. Messrs. F. & W. Stocker, 90 Queen Street, Cheapside, E.C.

CATFORD.—March 30.—For Building Twenty-three Houses. Messrs. F. & W. Stocker, Surveyors, 90 Queen Street, Cheapside, E.C.

CHAPEL ALLERTON.—March 27.—For Building Ten Houses, Newton Park. Messrs. Smith & Tweedale, Architects, 12 South Parade, Leeds.

CHERTSEY.—April 12.—For Construction of Sewerage and Sewage Disposal Works for Weybridge and Oatlands. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

CHURCH STRETTON.—March 29.—For Construction of Small Reservoir, Filter, Clear Water Tank, &c. Mr. S. Darlington, Secretary to the Water Company, Church Stretton.

CLEATOR MOOR.—April 1.—For Converting Cottages into Shops. Mr. M. W. Coulthard, 52 High Street, Cleator Moor.

CORK.—March 30.—For Additions, &c., to 73 Patrick Street. Mr. R. Walker, Architect, 17 South Mall, Cork.

CO. WICKLOW.—April 3.—For Building House for Resident Priest, Greystones. Mr. P. F. Comber, C.E., 8 Anglesea Street, College Green, Dublin.

DEWSBURY.—March 24.—For Building Branch Stores, Reading Rooms and Six Houses. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

DOVER.—March 25.—For Building Infants' Schools. Mr. Edward W. Fry, Architect, St. Martin's House, Dover.

DUNDEE.—March 27.—For Building Board School. Mr. James H. Langlands, 81 Murraygate, Dundee.

DURVESTON.—For Building Schools, for Viscount Portman. Mr. C. Hunt, Architect, Blandford.

FEATHERSTONE.—March 25.—For Building Hotel and Stables. Mr. J. Holmes Greaves, Architect, 38 Albion Street, Leeds.

FULHAM.—April 5.—For Building Diphtheria Wards at Western Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

GREAT CORBY.—March 30.—For Building House. Mr. J. Milburn, Wentworth Place, Hexham.

HADFIELD.—April 4.—For Taking Down and Rebuilding Shops. The Secretary, Equitable Co-operative Society, Limited, Hadfield.

HASTINGS.—April 10.—For Building Technical School, Manor Road. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

HOOLEY HILL.—March 29.—For Building Villa and Two Houses. Messrs. T. George & Son, Architects, Old Square, Ashton-under-Lyne.

HOVE.—March 28.—For Construction of Sea Wall, Groynes, Esplanades, &c. The Town Surveyor, Town Hall, Hove, Sussex.

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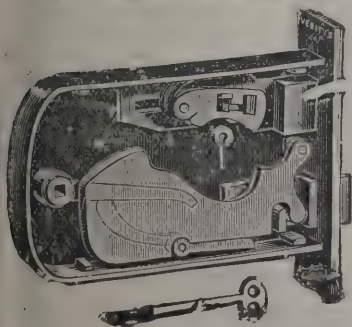
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ILKLEY.—For Building Residence. Messrs. Isitt & Adkin, Architects, Queen Anne Chambers, Bradford.

KINGSTON.—March 24.—For Masonry Storehouse and Timber Forch at Lighthouse. Mr. Owen Armstrong, Secretary, Irish Lights Office, Dublin.

KINGSLEY.—March 25.—For Building Small Mission Church. The Rector, Kingsley, Stoke-on-Trent.

LEEDS.—March 27.—For Pulling Down and Rebuilding Premises, Guildford Street, and Alterations to Commercial Hotel, Albion Street. Mr. T. Winn, Architect, 5 Park Lane, Leeds.

LIVERPOOL.—April 5.—For Erection of Mortuary Buildings and Alterations to Local Board Offices, Toxteth Park. Mr. J. Price, Engineer, Local Board Offices, Lark Lane, Toxteth Park, Liverpool.

LLANDAFF.—March 24.—For Building Infant Schools. Messrs. Halliday & Anderson, Architects, 19 Duke Street, Cardiff.

LLANBRADACH.—March 31.—For Building Hotel. Mr. John Williams, Architect, Morgan Town, Merthyr Tydfil.

LLANDOVERY.—April 3.—For Repairs to Town Hall. Mr. Daniel Phillips, County Surveyor, Carmarthen.

LONDON.—For Building Warehouse, Cursitor Street. Messrs. Satchell & Edwards, Architects, 37 Norfolk Street, Strand.

MANCHESTER.—March 29.—For Extensions at Abattoirs. Mr. J. Allison, City Surveyor, Town Hall, Manchester.

MANCHESTER.—March 29.—For Building Chill Rooms, Cold Stores, &c., by Abattoirs. Mr. M. C. Bannister, Engineer, 29 Princess Street, Manchester.

MANCHESTER.—April 7.—For Construction of Gasholder Tank, Bradford Road Works. Mr. C. Nickson, Superintendent, Gas Department, Town Hall, Manchester.

MANSFIELD.—For Building Technical Schools. Messrs. Evans & Jolly, Architects, Eldon Chambers, Wheeler Gate, Nottingham.

MIDLEY.—April 1.—For Building Timber Store, Barn, Stable, Mistal, Cart Shed and Three Through Houses. Mr. T. Lister Patchett, Architect, George Street Chambers, Halifax.

NAVIGATION.—March 31.—For Building Three Shops. Mr. Arthur O. Evans, Architect, Pontypridd.

NEATH.—March 29.—For Reroofing Church. The Churchwardens, 9 Wind Street, Neath.

NEWBURY.—April 3.—For Building Retort House and Coal Store. Mr. Robert M. Couper, Engineer, Gasworks, Newbury.

NEWCASTLE.—For Rebuilding Sheds, Wool Store and Stables, for Messrs. Wilson & Waggott. Mr. Arthur Stockwell, Architect, 11 Pilgrim Street, Newcastle-on-Tyne.

NEW SWINDON.—For Building Warehouse and Workshop. Messrs. Bishop & Pritchett, Architects, Regent Circus, Swindon.

NEW WORTLEY.—March 29.—For Building Workshops, Stables, &c., at Gasworks. Mr. Robert Smith, Resident Engineer, Gasworks, New Wortley, Leeds.

NORTH SHIELDS.—March 24.—For Construction of Stone Bridge over Seaton Burn, with Approaches, &c. Mr. A. S. Dinning, Engineer, 25 Ellison Place, Newcastle-on-Tyne.

PANDY.—March 29.—For Renovation of Baptist Chapel. Mr. H. Newman, New Cottages, Old Castle, Pandy, Wales.

PEMBERTON.—For Building Six Cottages. Mr. R. Fleming, 31 King Street, Wigan.

PETERBOROUGH.—March 31.—For Additions to Corn Exchange. Mr. H. M. Townsend, Architect, Cross Street, Peterborough.

PWLLGWAWN.—March 31.—For Building Infants' School with Outbuildings, Boundary Walls, &c. Mr. J. J. Evans, C.E., Penarth.

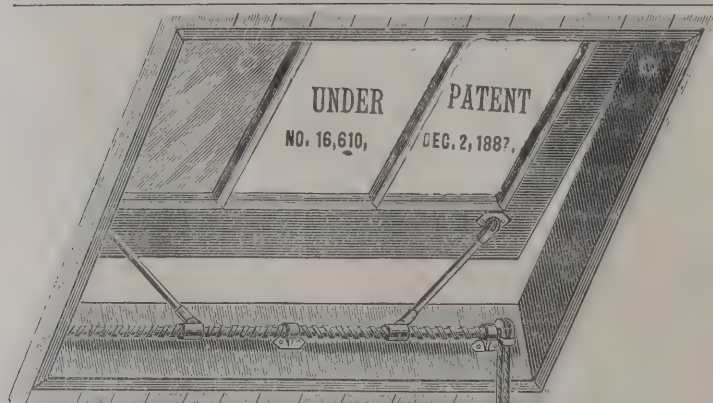
QUEENBOROUGH.—April 5.—For Laying Water Main Supply of Material, Hydrants, Sluice Valves, Connections Stopcocks, Covers, Casings, &c. Mr. W. J. Harris, Town Clerk, 76 High Street, Sittingbourne.

RHOSDDU.—March 25.—For Building Board School for Infants. Messrs. Lash & Gant, Architects, 5 Temple Row, Wrexham.

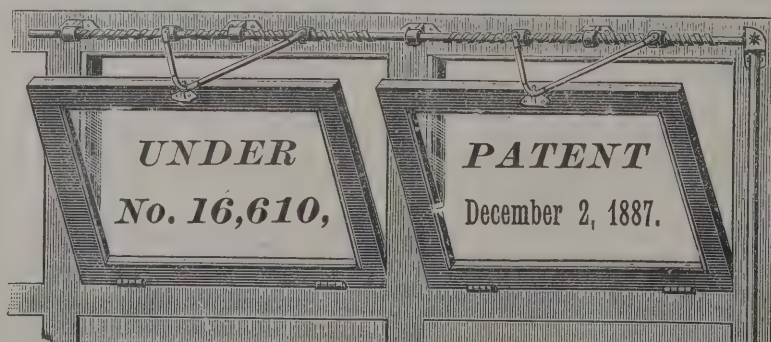
ROSSENDALE.—March 28.—For Building Board Schools, Waterfoot. Mr. Thomas Bell, Architect, Grimshawe Street, Burnley.

RUAN MAJOR.—April 1.—For Erection of Farm Buildings. Mr. G. Gow, Tregothnan Office, Truro.

SALISBURY.—March 28.—For Building Engine House, Boiler House and Coal Store at Waterworks. Mr. J. C. Bothams, City Surveyor, Municipal Offices, Salisbury.



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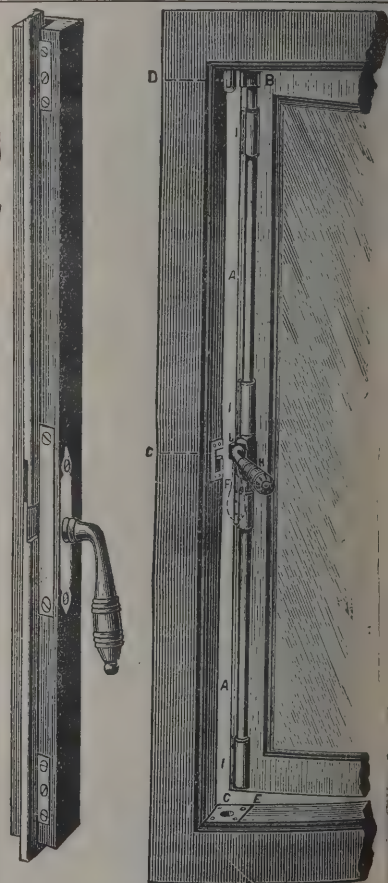
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SELBY.—April 4.—For Additions, &c, to Burn Hall, Top House, Paper House, Haddesley Lodge, Farm Premises and Cottages. Mr. J. S. Ullathorne, Architect, Millgate, Selby.

SOUTHEND.—March 30.—For New Guard-room at Police Station. Mr. H. Gibson, Clerk of the Peace, Chelmsford.

SOUTH SHIELDS.—March 27.—For Building Wing to Workhouse Infirmary, Harton. Mr. J. H. Morton, Architect, South Shields.

SOEWBY.—April 3.—For Additions to St. Oswald's National Schools. Mr. T. Stokes, Architect, Thirsk.

STAFFORD.—For Erection of County Council Buildings. Mr. H. T. Hare, Architect, 1 York Buildings, Adelphi, W.C.

STORNOWAY.—March 30.—For Building English Congregational Assembly Hall. Mr. John Robertson, Architect, Inverness.

STROUD.—March 30.—For Restoring Parish Church at Randwick. Messrs. Waller & Son, Architects, 17 College Green, Gloucester.

ST. GWINEAR.—March 30.—For Building Schoolroom, &c. Plans, &c., at the Vicarage, St. Gwinear, Cornwall.

TAVISTOCK.—March 25.—For Building Grammar Schools. Mr. J. D. Johnstone, Solicitor, 1 Church Lane, Tavistock.

THAKEHAM.—March 27.—For Additions to Workhouse. Messrs. Scott & Cawthorne, Architects, Brighton.

TIPTON.—April 6.—For Alteration and Enlargement of Board Schools. Mr. Alfred Long, Architect, 319 High Street, West Bromwich.

THE LIZARD.—March 28.—For Building First-class Hotel and Boarding House. Mr. Alfred H. Jenkin, Solicitor, 1 Alma Place, Redruth.

THORPE, YORKS.—March 27.—For Building Two Semi-detached Villas. Mr. Robert Lennard, Architect, Cliff Street, Whitby.

WESTON-SUPER-MARE.—March 25.—For Building House. Mr. S. J. Wilde, Architect, Boulevard Chambers, Weston-super-Mare.

WIDNES.—March 28.—For Building Technical Schools and Free Library. Messrs. Woodhouse & Willoughby, Architects, King Street, Manchester.

WORTHALLERTON.—March 30.—For Restoring Linoleum Factory, for the Tarpaulin, Brattice Cloth and Linoleum Co., Limited. Mr. H. Walker, Architect, West Cliff Saloon, Whitby.

TENDERS.

ACCRINGTON.

For Building Primitive Methodist School Chapel, Accrington. Messrs. HAYWOOD & HARRISON, Architects, Accrington.

Accepted Tenders.

F. T. Stanley, mason	£1,141	7	0
Industrial Society, carpenter	620	0	0
Robinson, plumber	170	0	0
Evans & Co., slater	81	2	0
Eastwood & Douthwaite, plasterer	78	15	0
Robinson, painting	39	0	0

BELFAST.

For the Construction and Erection of a Timber Wharf and Collateral Works on the West Side of Queen's Island, Co. Down, for the Belfast Harbour Commissioners.

W. J. Dougherty, Dublin	£12,208	0	0
Stevenson, Belfast	10,959	0	0
Fitzpatrick Bros., Limited, Belfast	10,573	0	0
H. & J. Martin, Limited, Belfast	10,268	0	0
Executors of W. Gradwell, Barrow	9,763	0	0
J. Jourdan, Belfast	9,350	0	0
Workman & Co., Belfast	8,950	0	0
J. Henry, Belfast	8,249	0	0

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S. J. Jerrard	£5,757	0	0
Lawrance & Sons	5,548	0	0
T. H. Kinglerlee	5,472	0	0
H. Stevens & Sons	5,300	0	0
H. T. SANDERS (accepted)	5,277	0	0

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H. Wall	£375	0	0
W. H. Lascelles	318	0	0
W. TUFFEE, Gravesend (accepted)	156	0	0

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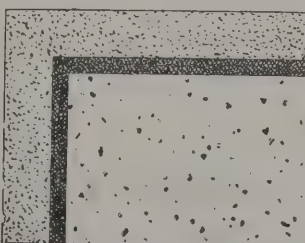
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Parnell & Son, Rugby	6,300	0	0
W. TINDALL, Cambridge (accepted)	6,183	13	0

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Burn & Baillie, Newcastle Street	1,048	0	0
R. P. Beattie, Victoria Street	667	0	0
F. Franklin, Chelsea	656	0	0
C. Lewis, Witham	625	0	0
C. Christie, Aldgate	622	0	0
M. Batchelor, Maidstone	620	18	0
Vigor & Co., Southampton Row	590	10	0
Humpherson & Co., Fulham Road	580	0	0
J. B. McFarlane, Parson's Green	576	0	0
F. Islip, Clapton	570	0	0
E. Proctor, Woolwich	530	0	0
W. Akers & Co., South Norwood	530	0	0
H. Conolly, Hampstead Road	520	0	0
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D. C. Jones, Gloucester	£1,992	0	0
A. Berridge, Cardiff	1,933	0	0
D. D. Williams, Knighton	1,745	0	0
W. Evans, Carmarthen	1,700	0	0
Thomas Brothers, Llandilo	1,681	0	0

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For Building Vicarage at Rhandirmwyn, near Llandovery. Mr. DAVID JENKINS, A.R.I.B.A., Architect. Quantities by Architect.

D. C. Jones, Gloucester	£2,377	0	0
J. D. Williams, Knighton	1,965	0	0
Price & Jenkins, Knucklus	1,772	0	0

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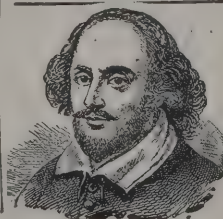
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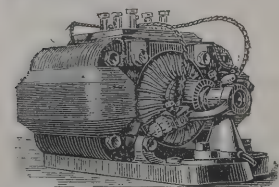
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Croggon & Co., Limited	1,377	10	0
W. Harbrow	1,355	0	0

For Erecting a New Chimney Shaft in Connection with Heating Apparatus to the entire height of the Building, at Board School, Matthias Road, Stoke Newington.

Kirby & Chase	£175	0	0
H. Knight & Son	122	10	0
F. Britton	110	0	0
W. Neil	110	0	0

For Cleaning, Painting and other Work at the Northern Hospital, for the Metropolitan Asylums Board. Messrs. PENNINGTON & BRIDGEN, Architects.

Vigor & Co., Poplar	£5,022	5	7
T. Taylor & Son, Holloway	4,537	0	0
H. G. Davenall, Gospel Oak	4,296	0	0
T. W. Smith & Son, Essex Road	4,051	10	4
W. & E. Mills, Westcombe Park	3,994	0	0
G. A. H. Wall & Co., Kentish Town	3,797	0	0
E. Proctor, Woolwich	3,619	0	0
MARK BATCHELOR, Maidstone (accepted)	3,441	10	0
Architect's approximate estimate	3,050	0	0

For Building Board School, Enfield Road, Hackney, to Provide Accommodation for 1,178 Children. Mr. T. J. BAILEY, Architect.

	Extra if Brickwork in Cement.	Less if One Hall be omitted
J. Longley & Co	£494	£250
Hart Bros.	350	175
Killby & Gayford	288	235
D. Charteris	371	250
G. S. S. Williams & Son	384	—
Colls & Son	410	250
J. Grover	215	180
C. Cox	371	259
E. Lawrance & Sons	371	226

LONDON—continued.

For Building Cookery Centre in connection with Board School, Raywood Street, Battersea. Mr. T. J. BAILEY, Architect.

B. E. Nightingale	£864	0	0	£27	0	0
J. Shillitoe & Sons	820	0	0	20	0	0
J. Smith & Sons	758	0	0	18	0	0
J. Willmott & Sons	739	0	0	25	0	0
Treasure & Son	36	0	0	25	0	0
F. J. Coxhead	703	0	0	16	0	0
J. Marsland	695	0	0	21	0	0
Lathey Bros.	689	0	0	21	0	0
Hart Bros.	689	0	0	18	0	0
Holloway Bros.	671	0	0	17	0	0
J. Tyerman	647	0	0	22	0	0
Holliday & Greenwood	577	0	0	18	0	0

The tenders include carrying out various works to existing buildings.

For Building Mortuary, Coroner's Court and other Buildings for the Vestry of St. Margaret and St. John, Westminster. Mr. G. R. W. WHEELER, Assoc. M. Inst. C.E., Architect. Quantities by Mr. W. H. HEWISH, 66 Victoria Street.

T. L. Green	Informal
Williams & Richards	£6,650 0 0
J. Smith & Sons	6,487 0 0
John H. Neave	6,449 0 0
Hoskins & Wiltshire	6,405 0 0
Holloway Bros.	6,387 0 0
F. G. Minter	Informal
Holliday & Greenwood	6,222 0 0
D. Charteris	Informal
A. Brickell	6,190 0 0
T. W. Haylock	Informal
J. Mowlem & Co.	6,145 0 0
W. H. Lorden & Sons	6,085 0 0
W. Wallis	5,947 0 0
N. Lidstone	5,860 0 0
J. Allen & Sons	5,750 0 0
J. O. Richardson	5,738 0 0

We hear that some papers have reported that Mr. Richardson's tender was accepted, whereas the Vestry only decided the matter on Wednesday, by accepting Mr. Lidstone's tender.

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LONDON—continued.

For Building Board School, Mulgrave Place, Greenwich.

		Extra if Brickwork in Cement.
Hart Bros.	£16,012 0 0	£405 0 0
William Downs	15,699 0 0	372 0 0
J. & M. Patrick	15,437 0 0	541 0 0
James Smith & Sons	15,201 0 0	290 0 0
Edward Proctor	15,097 14 10	332 19 3
H. Lidstone	14,474 0 0	312 0 0
Kirk & Randall	14,343 0 0	390 0 0

For Works to Water-closets at Board School, Wilmot Street, Bethnal Green.

M. Calnan & Co.	£1,090 0 0
F. J. Coxhead	1,064 0 0
Staines & Son	1,059 0 0
J. T. Robey	980 0 0
T. White & Son	764 0 0

For Building Board School, Brockley Road, Greenwich, to Provide Accommodation for 800 Children. Mr. T. J. BAILEY, Architect.

		Extra if Brick- work in Cement.
Foster & Dicksee	£16,492 0 0	£281 0 0
J. & M. Patrick	15,186 0 0	350 0 0
D. Charteris	14,563 0 0	350 0 0
Stimpson & Co.	14,320 0 0	280 0 0
Holloway Bros.	14,280 0 0	340 0 0
S. & W. Pattinson	14,156 0 0	220 0 0
C. Cox	13,982 0 0	316 0 0
E. Lawrance & Sons	13,509 0 0	316 0 0
Kirk & Randall	12,987 0 0	316 0 0

For Cleaning, Painting, &c., at South-Eastern Hospital, for the Metropolitan Asylums Board. Mr. T. W. ALDWICKLE, Architect.

G. E. Bryan & Son, South Norwood	£3,097 0 0
W. & H. Castle, Southwark Bridge Road	1,994 0 0
Lilly & Lilly, Limited, Whitcomb Street	1,779 0 0
Jenrick & Crocker, Borough	1,765 0 0
S. White & Son, Bow	1,750 0 0
M. Batchelor, Maidstone	1,744 12 0
E. Proctor, Woolwich	1,380 0 0
T. Gorge & Co., Westbourne Terrace	1,350 0 0
F. C. STOKES & Co, Walworth (accepted)	1,207 0 0

LONDON—continued.

For Enlargement of Board School, Johanna Street, Lower Marsh, Lambeth, by 107 Places, and Erection of House for Schoolkeeper.

		Extra if Brick- work in Cement.
Lathey Bros.	£13,651 0 0	£162 0 0
Hart Bros.	13,615 0 0	156 0 0
B. E. Nightingale	13,412 0 0	204 0 0
W. Downs	13,097 0 0	166 0 0
J. Tyerman	12,934 0 0	192 0 0
J. Marsland	12,605 0 0	155 0 0
S. & W. Pattinson	12,470 0 0	120 0 0
D. Charteris	12,355 0 0	171 0 0
Holliday & Greenwood	11,679 0 0	154 0 0

For Removing Iron Buildings from Faunce Street, Kennington Park Road, to Darrell Road, East Dulwich, for the School Board.

T. Crewys	£644 0 0
D. Charteris	559 0 0
Croggon & Co., Limited	422 10 0
W. Harbrow	419 5 0

LONDON.

For Building Board School for Infants, Adderley Green. Mr. THOMAS P. HULSE, Architect. Quantities by Architect.

N. Bennett, Burslem	£1,891 0 0
P. H. Bennion, Longton	1,779 0 0
H. & R. Inskip, Longton	1,759 0 0
W. Whitfield, Stone	1,675 0 0
H. Goodwin, Longton	1,657 0 0
TOMPKINSON & BETTELLEY, Longton (accepted)	1,597 0 0

MIDDLETON.

For Building Parsonage at Middleton, Westmoreland, for the Rev. Llewelyn Davies. Mr. JOHN F. CURWIN, Architect, Kendal.

B. BRASSINGTON & CORNEY, Settle (accepted)	£1,257 19 0
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NEWHAVEN.

For Building Wesleyan Chapel, Newhaven. Mr. CHARLES BELL, F.R.I.B.A., Architect.

Woolgar, Newhaven	£1,104 0 0
Chapman, Newhaven	1,058 0 0
Hill, Newhaven	1,050 0 0
WILKINSON, Seaford (accepted)	826 10 0



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For Erection of Purifying House and Meter House for the Gas Committee.

W. W. Gladwell, Macclesfield	£2,595	0	0
D. Diggle, Manchester	2,590	0	0
J. Bradburn & Sons, Macclesfield	2,475	0	0
J. Hamilton, Altrincham	2,265	0	0
J. Byron, Bury	2,261	0	0
S. Johnson, Irlam-o'-th'-Heights	2,195	0	0
T. STORER, Denton (<i>accepted</i>)	2,110	0	0
S. Robinson & Sons, Hyde	2,010	0	0

Ironwork, &c.

Whessoe Foundry Co., Darlington	3,815	0	0
Ashmore, Benson, Pease & Co., Stockton . .	3,725	10	0
C. & W. Walker	3,700	0	0
Newton, Chambers & Co., Sheffield	3,612	12	6
W. C. Holmes & Co., Huddersfield	3,598	0	0
Clapham Bros., Keighley	3,522	0	0
R. & J. Dempster, Manchester	3,492	0	0
T. Tattersall & Sons, Elland	3,453	0	0
WESTWOOD & WRIGHTS, Brierley Hill (<i>accepted</i>)	3,297	0	0

PINHOE.

For Building Dwelling-house, Pinhoe, near Exeter, for Mr. Hy. Jeffery. Mr. SAMUEL DEERING, Architect, Tiverton.

W. H. Hicks, Exeter	£527	0	0
N. Pratt, Clyst St. Mary, near Exeter	483	0	0
W. Woodman, Exeter	470	0	0
J. FINNING, Pinhoe, near Exeter (<i>accepted</i>)	450	0	0

SWANSEA.

For Excavations for Messrs. B. Evans & Co.'s New Premises, Castle Street, Messrs. J. P. JONES & ROWLANDS, Architects, 58 Wind Street, Swansea.

D. Jenkins, Swansea	£400	0	0
Holway & Parsons, Swansea	364	5	4
H. Welsh, Hereford	335	0	0
T. Watkins & Sons, Swansea	312	15	2
W. James, Swansea	297	7	9
A. Berridge, Cardiff	295	0	0
T. Waters & Son, Swansea	255	3	5
J. GROVE, St. Thomas (<i>accepted</i>)	250	9	7

SANDHURST.

For Building Police Station. Mr. JOSEPH MORRIS, Architect, 156 Friar Street, Reading. Quantities by Messrs. HENRY COOPER & SONS, 17 Friar Street, Reading.

L. Poffley, Reading	£1,945	10	0
De Vere, Buckingham & Co., Basingstoke . .	1,895	0	0
D'Oyley & Co., Lim., Oxford Street, W. . . .	1,888	0	0
G. Brown, Bracknell	1,833	0	0
William Stokes, Reading	1,811	0	0
William Goodchild, Reading	1,778	0	0
Thomas Martin, Maidenhead	1,740	0	0
George H. Wheeler, Abingdon	1,658	0	0
McCarthy E. Fitt, Reading	1,652	0	0
D. Taylor, Reading	1,626	0	0
John Bottrill & Son, Reading	1,620	0	0
S. East, Zinzan Street	1,593	0	0
Spear & King, Crowthorne	1,568	7	6
J. H. Margetts, Reading	1,558	0	0
A. Binnie, Wokingham	1,550	0	0
John B. Seward, Wokingham	1,538	0	0
J. S. Kimberley, Banbury	1,527	0	0
Alfred Simonds, Reading	1,499	0	0
Solden Hipwell, Wisbech	1,455	0	0
Edwin C. Hughes, Wokingham	1,348	0	0
G. H. Tucker, Reading	1,337	0	0
W. Hawkins, Reading	1,329	0	0
George Smith, High Wycombe	1,234	15	6

SPITTAL.

For Construction of Sea-wall, Spittal, for the Berwick Urban Sanitary Authority. Mr. DICKINSON, Borough Surveyor, Berwick.

J. Ward, Hollinwood	£3,739	2	2
S. Craig, Chirnside	2,699	16	4
R. C. Brebner, Edinburgh	2,323	14	11
S. Hipwell, Wisbech	1,908	7	6
W. Kidd, Middlesbrough	1,891	3	9
J. Carrick, Durham	1,746	2	4
J. Cockburn, jun., Berwick	1,682	0	0
W. S. Kearton, Berwick	1,456	8	8
J. Baird & Son, Edinburgh	1,450	0	0
R. Rule, Coldstream	1,260	0	0
A. G. Brunton, Inverkeithing	1,233	17	11
P. RULE, Tweedmouth (<i>accepted</i>)	1,180	0	0

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PARR & GIBBINGS (<i>accepted</i>)	750	0	0

WOOLWICH.

For Building Soldiers' Institute, Woolwich, for the Trustees of the Association. Messrs. NEWMAN & NEWMAN, Architects, 31, Tooley Street, S.E. Quantities by Mr. W. T. FARTHING, 46 Strand, W.C.

Leslie & Co.	£6,479	0	0
Lascelles & Co.	6,425	0	0
Wall	6,197	0	0
W. Downs	5,900	0	0
Todd	5,844	0	0
Battley, Sons & Holmes	5,687	0	0
Goddard & Sons	5,680	0	0
Coleman	5,490	0	0
Godson & Sons	5,450	0	0
Balaam Bros.	5,300	0	0
Richardson	5,269	0	0
Bullers	5,081	0	0
Cowley & Drake	4,825	0	0

VARIETIES.

SEALED offers for supplying 3,000 barrels of Portland cement for the requirements of the harbour railway at Helsingfors can be sent previous to April 5 to the office of the harbour railway, Helsingfors, where tenders for the contract will be accepted, and where all details will be found.

MESSRS. CHEAL & SONS, of Crawley, Sussex, have won the first premium of 20% offered by the Leeds Corporation for plans for the laying-out of the grounds adjoining Kirkstall Abbey.

WE have received a letter from a competitor who asks permission to call attention to the result of the Hackney Baths

competition. As the writer has not sent us his name, his views as to the result of the competition cannot be published.

TRADE NOTES.

MESSRS. FOSTER & DICKSEE are getting the scaffolding into position for the purpose of building the superstructure of the new Public Record Office, Chancery Lane, E.C. The fireproof floors throughout are to be on the Fawcett system, the same as those now being put up in the new Admiralty buildings.

As an evidence of "taking time by the forelock," we are informed that the proprietor of the Prince's Theatre, Bradford, has ordered from Mr. C. Carr, of Grove Lane, Smethwick, a maiden peal of bells for use in the pantomime of "Dick Whittington," to be produced next Christmas.

MR. GEORGE WRAGGÉ, Wardry Works, Chapel Street, Salford, has just received instructions to supply the whole of the art metal-work for the new staircases, balconies, &c., to be fixed at the Manchester Royal Exchange, and also for the main staircase, balustrades, gates, &c., for the Manchester new Corn Exchange. Mr. Wragge has removed his London office and show-rooms from Surrey Street to 9 Southampton Row, Holborn.

MESSRS. BAIRD, THOMPSON & CO.'s patent inlets are being used for the ventilation of the new asylum at Mullingar.

THE tender of Messrs. Williams & Williams, of Mountain Ash and Cardiff, being the lowest, has been accepted for building mission chapel, Adamsdown Square, Cardiff, for parish of All Saints.

A FINE new turret quarter-chime clock has been presented to the new Town Hall at Richmond, Surrey, and a set of bells, by Charles Burt, the Mayor, Hillside House, Richmond, Surrey. The dials are lighted by electricity, and the clock has got all the latest improvements inserted from Lord Grimthorpe's plans. The work has been executed by Messrs. William Potts & Sons, Guildford Street and Cookridge Street, Leeds, from instructions received by them from Mr. Ancell, architect, London. Messrs. Potts also recently fixed a new clock at St. Luke's Church, Kingston, Surrey.

WE are requested to state that the business which has for many years past been carried on by Messrs. Robert Steele & Co., iron and brassfounders, of Sleaford Iron Foundry, Sleaford, is now carried on by Messrs. Robert Steele & Co., of Sleaford.

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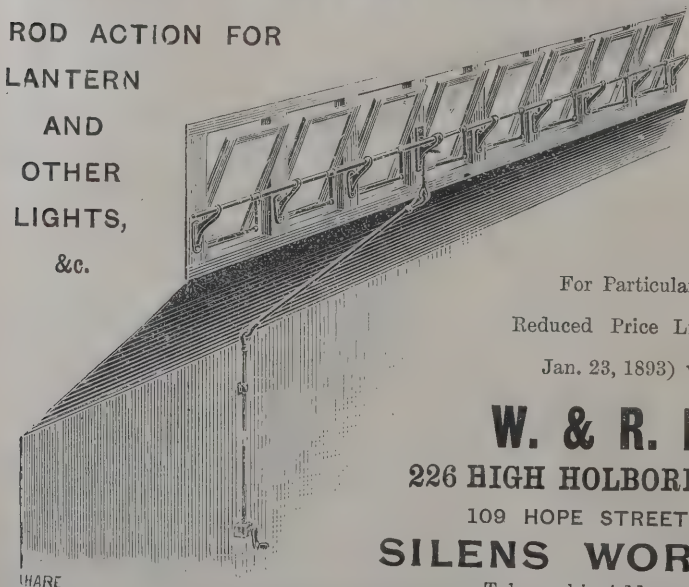
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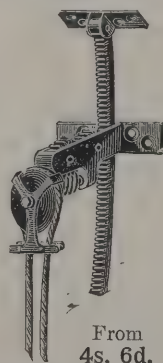


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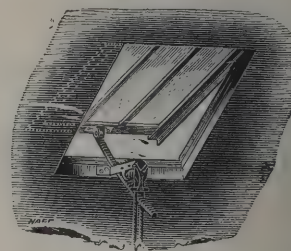
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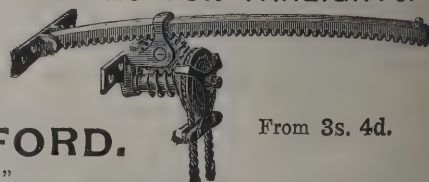
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VOLUME XLVIII. OF THE ARCHITECT.

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ford Street, Nine Elms, S.W., has been purchased by Mr. Joseph Stone, engineer, smith, &c. For the purposes of the new business Mr. Joseph Stone has taken into partnership his nephew, Mr. Chas. Grace, who has been associated with him for many years at the St. George's Road works, and who will in future take charge of the Nine Elms business. The style of the firm will be J. Stone & Nephew, iron and brassfounders.

BUILDING AND BUILDERS.

ADDITIONS are being carried out at the Sydenham branch of the London and South-Western Bank from the designs of Messrs. Folley & Son.

THE Bishop of Liverpool has issued an address to the churchmen of that diocese, urging them to raise a fund of not less than 10,000l. "for the purpose of making all existing church schools in the diocese in which defects have been pointed out thoroughly satisfactory as to their buildings and arrangements, and beyond the reach of condemnation."

THE Fishmongers' Company have in progress industrial dwellings on their Walworth estate, from the designs of Messrs. Chatfield Clarke & Son.

THE BUILDING EXHIBITION.

E. C. Braby & Co.

MESSRS. E. C. BRABY & Co., of Bangor Wharf, Belvedere Road, Lambeth, and Hope Wharf, Hill Street, Peckham, S.E., have an extensive display of various goods in which they are merchants and exporters; among these are to be seen tile dados for walls, rich in colouring and of real artistic merit. Good specimens are displayed of hearths, hand-painted and enamelled tiles in art tints.

Marble paving, which is extensively fixed by this firm, is also shown, and a goodly variety of tessellated and encaustic tile paving. An important show is made of marble and enamelled slab mantelpieces and marble fender curbs, also some handsome stoves.

Large slabs of coloured marble are exhibited with the faces only polished. A collection of samples of English and foreign marbles are at the stand, and can be seen if desired.

The sanitary department of their business is represented by marble lavatories and earthenware pedestal closets, comprising some of the newest designs in washdowns; whilst in the building material department some good specimens of slating and roof-tiling are exhibited, and also samples of a large variety of slates and tiles for roof purposes. This department is receiving special attention at present (the sanitary department is under the management of Mr. F. Kelly), and a new appliance is shown in the way of pedestal washdown closet, "The Trent," shown for the first time, with a patent indiarubber cone that anyone can fix and which also is a novelty.

Joseph Kaye & Sons, Limited.

The model of an emergency exit is shown at the stand of Messrs. Joseph Kaye & Sons, Limited, of 93 High Holborn, the idea of which originated from an architect. The model shows a door, in the centre of which is a panel of glass or other material that is readily broken. In case of an alarm of fire or panic the panel should at once be broken, and then access is obtained to a handle. The handle is pressed down when the door flies open and sets an electric bell going, so that managers, proprietors, &c., at once know that such a door is open as a means of ready escape. The idea of a door as an emergency exit is that it is only required for use in emergencies, and it is therefore kept locked, and cannot be opened without the key except by breaking the glass, when the "open sesame" is afforded, and lock and bolt yield as though they did not exist. This is already in use at London Board schools, and has, we understand, given great satisfaction. We might at the same time call attention to other excellent patent exit door fittings shown by this firm.

Electrical Wonder Company, Limited.

The public are familiar with automatic machines furnished with a slot for the reception of pennies, which are thereby set in action. A series of electrical machines with automatic action show Ahnschütz's instantaneous photographic picture objects in motion. The exactness by which natural motions are reproduced is marvellous, being lifelike. One shows a lady riding on horseback, movements of horse and rider given exact to nature; next a boxing match between two athletes is seen, a march past of soldiers, ladies dancing, performing dogs, parade of lancers, &c. The stand is under the management of Messrs. Lichtwitz & Bros., the head offices

REVOLUTION IN BUILDING.

ARCHITECTS are invited to Inspect the Exhibit of Patent System of FIREPROOF FLOORS, PARTITIONS and CEMENT BUILDINGS in General, &c.

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 NOVEMBER 1892.

being at 425 Strand; also offices at 232 Edgware Road and 91 Brompton Road.

Bedford Lemere & Co.

Messrs. Bedford Lemere & Co. exhibit a choice collection of architectural photographs. In addition to buildings there is a large number of photographs of interiors, with also elaborate woodwork, marble-work designed by architects and carried out; for instance, one shows a beautiful entrance-hall, with noble staircase, &c. One magnificent photograph is the large one of Windsor Castle and its surroundings, which makes a perfect picture. It is seldom the chance is afforded of seeing a representative collection of the works of our architects grouped thus together. Curiosity as well as architectural interest can be gratified from the fine pictures of the many mansions and seats owned by royalty, nobility and distinguished commoners. It may interest many to mention that there are several of the late George Devey's works in the collection. No one visiting the exhibition is likely to pass this stand without lingering rather longer than they intended to inspect the works.

Société des Carrières des Marbres Antique de Saillon.

Researches made during the last twenty years proved that the famous old Cipollino marble was quite exhausted in the ancient quarries that alone furnished it. The old Roman and Carthaginian quarries had been apparently thoroughly worked, and no new beds could be found in the neighbourhood. The above-named company have been most fortunate in bringing the marble again into the market. The quarries discovered a few years since are, however, not in Africa, but on the north of the Mediterranean Sea, in Switzerland, at Saillon, Rhône Valley. It cannot be said for certain that the old Romans were ignorant of the existence of the marble at Saillon, but what is certain is that it is the genuine grand antique Cipollino. The highly-polished specimens shown at the exhibition speak for themselves. A magnificent column, 15 feet in height, that is shown is one of twenty destined for the Pump Room at Clifton, in the West of England, which are the gift of Mr. George Newnes, M.P. The marble-work for this building is being well carried out by Messrs. Arthur Lee & Bros., of Bristol. The following extract is deservedly shown at the stand, being the opinion of so great an authority, viz.:—"When this marble is worked up in columns and polished it resembles woodwork," says Mr. Jaccard, professor of geology, at Locle, in a remarkable study on the Saillon quarries. "One can notice the network, the ligneous fibres,

interrupted at intervals by natural nodosities. In slabs it also resembles ivory. This ribboned structure renders the antique Cipollino more suitable for the monumental decoration of churches, museums, &c. Those who have seen the colonnade of the church of St. Mark, in Venice, will never forget its beautiful effect."

Pickerings, Limited.

Messrs. Pickerings, Limited, engineers and ironfounders, Stockton-on-Tees, exhibit patent automatic self-sustaining lifts. These lifts are well-known and extensively used for service for dinner lifts and for invalid lifts. Sant's patent self-sustainer is a simple contrivance, both for single and double-lift gear, being a box with circular wedge falls. The load-rope wedges itself, and is only released for motion while the hand rope is grasped. It can be applied to any hand or power lifts of any capacity, and to belt power as well. We understand that it is now exhibited for the first time. It should also form a particularly useful adjunct for dinner lifts, and will commend itself to architects. A variety of lifts and hoists is, of course, on view, and among them attention may be drawn to a builder's hoist, self-sustaining, with automatic brake, the whole being simple and uncomplicated, also a self-sustaining quick-action chain sack hoist. Also various other appliances connected with lifting and hoisting purposes.

London Warming and Ventilating Company, Limited.

This company (121A Regent Street, W.) shows stoves and grates for burning anthracite coal. One is shown in action burning anthracite coal. The entire absence of smoke and the amount of heat thrown out can fail to be remarked. By means also of a brickwork chamber, connected, a flow of warmed air can be introduced into the room from the outside. An assortment of other grates, which are also suitable for anthracite coal are shown, various heating stoves, ranges, kitcheners. As regards economy of consumption, the proportion is considered to be that about two tons of anthracite are only consumed, where, with ordinary coal, the consumption would be about 3 tons, and that there is about 30 per cent. increase in the heat thrown out over that of ordinary coal.

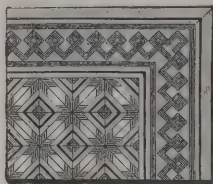
Patent Wire-Wove Waterproof Roofing Company, Limited.

This company (108 Queen Victoria Street, E.C.) show a portable wooden room 14 feet by 10 feet, in sections, roofed with wire-wove waterproof roofing sheets lined with Indian matting,

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Concrete, Stone, and Deal Floors. (See Section.)

ARTISTIC



WOOD CARVING.

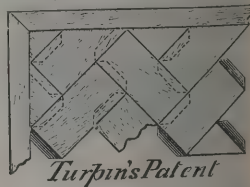
MARBLE

MOSAIC

PAVING.

OAK BLOCK FLOORINGS

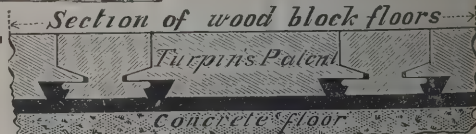
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and standing upon Allport's patent iron foundation shoes of smallest size, and fitted with Major Bale's patent automatic weatherproof louvres. The sheets are formed of papier mâché on a foundation of steel wire gauze japanned or tinned. It is claimed for them that they are damp-proof, sun-proof, cold-proof, tough, flexible, unflammable, enormously strong, light, and almost imperishable. They never warp or buckle. They are 60 per cent. lighter than twenty-four gauge galvanised iron, cost very little for carriage, and require a very slight framework. They make a practically air-tight roof, without any lining. There is no condensation of moisture inside, which is so objectionable and destructive in the case of iron roofs, and for all purposes of portable buildings, including bungalows, &c., the material is excellent. It is also intended to be applied as artists' boards, dados, friezes, panelled partitions, &c., and a special paint can be had as a cheap and effective protection against damp.

T. Freeman.

Mr. T. Freeman, of 200 and 202 Phoenix Street, St. Pancras, and Victoria Street, Westminster, whose exhibits have for the last year or two been an interesting item in the exhibition, has an extensive and well laid out stand in the central part of the main avenue. His display of glazed bricks, white and many tinted, in the form of two or three dwarf walls, is very effective; but he excels in a display of imperishable floor tiling and well-devised faience, forming dados for wall purposes. The tints in this last specialty are remarkable by the absence of undue brilliancy of colour, all shades being toned down and in harmony.

Ellis, Partridge & Co.

Mr. Freeman, who manages the whole of the London and suburban business of the well-known firm of Ellis, Partridge & Co., of Leicester, was deputed by them to exhibit a splendid display of their moulded bricks, known as the "Redbank" brand. Though we had occasion last year to call special attention of our readers to the products from their brickworks at Measham, it is gratifying to us to applaud the distinct advance made in the character of the moulded and other special bricks and terracotta specimens exhibited on this occasion. We have rarely, if ever, seen more perfectly-formed panels, angles, stops, &c.; in fact there is an originality and excellence of design not often met with. Three sections of walls were shown, two of which indicated the character of the Redbank clay when used for

square facing bricks; but as these goods are now so generally adopted by leading architects for facing purposes, we need not further comment on their rich colour and admirable texture and finish. The other section of the wall indicated the effect of Messrs. Ellis, Partridge & Co's sandstocks, "Woodville" brand, a class of bricks most appropriate for mansion and church work.

P. & S. Wood.

Messrs. P. & S. Wood, of South Staffordshire, exhibit this year some fine specimens of stable-paving goods, their panelled brick channel work being much admired. This firm, with a reputation of sixty years, is perhaps more successful than any other house in producing bricks whose vitrified surface and perfectly calcined clay secure an immunity from the ravages of time and the decomposing effects of atmospheric changes.

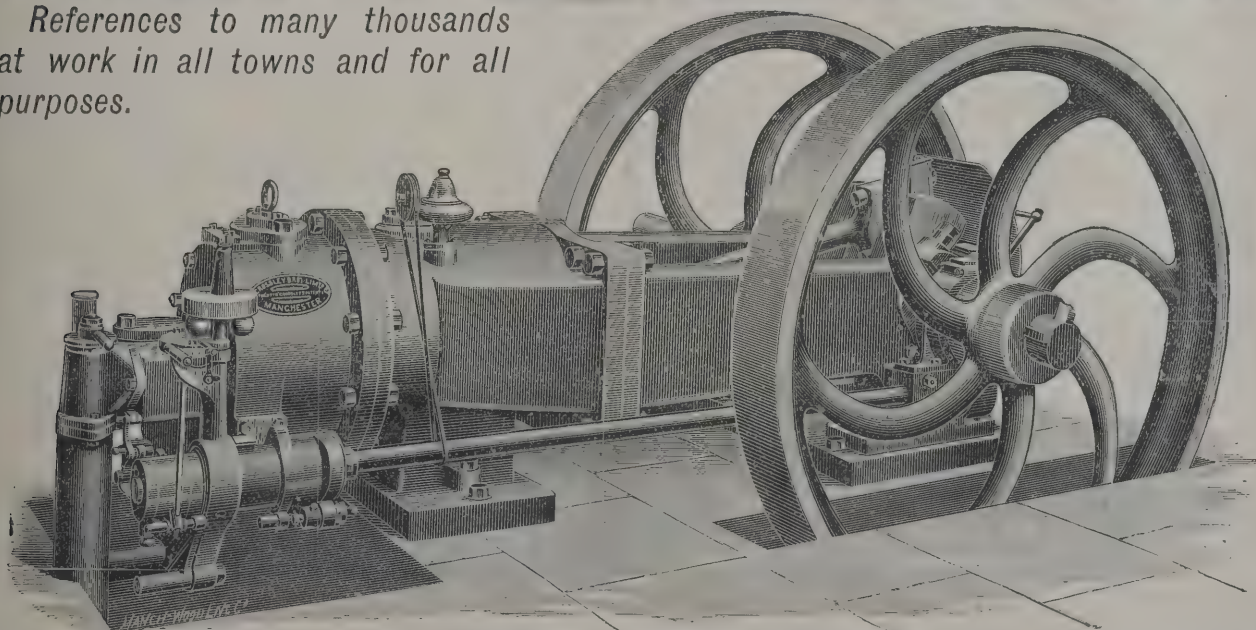
The control of Messrs. P. & S. Wood's business in London and the home counties is in the hands of Mr. T. Freeman, of St. Pancras and Westminster, and we learn from him that during the past twelve months their Pump House works at West Bromwich have been taxed to the utmost to keep pace with the railway, engineering and building contracts entrusted to their care.

Dove's Sanitary Company, Limited.

We cannot too strongly advise inspection of what the above-named company with some reason style "The Perfect Disinfecting Apparatus," which has deservedly been patented by Mr. L. Dove. The apparatus, however, only costs about 2s., but as many of the public besides architects and builders have practical acquaintance with disinfecting chemicals and apparatus, they will be able to appreciate the efficiency of this appliance without difficulty. The apparatus is shown in action at the hall. It is a handy little article which is charged with disinfecting fluid and merely requires to be placed in the flushing cistern, when, at every discharge, its sanitary results follow. The article is merely a small copper vessel, which when charged and placed in position is at once ready for immediate use, and without recharging can be kept at use for months. At the office of Dove's Sanitary Company, Limited, 66 Finsbury Pavement, E.C., where it is in constant use to show customers, the calls are more numerous than would be the case for use in public or private buildings, and we understand that even in this case it will go for five months without recharging. We recommend sanitarians to inspect the apparatus.

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purposes.



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F. Willis & Astley.

A fireproof and ventilating floor is shown by Messrs. F. Willis & Astley, of 34 Ely Place, Holborn Circus. It is patented in England, France, Germany, Belgium and the United States of America. This flooring is constructed with lintels made of the finest fireclay or terra-cotta, and designed in such a manner that the lintels completely encase and protect the bottom flanges of the steel joists upon which they rest, and at the same time are so constructed as to form a perfect ventilating chamber through the floor. The spandrels are filled with concrete carried on thin sheet-iron placed over the lintels, and form a series of arches springing from joist to joist, thus combining great strength with lightness. The flanges of the lintels are so formed as to allow of a circular opening 7 inches in diameter to be cut, and forms direct communication with the air chamber connected with flues constructed in the brickwork, or with gratings built in the walls. Messrs. Frank Willis & Robert Astley are the patentees. A notable feature of the patent floor of course consists in special ventilating properties.

The Safe and Portable Scaffold Company, Limited.

The Safe and Portable Scaffold Company, Limited (Mr. Albert J. Shingleton, managing director), of 110 Kensington High Street, W., show their ingenious apparatus which has been constructed in accordance with its name as a safe and portable scaffold. Its range in height, from 20 to 70 feet, is more than sufficient to meet all usual requirements, though the height of 70 feet could, it appears, be practically exceeded. The desideratum in scaffolding apparatus for working on existing buildings is the securing of safety for the workmen who use it and for the public who walk the pavements of our streets, and these conditions seem amply obtained.

W. R. Hough.

Hough's (135 Great Suffolk Street, Southwark, S.E.) patent reversible sash frame with sliding sashes is shown in the exhibition. The great feature of this patent is that where it is used the danger of ordinary window-cleaning is got rid of. The window has not to be cleaned, as in ordinary windows, from the outside, but the whole window, both the outside and the inside, can be cleaned from inside the room. The advantages of such a sash cannot be too widely recognised, as periodically lives continue to be lost where the old-fashioned sashes are adhered to. Existing windows, it appears, can in a

few hours and at small cost be adapted to Mr. Hough's principle. The whole arrangement also appears simple and free from any complication.

J. M. Boekbinder.

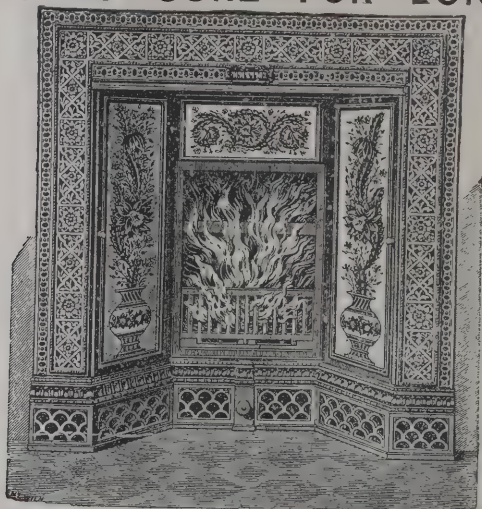
Some specialties of Mr. J. M. Boekbinder, 14A Elm Street, Gray's Inn Road, are shown at the stand of Mr. T. Freeman. Many are already acquainted with the excellent "hand-painted Gobelin tapestries" executed by Mr. Boekbinder. Two of these hand-painted decorations are shown, one after *Les Buveurs*, of Teniers, the other being "A Mad Freak," showing a lad and a lass, the one holding a cat and the other attaching a frying-pan to its tail. Decorations in modelled plaster-work are also shown. Any designs for decorations of walls, ceilings and other interior enrichments can be carried out. As to the excellence of the work, it is only necessary to look at the list of names of architects under whom work has been done, a list which includes the names of nearly all the well-known architects.

Baillie & Lutwyche.

In the notice in last week's issue of *The Architect* of the fine exhibit made by this firm occurred the following:—"A bunch of orchids is remarkably effective, both as regards modelling and shaking." Our readers will have already seen for themselves that "shaking" was a misprint for "shading."

NATIONAL SPORTSMAN'S EXHIBITION.

THE prospectus of the National Sportsman's Exhibition, which is this year to be held at the Royal Aquarium, Westminster, from April 24 to May 6, containing all necessary information for intending exhibitors, has been issued. It is stated that the exhibitions already held in this centrally situated and popular place of amusement have been in the highest degree successful, and the results to exhibitors have been of the most satisfactory character. The attractive entertainment and continual round of amusements given at the Royal Aquarium secure for it at all times a large attendance, and insure its being included in the programme of all visitors to the metropolis. The Royal Aquarium is easy of access, omnibuses and trains from the City and West End continually passing the doors, thus rendering it one of the most desirable sites in London for exhibition pur-

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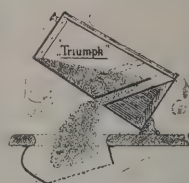
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poses. The National Sportsman's Exhibition will be under the management of Mr. F. A. Cavendish Macdonnell, who has been associated with similar exhibitions for several years, and everything possible will be done to make it thoroughly representative in character and to insure its complete success. The offices of the exhibition are at 341 Strand, W.C., and the space being limited, early application is requested.

WELSH SLATES IN IRELAND.

AT the ordinary half-yearly meeting of the shareholders of the Killaloe Slate Company, Limited, held at Jury's Hotel, Mr. Samuel H. Bolton, builder, presided. The Chairman said the pleasure of meeting the shareholders on this occasion was lessened by the fact that they had no dividend to pay. The reason was want of customers for their slates. When iron was cheap farmers used it for roofing instead of slates. The directors were always on the alert to endeavour to secure an order when they heard of a building being erected. They did the best they could, and endeavoured to keep down the expenses.

Mr. Sharpe said he saw references made in Parliament to the effect that Killaloe slates were not as good as the Welsh slates. That statement had been contradicted, but it had been made again in Parliament in answer to a question; and further said that they were not as cheap as the Welsh slates.

The Chairman said the statement had since been modified. As the question of Government contracts was now under discussion he hoped this matter would not be gone into publicly now.

Mr. C. W. Beggs remarked that if their slates were equal to the Welsh slates, the fact should be made public. The Board of Works and other public bodies should not be left under the impression that the Killaloe slates were inferior to the Welsh.

The Chairman replied that the Board of Works were not under any such impression, for they were using the company's slates. A complaint had been made that the Irish slates were exceedingly thin, and so they were being made to suit the Board of Works.

Mr. Beggs: Is your statement to go forth that the Killaloe slates are not as good as the Welsh?

The Chairman: Our slates are as durable, and we have the proof of half a century for that.

Mr. Walker: In your opinion as a practical man are the Killaloe slates as good as the Welsh?

The Chairman: I say they are as durable.

Mr. Beggs: I don't think that is a fair question to put to the Chairman.

In reply to Mr. Walker, the Chairman said that in certain localities the Killaloe slates were the cheaper. The Bangor slates were the better, but what the Killaloe Company had to contend against was, that inferior Welsh slates were sold as Bangor slates at low prices, and it was difficult to compete against that.

In reply to Mr. Sharpé, the Chairman said the company had at present two contracts with the Board of Works for roofing post-offices. Their slates were being used by the principal public departments.

Mr. Macnie said their slates had been used to roof the Four Courts in Dublin. The Ecclesiastical Commissioners had always used them, and had it not been for the disestablishment of the Irish Church they would use them yet; but very few churches were now being built. The quality of the slates must be good, for they had lasted on the roofs of the churches and on the Four Courts.

The Chairman said another thing the company had to contend against was that specifications were almost always on a stereotyped form, and when architects specified a foreign slate the specification had to be adhered to.

THE BATH STONE FIRMS, LIMITED.

THE fifth annual general meeting of the Bath Stone Firms was held on the 17th inst. Mr. C. J. Pictor presided.

The Chairman said he was glad to be able to present a report which he felt sure they would heartily and unanimously adopt. The total profits for the year amounted to 15,000*l.*, out of which an interim dividend was paid in September last, absorbing 7,043*l.*, and leaving 7,949*l.* now available for distribution. It was now proposed to pay a dividend of 7 per cent., which would leave a balance of 61*l.* 10*s.* to be carried forward. This would make a total dividend for the year of 16*l.* 12*s.* 6*d.*, being an advance of $\frac{1}{4}$ th per cent. To some this might appear an insignificant increase, but to properly appreciate it they must imagine what their feelings would have been had it been so much less. It was a source of gratification to know that,

BARNARD, BISHOP & BARNARDS, L^{IM}.

INVENTORS AND ORIGINAL MANUFACTURERS OF

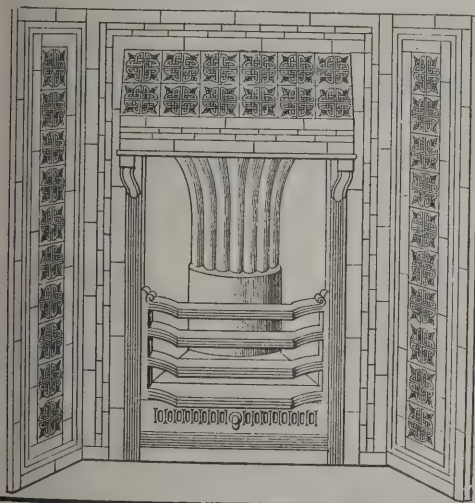
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Architects are invited to Specify these for use in Clubs, Mansions, &c. All kinds of Installation Work executed with the highest class of materials and workmanship.

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notwithstanding the long winter of 1891-92, affecting as it did the trade in the early months of the year, and the strikes in various branches of the building trade by which means the consumption was very much reduced, notwithstanding these drawbacks they had increased their sales for the year. Referring to other portions of the balance sheet he pointed out that the account showed debts due to the company, after making the usual reserves, amounting to 17,215*l.*, as against 5,397*l.* 4*s.* 7*d.* owed by the company, leaving a balance to their credit of 11,818*l.* The cash balance at their bankers and in hand was 10,378*l.* He was sure they would think this a very excessive sum, but efforts had been made, so far without much success, to find suitable investments, and the directors would be glad if the shareholders could introduce some good mortgages. In addition to cash in hand they held bills receivable to 2,580*l.*, and capital invested 11,817*l.*, 3,018*l.* of which had been invested during the year. 16,865*l.* was the total sum now written off for depreciation; there had been no special expenditure during the year, and none except what had been paid out of the current year's revenue. In conclusion he said he was sure they could not be other than satisfied with the past year's work, and moved the adoption of the report and accounts.

Mr. Sumsion seconded the motion, which was carried *nem. con.*

On the proposition of the Chairman, seconded by Mr. J. Stone, it was unanimously agreed that a dividend at the rate of 7 per cent. per annum should be declared for the half-year ending December 31.

The retiring directors, Messrs. I. Sumsion and R. Cripps, were unanimously re-elected on the motion of Mr. J. Pyke, seconded by Mr. Wilson, and appropriately thanked the shareholders for the honour thus conferred upon them.

Mr. Randall proposed that the remuneration of directors, other than the manager and secretary, for the year 1893 be at the rate of 100*l.* for every 1 per cent. dividend actually paid to the shareholders, and so in proportion with every fraction of 1 per cent.

Mr. Chirnside seconded, and spoke of the care, ability and conscientiousness with which the directors discharged their duties, especially alluding to the practical experience of the Chairman. Carried.

Mr. H. Pictor proposed that Messrs. Cooper Bros. & Co., chartered accountants, London, be re-elected as auditors at a remuneration of 70 guineas per half-year, including expenses.

Mr. Giles seconded, and the proposition was adopted.

Mr. Hancock stated that the Fluete was making satisfactory progress and was being used on Portland and other stones as well as Bath stone. Mr. Brydon had specified it for use on the new Municipal Buildings in Bath. As to the railway rates, they had been given much trouble, but he was not without hope that the directors had succeeded fully in their negotiations with the railway authorities, though he could not say absolutely then. The directors looked upon the question, however, with considerable satisfaction.

A vote of thanks to Mr. Pictor for presiding, and Mr. Hancock for his remarks, brought the meeting to an end.

TRADE UNIONS IN THE UNITED STATES.

THE report of the Royal Commission on Labour dealing with the United States gives some details of the working of the trade unions there. The New York unions are especially strong, but, on the other hand, the presence of a large foreign element, constantly recruited by immigration, constitutes a peculiar difficulty. The unions aim at converting all establishments in which their members work into "union shops," where none but unionists are employed; but there are individuals and agencies in New York who make a business of organising gangs of men to take the place of unionists on strike. Sometimes these individuals contract to furnish employers with cheaper labour on condition of themselves receiving the post of foremen. They draw their supplies from the country towns and villages as well as from abroad, and it is stated that employers who wish to replace unionists by the cheap labour give notice of a reduction in wages and bring on a strike. If, however, the establishment is then converted into a "mixed shop," the representatives of the union try to get employment in it, and by mixing amongst the newly-imported labour and exercising their influence to bring matters back to their old condition. The most effective instruments in the hands of the unions are the "shop committees" and the "walking delegates." The former is a small body of workmen entrusted with the care of the union interests and empowered to watch for the due observance of the union rules. They call meetings of the employes, and have been known to do so during working hours, though this is not usual. The employers frequently complain of their action, and still more of that of the "walking delegates," or inspectors appointed by the unions in industries such as building or house-painting, which are carried on in many different places. A number of

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cases are reported in which men at work on buildings were ordered by a walking delegate to lay down their tools and quit work because of some infringement of union rules or the presence amongst them of a non-unionist. During 1890 strikes ordered by these inspectors are said to have occurred in the building industry upon every working-day. According to the Illinois Bureau of Labour Statistics the American trade unions owe their existence to the growth of the factory system and the consequent estrangement of the employer from the workman. They first came into prominence at the beginning of the present century, in a period characterised by the same abuses in respect of long hours, low wages, insanitary conditions and excessive labour exacted from women and children as are recorded in England prior to the passing of the Factory Acts. But in the opinion of several writers of authority the history of trade unions has been less satisfactory in America than in England, owing to the democratic character of the people, the mobility of labour and the independence of the American mechanic. They are still seeking many things already gained in England, such as the abolition of the truck system and the complete legal recognition of the unions. The Pennsylvania Bureau of Industrial Statistics reports that American trade unions issue fewer publications than those in Great Britain, and attributes this to the comparative indifference of members. Branch unions sometimes repudiate the ordinary dues when called upon to pay them, preferring to be cut off from the main body; but in times of difficulty they have been known to return and pay up arrears. All the unions amongst employés are in principle in favour of arbitration as a means of preventing strikes, but the strike expenditure is still very considerable, and arbitration is less successful in America than in England, because the American trade unions are much weaker and less highly organised.

THE SANDGATE LANDSLIP.

THE following report has been made by Mr. Walton, engineer of the Local Government Board, who was deputed to examine the area of the landslip and report as to its probable cause:—

The first of the indications of the landslip occurred on the afternoon of Saturday, March 4, at about 5 P.M., and a further movement took place on the following day. The disturbed area is included within the boundaries of a roughly-shaped segment as shown on the accompanying plan, the chord of which measures about 2,800 feet. The arc of the segment intrudes

into high land; and the chord line follows an irregular course along the foreshore, between high and low-water mark. Along this line there are visible signs of a slight upheaval, a layer of blue clay being obtruded through the line of structure. Fresh water was in some places running from the fracture at the time of my inspection. The whole of the disturbance north of the main road appears to consist of a *débris* of a former landslip which probably occurred many years ago, perhaps centuries. The strata consisted of fine loam sand, green sand and layers of clay. The maximum depth of subsidence is about 10 feet. The chief features and cracks are generally in a direct parallel to the curve of the segment. The movement appears to me to have been confined to subsidence, as I find no proof of a general lateral action. In some places the land has slipped, but in such cases the lateral motion has, I think, been due to the previous steep inclination of the surface. Seventy-four houses have been injured, more or less, some beyond repair, and ninety-four houses in all have been vacated. The new sewerage works, being outside the disturbed area, have not been injured in any way by the landslip, but an 18-inch sewer-pipe laid from the camp at Shorncliffe has been broken in several places, and its massive masonry outfall conduit has been raised and fractured by the upheaval of the foreshore. The old sea-wall has been cracked through in places, but the new sea-wall is uninjured. The water and gas pipes have been fractured, and are now under process of repair. The sewer from the camp is also under repair. The pavements and kerb-stones which have been displaced are being rapidly relaid. Two sea-groynes have been injured, and the coastguard station has suffered considerably. As a possible cause of the disaster, it was stated that for some period concluding last year operations had been carried on for the removal of the steamship *Benvenue*, which had stranded at a point about 600 yards seaward of the front of Wellington Terrace. It was said that the shocks from the explosion were perceptible on shore. Most of the houses have little or no foundations. The rainfall for the month of February was said to be abnormally copious, and that as much as 2.31 inches is recorded as having fallen in one week of that month. No observations have been taken at any time as to the height of the subsoil water. It would appear from the evidence of several gentlemen that for some time past a variation in the disposition of subsoil in water has been noticed, and as instances in support of this, it was stated that the foreshore in front of Wellington Terrace was formerly liable to a general weep of fresh water, which for some months past has discon-

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tinued. Also that a walk in a private garden, which had been previously subject to springs, had recently become dry. Then, I understood a slip occurred in land situated at or near the level of the main road. Another instance is a large lawn situated in high land, which defied all attempts to keep it free from springs until about a year ago, when it suddenly became dry and firm. A well situated a little above the level of the main road was pointed out to me as one in which the water would not rise, but in which for the past few months the water had accumulated to a high level. My inquiry was conducted under great disadvantages, as there were no recorded observations of the levels of the subsoil waters, no sections of the cliff or of the foreshore, and no geological plan. Taking into consideration the limited time at my disposal, and the entire absence of any reliable data, it is quite impossible to form anything but conjectural conclusions as to the cause of the disaster. From what I saw, and from the evidence, it seems to me probable that the cause was due to the sudden release of impounded subsoil water. I was also told that from time to time subsidences of minor parts had occurred, and I noticed that many houses had evidence of repaired and patched-up cracks upon them. There appears to be some difference of opinion as to the foreshore. It was asserted that since the completion of the groynes the aggregation of shingle on the shore had been most marked, whereas it was also said that the angle of the foreshore had increased very much recently, due, it was alleged, to the process of erosion caused by the action of the sea. I noticed small streams of water in many places running into the fissures and cracks, also surface depressions upon which water would lodge. These conditions, I think, are favourable to further subsidence, and I am strongly of opinion that the earliest steps should be taken to prevent the accumulation of water on the high ground by the construction of surface gullies or drains, by which it can be taken by the most expeditious route to the sea. I expressed my opinion to the local board (as to the probable cause of the disaster) in terms as stated above, and I recommended them to procure the services of an experienced engineer to advise them as to the steps to be taken in the general interest of the ratepayers; and, as a temporary measure, I suggested the propriety of inducing those interested in the safety of the place to make early arrangements for the passage of the subsoil water from the high land. I also expressed an opinion that probably the introduction of a proper system of surface and subsoil drainage would prevent further disaster.

THE ARBITRATION COUNCIL BILL.

THE text of the bill to establish Councils of Arbitration in trade disputes has been published. The bill is backed by Mr. Cayzer, Sir F. Dickson-Hartland, Baron Henry de Worms, Sir George Baden Powell and others. The principal clauses are as follows:—

2. This Act shall not apply to Ireland.

3. In this Act—

The expression "district" shall mean the area under the authority of a County Council.

The expression "County Council" shall, in the application of this Act to England, include the council of a county borough.

The expression "employer" shall mean any person or body of persons, corporate or incorporate, employing not less than twelve workmen in the same business, or department of the business, in which the trade dispute has arisen.

The expression "workman" shall mean any person in the employment of an employer as defined by this Act.

A "trade dispute" shall be deemed to have arisen whenever a difference exists between an employer and his workmen which may seriously affect the employer or the workmen, or when a strike or lock-out is threatened or has actually taken place.

The expression "board" shall mean a board of conciliation and arbitration as established under this Act for each particular district.

4. (1) A board of conciliation and arbitration shall on or before January 1, 1894, be established in every district.

(2) The board shall consist of five members, to be appointed by the County Council in each district, of whom two shall be employers or members of some association representing employers, and two shall be workmen or members of some trades union, and one shall be neither an employer nor workman, nor a member of any association representing employers or any trades union.

(3) The first appointment by the County Council shall be made on or before January 1, 1894, and the members so appointed shall hold office for two years subject to reappointment.

At the expiration of two years from January 1, 1894, and of every subsequent period of two years, the County Council shall again appoint five persons to be members of the board in place of the retiring members, and such persons shall, subject to reappointment, hold office for two years.



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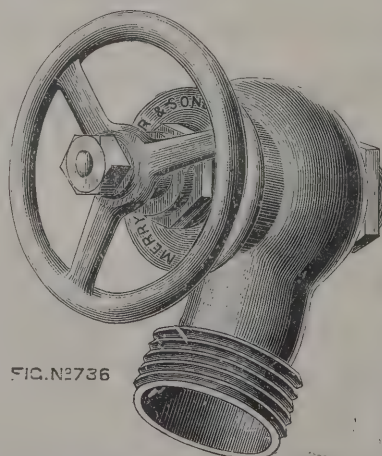


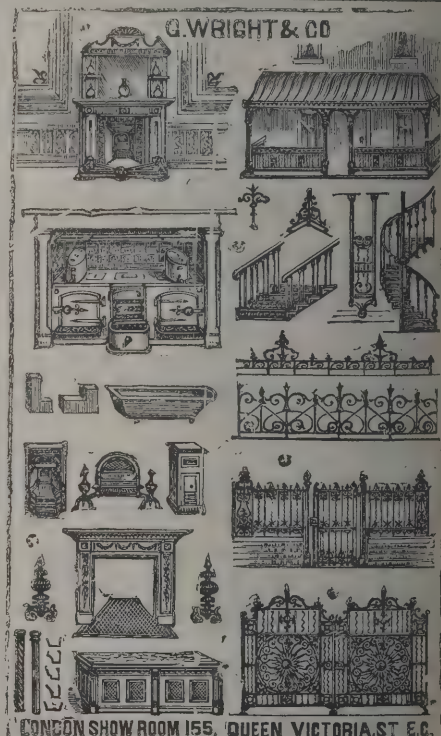
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(4) In case of the bankruptcy or lunacy of a member of the board he shall forthwith vacate his office of member.

(5) The County Council shall upon the death, bankruptcy, lunacy or retirement of a member of the board, appoint some other person to act in his place for the remainder of the term for which he was appointed.

5. When a trade dispute has arisen in any district between an employer and his workmen the board of that district shall, upon application as hereinafter provided, and may without any such application, put themselves in communication as soon as may be with such employer and workmen and invite the parties or their representatives to a friendly conference, and endeavour by mediation to effect an amicable settlement of the dispute, and if a settlement is effected a memorandum of the terms shall be drawn up by the board and signed by the parties or their representatives, and a copy thereof shall be delivered to each party or their representatives and the original kept by the board.

6. The application above referred to shall be an application made by the employer or by 10 per cent. or more of his workmen employed in the business or department of the business in which the trade dispute has arisen, or by his or their duly acknowledged agent or by both parties. Such application shall contain a statement of the matters in difference between the parties.

7. In case of failure to effect an amicable settlement as is above referred to, the board shall give public notice that they will hold an inquiry into the matters in dispute and invite all persons interested to attend and give evidence thereat.

8. The board at the conclusion of the inquiry shall make a report stating the causes of the dispute, the decision of the board as to the proper settlement of the dispute, and what parties (if any) are responsible for the same, and shall publish such report in any manner they may think fit.

9. For the purposes of the Act the board shall have power—

(a) To visit the locality where the trade dispute has arisen, and to hear all persons interested who may come before them ;

(b) To summon any person or experts to attend as witnesses or give evidence before the board ; and in the case of any persons summoned refusing to attend, to apply in a summary way to a justice of the peace having jurisdiction in the district for an order compelling such attendance, and such justice of the peace is hereby empowered to make such order ;

(c) To administer an oath to, or take an affirmation of, any

person attending as a witness before the board, and to examine any such person on oath or affirmation.

10—(1) The members of the board and the clerk (if any) appointed by them shall be paid such honorarium out of the funds of the County Council for their services as the County Council may from time to time determine, and they shall also be reimbursed out of the funds of the County Council for any expense incurred by them for obtaining professional assistance.

(2) The witnesses summoned by the board shall be paid their travelling expenses and such further sum, not exceeding ten shillings a day, as the board may think proper.

11. All payments authorised to be made by this Act shall be paid out of the County Council general assessment or rate of the nature of a general assessment of the district where the trade dispute has arisen. The County Council in each district is hereby empowered to raise funds for these purposes if necessary to do so.

12. The board in each district shall forthwith frame rules under this Act for the purposes of regulating their procedure. Such rules shall be submitted to and approved by the County Council, and may from time to time be altered by the board with the like approval.

AMERICAN ENGINEERS AND THE CHICAGO EXHIBITION.

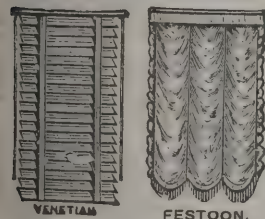
A CIRCULAR note was issued in 1891 to every member of the American Society of Civil Engineers, asking for subscriptions to the sum of 3,000 dols. toward defraying the expense of maintaining suitable headquarters for the accommodation of engineers during the Columbian International Exposition of the present year. This sum has been fully subscribed, and the Board of Direction of the Society now find it necessary to call for a much larger subscription to enable it to perform the duty, which it has assumed, of the direction and management of the department of the Engineering Congress devoted to civil engineering.

Ninety-eight papers have thus far been promised, and others may yet come. These are distributed as follows :—From the United States, 36 ; Germany and Austria, 26 ; England, Scotland and Ireland, 10 ; Portugal, 6 ; Italy, 4 ; Holland, 4 ; France, 2 ; United States of Colombia, 2 ; Mexico, 1 ; Argentine Republic, 1 ; Russia, 1 ; Australia, 5. They cover a large portion of the subjects on which papers were invited, and most of them from the foremost engineers of the countries named.

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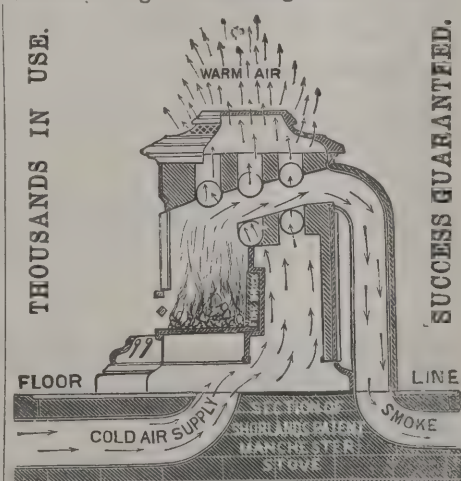
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The board has appointed a committee to report upon the establishment of a bureau of information and courtesy at the Society's house in New York City, where visiting engineers on arriving may obtain information regarding points of interest in this country, and directions for reaching them. It is believed that such a bureau will prove an important factor in increasing the prominence and usefulness of our Society. The committee estimates the expense of establishing and maintaining such a bureau during the exhibition at 2,500 dols.

The Board of Direction, in view of these facts, deems it its duty to ask the members to contribute the sum of 15,000 dols. to meet the expenses mentioned. If every member contributes his proper quota, he will make sure of the reception of two valuable volumes from the Congress, the sum will be easily raised, and we shall have the satisfaction of thoroughly upholding the reputation of the Society, and doing well the work we have undertaken.

A later circular relating to the annual convention at Chicago states that it is impossible now to predict whether there will or will not be any difficulty in obtaining good accommodations at moderate prices, if each individual waits until about the time of the convention and looks out for himself. The general opinion in Chicago seems to be that there will be no great difficulty, and that the supply of rooms will more than equal the demand. There will be a great advantage, however, in having the Society located in a body at one large hotel, convenient to the Art Building, where the sessions of the world's congresses will be held, and at the same time within easy access of the exposition grounds. The Society is prepared to make contracts now, either on the European or the American plan.

The minimum rates at which first-class accommodations can now be secured are:—For room only, 3 dols. for each person per day; and for room with board, 5 dols. for each person per day. This figure is based on prices at well-constructed hotels within ten minutes' walk of the exposition grounds, and twenty-five minutes by rail of the art building; at least two persons to be in an ordinary hotel room, separate beds being provided. It is possible that cheaper accommodations than this may be secured, but at present it is not thought wise for the Society to undertake to provide them. More expensive rooms can now be secured by individual application to the hotels.

CONSTRUCTION IN QUICKSAND.

A LECTURE was delivered at the School of Mines, Columbia College, New York, recently, by Mr. R. L. Harris, C.E., on foundations, especially in regard to his method of hydraulic construction in quicksand and other fine materials. After alluding to various modern methods for difficult foundations as pneumatic, bucket dredged, contained caisson and the freezing process, the speaker described the especial subject of the lecture, structures in quicksand. He said that quicksand is a bane of engineers and builders. It has sunk millions of capital, and has caused the abandonment of extensive enterprises. I had known from observation that fine quicksand is widely scattered, but had no idea until recently that it is so extensively distributed. During the past six months I have received complaints of it from Puget Sound to Maine, and between the Gulf of Mexico and Canada, from the interior as well as near the great bodies of water. As cities build deeper, and municipal improvements go deeper still, we learn more of what is beneath than when our works were nearer the surface. The process of which I am to speak is proposed for upwards of twenty engineering substructures located in fifteen different states.

Upon some important work in Providence, R.I., an intercepting sewer 6 to 8 feet in diameter, a halt had been called on account of the quicksand encountered. The contractors for the worst sections claimed that it was ruinous for them to proceed and had petitioned the City Council to release them from their contracts and cancel their bonds, which was subsequently done. Nearly all the work and trials had been made by the usual methods of sheeting, excavating and pumping out,

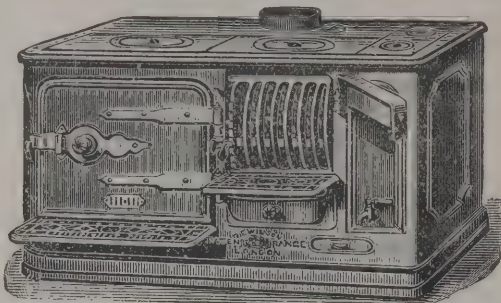
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reducing the water-level. These resulted in the sinking of considerable tracts of the original surface 4 to 5 feet, carrying down forest trees, building material, &c. Experience prompted me to consider the reverse of these processes, that of pumping in material which should solidify the troublesome quicksand in place, while in its normal condition and before injurious sub-currents should be established, in fact, to make it its own protector. The problem was separated into three divisions, which, as they represented unknown quantities to be obtained, we will designate by the algebraic characters, x , y , z . These were, then, x , to find a cementing substance, fluid or otherwise, that should unite with and solidify this extremely fine and light, yet compact and hard quicksand; y , to form channels and chambers at any depth underground and of desired form without extensive disturbance of the surface or the neighbouring materials; z , to fill such chambers and permeate the interstices of the adjacent materials with the cementing substance x . The divisions y and z comprised a pretty riddle. It was to put a fluid, say, 40 feet into the earth and below water-level in such a way that it shall mix with the material there for a defined area of, say, 12 by 30 feet, and solidify the same, so that if an excavation is made a month or a century hence that floor will be found as you now determine. Could a cementing fluid be forced through and into fine sand at a depth below the surface? Would it remain in a cavity already filled with incompressible water? Would it harden sufficiently within reasonable time under the buried conditions and in predetermined shape? Could the pipes be used and removed without being clogged or made useless? A trial was made on the work during the second week in March and in freezing weather, as bad as any experienced during the winter. The answers to the queries suggested were satisfactory. The results, despite the adverse circumstances, were successful, and fully demonstrated the method, and that it would be under complete control. The engineers and contractors of the work promptly and cordially expressed their satisfaction with the trial and their confidence in the new method. The result is that x , y , and z are determined both theoretically and practically. The ultimate results should be far-reaching and of great benefit. The method is applicable not only to quicksands but to other sands and the finer earthy materials. The applications are innumerable, enabling engineers and builders to make constructions in many of the fine, loose or soft materials, largely of the substances themselves, at any depth below the surface or of the adjoining material, as, for example,

shafts, tunnels, bridge foundation or canal repairs, waterworks, sewers, harbours, shore protections, jetties, buildings, &c., and perhaps there may be found herein the solution of a difficult problem in rapid transit for cities.

THE ST. LOUIS AND CHICAGO ELECTRIC RAILWAY.

THE contract has been signed for constructing the new line between St. Louis and Chicago, on which the motive power is to be electricity. It is proposed to operate from two or more power stations located at the mouth of two or more coal-mines situated along the line of route. These mines will be operated by means of electric-mining locomotives, electric drills, cutters and lights; and part of the coal thus cheaply obtained will be sold, while the rest will run the engines developing the electric power. The prospectus of the company gives the following details of the line:—"The road, which is 248 miles in length, will be divided up into twenty-five sections of ten miles each. The cars will run one section apart, and no current will flow in the intermediate section, so that it will be absolutely impossible for cars to come within ten miles of each other. This will constitute a complete block system, which will make it impossible for any two cars to run upon a single section at the same time, thus making collisions absolutely impossible. The road will be illuminated by incandescent electric lamps for one mile ahead and one mile behind every car while running at night. It will be built in a practically straight line. It will have no railroad or country road crossings at grade or on a level with its own line. The country roads are to be thrown up over the tracks of the Chicago and St. Louis Electric Railroad, by means of 248 wooden bridges, while the tracks of railroad will be thrown up over the crossing tracks of other railroads by means of seventeen stronger bridges. In addition to this, there will be no frogs or switches to break the main line and no drawbridges. The company will ultimately construct four tracks, two light-weight outside tracks for local traffic and high-class freight, and two heavy-weight inner tracks to be used exclusively for through passenger traffic, mail and express. At first, however, only the two through tracks will be constructed. The through cars will not stop anywhere between the two terminal cities between which they run. The standard schedule time of all through cars will be 100 miles per hour. The electric coach or car that will be run upon this road is long, low, compact and light, but strong,

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having two pairs of driving wheels, each of which are driven by a separate and distinct electric motor. The whole weight of the car, with its passengers, and of the two electric motors comes upon these two pairs of driving wheels, and is, therefore, all available for adhesion between the rails and the wheels, through the agency of which the car is propelled. The top of the car stands only 9 feet from the rail, making it 3 feet lower than the ordinary street car. This brings the centre of gravity very low and near to the track, which makes it practically impossible for the car to jump the track. The car has a wedge-shaped nose or front for cutting the air, which has the effect of decreasing the atmospheric resistance and of helping to keep the car upon the track. The motorman stands immediately back of this wedge-shaped front, and between his department and the rear wheels is the compartment for the accommodation of passengers. In the rear of this is a separate compartment for mail and high-class express. The driving-wheels are 6 feet in diameter, and are capable of making 500 revolutions in one minute, which would give to the car a speed of over one hundred miles per hour. With this large driving-wheel the axle does not revolve at any higher speed than the axles under an ordinary passenger coach when travelling at fifty miles an hour; hence the friction will be no greater. In addition to this the axles will turn on roller bearings, requiring no oil. The weight of the entire car with its motors, will not exceed fifteen tons. These electric coaches or cars will be illuminated and heated by electricity, and will contain all the modern appointments for the comfort of passengers. It will be possible to stop a car within half a mile by means of the motors themselves, in conjunction with auxiliary electric and air brakes. The road will be operated by multi-phased alternating currents of electricity similar to those used at the Frankfort-Lauffen power installation at the recent Frankfort Exposition. Motors operating under this system require no commutators or brushes, and they may be so constructed as to be water and fire proof. An overhead electric construction will be used consisting of central poles and cross arms with a trolley wire running along the side of the car. This project is, in the main, founded on that which has been actually accomplished. For instance, the possibility of transmitting power electrically over long distances with economy was demonstrated at the last Frankfort Exposition, where 300 horsepower was transmitted electrically over a distance of 108 miles, with an efficiency of 75 per cent., and again the physical possibility of running a car at the rate of 100 miles per hour was demonstrated at Laurel, Maryland,

recently, where an electric locomotive weighing but $2\frac{1}{2}$ tons was propelled around a circular track $2\frac{1}{2}$ miles in circumference at a speed of 115 miles per hour without any derailment. It will therefore at once be seen, say the company, that there is nothing at all impracticable about an undertaking which contemplates the electrical transmission of power over only a 55-mile circuit, and the operation of 15-ton cars on a straight track at a speed of only 100 miles an hour." The promoters claim that the line can be worked at a very much smaller cost than a steam railway doing the same business.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 4749. Charles Rice, for "Portable doorstep for preventing doors being shut."
- 4856. William Thomas Mortimer, for "An improvement in bolts."
- 4867. Thomas Marker, for "An improved lift or elevator."
- 4902. Alexander Mackenzie, for "Improvements in apparatus for heating water for baths and other purposes."
- 4908. Joseph Armishaw, for "Improved means for controlling window-sashes."
- 4924. Joseph Reid, for "Automatic spring-tap."
- 4937. Napoleon B. Rees, Eli L. Dale and Henry Zink, for "Improvements in time-locks for safes."
- 4952. Willoughby Statham Smith and William Puddicombe Granville, for "Improvements in electrical relays and measuring instruments."
- 5009. Alexander Basil Wilson, for "Improvements in the construction of cocks."
- 5032. Gerolt Gibson, for "An improved sash-lock for windows."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

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See **BUILDERS' EXHIBITION,**

STAND No. 26.

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COMPETITION OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

ABERDARE.—March 31.—For Building Twenty Dwelling-houses. Mr. C. H. Elford, Architect, 34 Canon Street, Aberdare.

ALCESTER.—April 12.—For Building Six Almshouses. Mr. E. H. Lingen Barker, Architect, 146 St. Owen Street, Hereford.

BARNSELEY.—April 5.—For Building Two Houses, &c. Mr. Herbert Crawshaw, Architect, 1 Regent Street, Barnsley.

BARNET.—March 31.—For Building Four Small Houses. Mr. Byfield, Solicitor, Barnet.

BELFAST.—April 6.—For Erection of Sheds and other Structures for Agricultural Show. Mr. John Boyd, 117 Victoria Street, Belfast.

BLAENAVON.—April 1.—For Building Master's House. Mr. E. A. Lansdowne, Architect, Newport, Mon.

BRAINTREE.—March 31.—For Building Cottage at Waterworks. Mr. J. H. Jevons, Surveyor, Waterworks Office, Braintree.

BRAINTREE.—March 31.—For Providing and Fixing Air Vessel and other Work. Mr. J. H. Jevons, Surveyor's Office, Waterworks, Braintree.

BRISTOL.—April 6.—For Building the Caxton Works. Mr. Henry Williams, Architect, 28 Clare Street, Bristol.

BRISTOL.—April 7.—For Building Recreation Room, Extension of Dormitory and other Works at Diocesan Training College, Fishponds. Mr. Wm. L. Bernard, Architect, 3 St. Stephen's Chambers, Baldwin Street, Bristol.

CHERTSEY.—April 12.—For Construction of Sewerage and Sewage Disposal Works for Weybridge and Oatlands. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

CLEATOR MOOR.—April 1.—For Converting Cottages into Shops. Mr. M. W. Coulthard, 52 High Street, Cleator Moor.

CO. WICKLOW.—April 3.—For Building House for Resident Priest, Greystones. Mr. P. F. Comber, C.E., 8 Anglesea Street, College Green, Dublin.

FULHAM.—April 5.—For Building Diphtheria Wards at Western Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

HADFIELD.—April 4.—For Taking Down and Rebuilding Shops. The Secretary, Equitable Co-operative Society, Limited, Hadfield.

HASTINGS.—April 10.—For Building Technical School, Manor Road. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

LIVERPOOL.—April 5.—For Erection of Mortuary Buildings and Alterations to Local Board Offices, Toxteth Park. Mr. J. Price, Engineer, Local Board Offices, Lark Lane, Toxteth Park, Liverpool.

LLANBRADACH.—March 31.—For Building Hotel. Mr. John Williams, Architect, Morgan Town, Merthyr Tydfil.

LLANDOVERY.—April 3.—For Repairs to Town Hall. Mr. Daniel Phillips, County Surveyor, Carmarthen.

MANCHESTER.—April 7.—For Construction of Gasholder Tank, Bradford Road Works. Mr. C. Nickson, Superintendent, Gas Department, Town Hall, Manchester.

MIDGLEY.—April 1.—For Building Timber Store, Barn, Stable, Mistal, Cart Shed and Three Through Houses. Mr. T. Lister Patchett, Architect, George Street Chambers, Halifax.

NAVIGATION.—March 31.—For Building Three Shops. Mr. Arthur O. Evans, Architect, Pontypridd.

NEWBURY.—April 3.—For Building Retort House and Coal Store. Mr. Robert M. Couper, Engineer, Gasworks, Newbury.

PETERBOROUGH.—March 31.—For Additions to Corn Exchange. Mr. H. M. Townsend, Architect, Cross Street, Peterborough.

PWLLGWAWN.—March 31.—For Building Infants' School with Outbuildings, Boundary Walls, &c. Mr. J. J. Evans, C.E., Penarth.

QUEENBOROUGH.—April 5.—For Laying Water Main Supply of Material, Hydrants, Sluice Valves, Connections Stopcocks, Covers, Casings, &c. Mr. W. J. Harris, Town Clerk, 76 High Street, Sittingbourne.

RUAN MAJOR.—April 1.—For Erection of Farm Buildings. Mr. G. Gow, Tregothnan Office, Truro.

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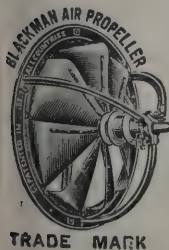
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SELBY.—April 4.—For Additions, &c., to Burn Hall, Top House, Paper House, Haddesley Lodge, Farm Premises and Cottages. Mr. J. S. Ullathorne, Architect, Millgate, Selby.

SOWERBY.—April 3.—For Additions to St. Oswald's National Schools. Mr. T. Stokes, Architect, Thirsk.

TIPTON.—April 6.—For Alteration and Enlargement of Board Schools. Mr. Alfred Long, Architect, 319 High Street, West Bromwich.

TENDERS.

BOURNEMOUTH.

For Supply and Delivery of 48-inch Cast-iron Pipes and other Specials for Bournemouth Pier Outfall. Mr. F. W. LACEY, Borough Engineer.

Macfarlane, Strang & Co.	£3,721	9	1
E. Howell	3,017	11	6
D. Y. Stewart & Co.	2,963	10	8
Stockton Forge Company	2,746	0	0
Stanton Ironworks	2,661	1	10
J. & S. Roberts, Limited	2,640	3	5
Cochrane & Co.	2,609	9	4
Cochrane, Grove & Co.	2,608	16	8
C. Jordan & Sons	2,529	10	9
Oakes & Co.	2,431	13	4
STAVELEY COAL AND IRON COMPANY (accepted)	2,389	16	7
Steel Pipe Company (informal)	—	—	—

Boscombe Outfall.

Macfarlane, Strang & Co.	£2,589	3	8
E. Howell	2,203	9	0
D. Y. Stewart & Co.	2,047	4	11
Stockton Forge Company	1,909	6	10
Stanton Ironworks Company	1,845	16	4
Cochrane & Co.	1,837	14	5
J. & S. Roberts, Limited	1,775	4	8
Cochrane, Grove & Co.	1,764	6	11
C. Jordan & Sons	1,748	6	11
Oakes & Co.	1,695	16	0
STAVELEY IRON COMPANY (accepted)	1,670	3	10
Steel Pipe Company (informal)	—	—	—

BECKENHAM.

For Improvement Works, Burrell Row, Beckenham. Mr. G. B. CARLTON, Surveyor.			
Iles & Co., Wimbledon	£438	0	0
Mid-Kent, Beckenham	360	0	0
Neave & Son, Paddington	327	0	0
MOWLEM & Co., Westminster (accepted)	316	0	0
Surveyor's estimate	319	18	4

BRIXHAM.

For Lengthening Fish Market for the Commissioners of the Harbour and Market of Brixham, Devon. Messrs. G. S. BRIDGMAN & SON, Architects. Quantities by the Architects.

S. T. Collings, Brixham	£259	12	4
N. DUNSTONE, Brixham (accepted)	204	18	11

CARDIFF.

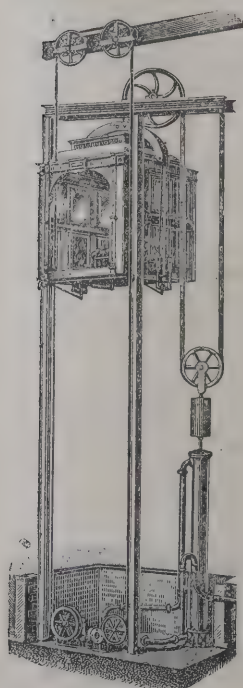
For Rebuilding the Duke of Wellington Hotel, The Hayes, Cardiff, for the Cardiff Brewery Company. Messrs. J. P. JONES, RICHARDS & BUDGEN, Architects, Cardiff. Quantities by Architects.

G. Griffiths, Cardiff	£2,875	0	0
Ivins, Anderson & Co., Cardiff	2,820	17	0
F. Ashley, Cardiff	2,741	4	11
D. C. Jones & Co., Gloucester	2,689	0	0
David Davies, Cardiff	2,650	0	0
D. J. Davies, Cardiff	2,600	0	0
E. C. Newby & Co., Cardiff	2,569	12	9
Jones Bros., Cardiff	2,550	0	0
W. Symonds, Cardiff	2,466	0	0
James Allan, Cardiff	2,450	0	0
A. Lewis, Cardiff	2,400	0	0
Henry Davies, Cardiff	2,345	10	0
SHEPTON & SONS, Cardiff (accepted)	2,223	0	0

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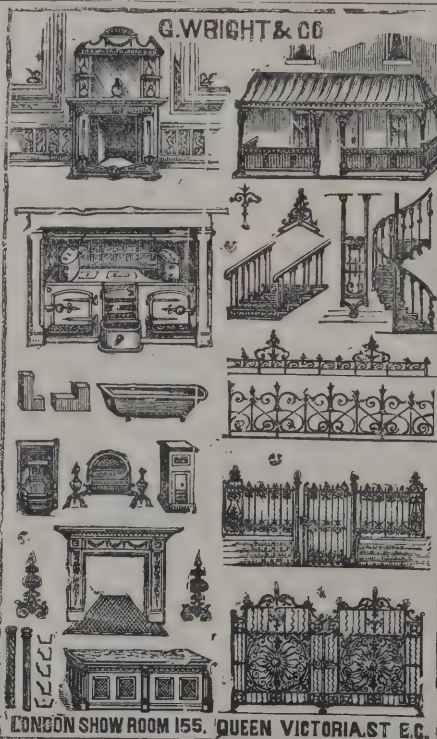
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J. Watson, Gosforth, Carnforth	285	19	9

Ireby Bridge.

W. Graves, Carlisle	689	15	0
H. Graves, Aspatria	669	15	0
J. H. Routledge, Carlisle	642	1	6
R. Johnston, Carlisle	635	1	6
T. TELFER, Langholme (accepted)	550	4	10

Kingsbridge Ford.

F. Fairless, Durham	1,569	9	0
T. TELFER (accepted)	1,003	18	4

EALING.

For Providing and Fixing at Lammas Park, Ealing, Iron Fencing and Entrance Gates, &c., for the Ealing Local Board. Mr. C. JONES, Engineer.

G. F. Darly & Co., Clapham Junction	£548	16	0
F. Morton & Co., Victoria Street	462	14	9
F. Bird & Co., Great Castle Street	444	9	10
Bayliss, Jones & Bayliss, Cannon Street	413	13	6
Rowland Bros., Fenny Stratford	408	0	0
H. S. Timpson, Ealing	398	16	9
Hill & Smith, Queen Victoria Street	386	4	0
A. & J. Main & Co., Queen Victoria Street	383	19	9
Economic Fencing Company, Billiter Street	382	18	2
G. Rowe, Lower Edmonton	382	12	0
E. J. RAYBOULD & CO., Workington (accepted)	313	13	3

FEATHERSTONE.

For Building Four Houses, Featherstone, Yorks.

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A. Fairbairn, Snaith, bricklayer	£464	19	10
G. B. Hilton, Pontefract, joiner, &c.	442	10	0
A. Fairbairn, mason	121	12	4
A. Lucas, Ossett, plumber	76	10	0
J. Allison, Castleford, slater	65	10	0
J. B. Greenwood, Heckmondwike, plasterer	63	0	0
A. Lucas, painter	16	10	0

HASTINGS.

For Construction of Two Bridges in the Parish of Hooe—one over Waller's Haven Stream between Hooe and Wartling, and one over the Water Lot Stream, for the Hastings Highway Board. Mr. J. HOOK, District Surveyor, 9 Clarence Terrace, Silverhill, Hastings.

A. King, Hollington	£170	0	0
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HANLEY.

For the Erection of Buildings and Chimney Shaft, for Electricity Works, Hanley. Mr. JOSEPH LOBLEY, M.Inst.C.E., Borough Engineer.

Holden & Myles, Stalybridge	£3,225	0	0
N. Bennett, Burslem	3,189	0	0
A. Ward, Hanley	3,085	0	0
T. Godwin, Hanley	2,999	0	0
C. CORNES, Hanley (accepted)	2,990	0	0
J. T. Clarke, Hanley (withdrawn)	2,775	0	0

LEICESTER.

For Making Danes Hill Road, Leicester, for the Leicester Real Property Company, Limited. Quantities by Mr. C. OGDEN, Architect, Welford Place, Leicester.

S. Hipwell, Wisbech	£895	0	0
S. Thumbs, Nottingham	750	0	0
J. Holmes, Aylestone	748	13	10
S. & E. Bentley, Leicester	747	7	9
J. Lea, Leicester	746	0	0
HUTCHINSON & SON, Leicester (accepted)	735	0	0
J. Bentley, Leicester	732	0	0
J. Mason, Humberstone	708	6	6

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W. WOODHAM, Lower Sydenham (accepted) £7,400 0 0

For Works of Painting at Ravensworth, West Hampstead. Mr. WALTER GRAVES, Architect.

Green & Abbott	£137	10	0
Lear	131	0	0
Audrey	109	10	0
E. Houghton & Son	93	0	0

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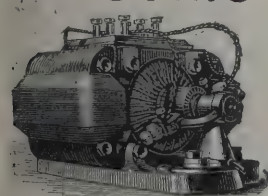
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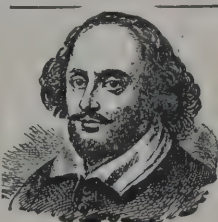
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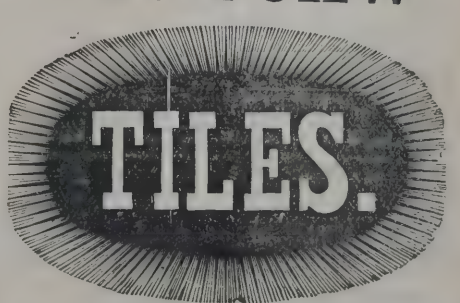
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Downs	£6,976	0	0
Smith	6,936	0	0
Grover	6,894	0	0
Bendon	6,803	0	0
Patman & Fotheringham	6,783	0	0
Lorden	6,777	0	0
Smith	6,755	0	0
Nightingale	6,738	0	0
Parry	6,590	18	0
Avis	6,560	0	0
Allen & Sons	6,065	0	0
Carmichael	6,065	0	0

For Fire-escape Bridges at Infirmary, Archway Road, for the Guardians of Holborn Union.

Shaw & Co., Cannon Street	£2,850	0	0
Potter & Sons, Oxford Street	2,499	0	0
J. F. Clarke & Sons, Moorgate Street	2,381	0	0
J. G. Jones & Co., Goswell Road	2,357	0	0
St. Pancras Ironwork Company	2,169	0	0
J. & F. MAY, High Holborn (accepted)	1,935	0	0

LOUGHBOROUGH.

For Sewage Disposal Works for the Corporation. Mr. A. W. CROSS, Borough Engineer, Loughborough.

Contract No. 1.—Supply of Cast-iron Pipes.

Birtley Iron Company	£2,889	19	2
Butterley Iron Company	2,688	7	2
J. & S. Roberts	2,372	19	9
Staveley Iron Company (extra thickness)	2,259	6	5
Oakes & Co.	2,150	13	0
Stanton & Co.	2,143	2	11
Clay Cross Company	2,128	8	2
Steel Pipe Company (for steel pipes)	2,065	0	0
Cochrane & Co.	2,098	1	11

LONDONDERRY.

For Street-lighting with 160 Arc Lamps, for the Londonderry Town Council.

Accepted Tenders.

Siemens Bros. & Co., dynamos, arc lamps, conductors, &c.	£8,905	0	0
A. Brown & Sons, engines, boilers, &c.	4,293	0	0
M. McClelland, buildings	995	0	0
M. McClelland, purchase of site	620	0	0
Opening and closing streets	300	0	0
Engineer's fees	700	0	0

MERIDEN.

For Sewerage of Village of Shustoke, for the Meriden Rural Sanitary Authority.

C. Haywood, jun., Coventry	£76	10	0
Heatherley Bros., Coventry	75	0	0
W. Moss, Birmingham (accepted)	60	0	0
J. Biggs, Birmingham	52	0	0

NEWTON-LE-WILLOWS.

For Building Manager's House at the Gasworks, Crow Lane, Newton-le-Willows.

S. Johnson, Irlams-o'-th'-Height, Manchester	£499	7	4
E. Bunting, Earlestown	409	0	0
W. Taylor, Earlestown	335	0	0
W. BEATTY, Earlestown (accepted)	320	0	0

PETWORTH.

For Alterations to Workhouse, Wisborough Green, Petworth Union. Mr. H. HOWARD, M.S.A., Architect, Littlehampton.

G. Jackson, Sutton	£846	0	0
Cook & Son, Crawley	575	0	0
P. Peters, Horsham	557	0	0
Wood & Whitcomb, Petworth	550	0	0
Hunt & Spooner, Billingham	525	0	0
Wadey & Son, Billingham	510	0	0
M. Etheridge, Horsham	499	0	0
G. AYLING, Billingham (accepted)	485	0	0

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Moorwood, Sons & Co., Sheffield	2,264 9 5	2,315 7 10
G. W. Naylor, Huddersfield	2,022 5 6	2,048 19 6
T. Tildesley, Willenhall	2,005 8 1	2,327 12 9
Phoenix Foundry Company, Derby	1,947 2 6	2,416 7 0
TOWNSEND & WATSON, Sheffield (accepted)	1,940 4 6	1,979 12 10
S. Warburton, Manchester	1,939 18 3	2,028 8 1
A. Ellis, Reading	1,908 5 9	2,217 18 1
Cleveland Bridge Company, Darlington	1,899 12 6	2,209 4 10
J. Chambers & Son, Sheffield	1,898 16 0	2,133 17 4
Workington Bridge Company, Workington	1,861 11 0	2,165 7 4
Longden & Son, Sheffield	1,853 16 7	2,163 8 11

ROTHBURY.

For Building House, Beggar Rigg, Rothbury, for Mr. Bowmaker. Mr. GEORGE REAVELL, jun., Architect, Alnwick. Accepted Tenders.

T. Muckle, Rothbury, mason	£185 0 0
W. Shotton, Rothbury, carpenter and joiner	108 10 0
T. Miller, Glanton, slater and plasterer	52 19 6
W. G. Mackay, Rothbury, plumber	23 16 10
T. H. Roper, Rothbury, painter, &c.	5 10 0

RUGBY.

For New Streets, for the Rugby Freehold Land Society. Mr. A. G. GREENHILL, Surveyor, North Street, Rugby.

Martin, Northampton	£2,680 0 0
Bentley, Leicester	2,540 0 0
Heatherley Bros., Coventry	2,457 0 0
Heap, Northampton	2,390 0 0
Cosford, Northampton	2,360 0 0
W. Hall, Rugby	2,340 0 0
H. Hewitt, Stoney Stanton	2,300 0 0
R. Finigan, Northampton	2,275 0 0
Jones & Fitzmaurice, Birmingham	2,200 0 0
F. BARLOW, Rothwell (accepted)	2,100 0 0

ROMSEY.

For Making Certain Alterations and Additions at Highwood, near Romsey, for Captain Suckling, R.N. Messrs. COLSON & SON, Architects, Winchester.

Abley, Salisbury	£3,850 0 0
Goddard, Farnham	3,695 0 0
Dyer, Southampton	3,320 0 0
GOULDING & SON, Romsey (accepted)	3,250 0 0
Wheeler & Sons, Romsey (withdrawn)	2,980 0 0

WATFORD.

For Supply of Double Gate and about 77 Lineal Yards of Wrought-iron Railing to New Retaining Wall, Aldenham Road, Bushey, for the Watford Local Board.

Pridmore, The Grange, Park Road, N.W.	£42 5 0
Cranstone, Hemel Hempstead	37 0 0
Morton, 17 Victoria Street, London, W.	32 15 0
Rogers Bros., Watford	32 5 0
H. T. Rogers, Watford	32 0 0
Mutton, Hemel Hempstead	31 3 0
Rowe, Lower Edmonton	30 0 0
W. HORTON, 62 High Street, Watford (accepted)	29 17 6

WESTON-SUPER-MARE.

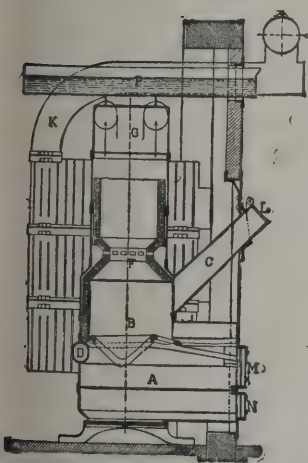
For Building House, Locking Road, Weston-super-Mare. Mr. S. J. WILDE, Architect, Boulevard Chambers, Weston-super-Mare.

T. Palmer & Son, Weston-super-Mare	£720 0 0
H. A. Forse, Weston-super-Mare	650 0 0
H. Hands, Weston-super-Mare	635 0 0
C. ADDICOTT, Weston-super-Mare (accepted)	635 0 0
A. J. Dorey, Weston-super-Mare	567 10 0

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For First Portion of Model Farm, the Crosses, Windermere, for Mr. W. Little, Chapel, Ridding. Mr. ROBERT WALKER, Architect, Windermere.

G. H. Pattinson, mason's work and walling.
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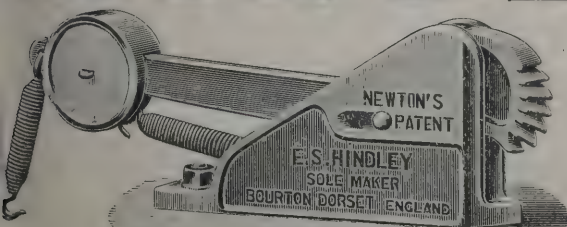
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VARIETIES.

THE Castle Mail Packets Company, Limited (Messrs. Donald Currie & Co., managers) have contracted with the Fairfield Shipbuilding and Engineering Company of Glasgow, the builders of the R.M.S. *Dunottar Castle* for the construction of another mail packet for the South African mail service, similar in character and style to the *Dunottar Castle*.

SIR CHARLES MITCHELL, K.C.M.G., the Governor of Natal, sailed by the Castle packet, *Hawarden Castle*, on Saturday for South Africa. Sir Donald Currie, K.C.M.G., M.P., is also a passenger by this steamer.

THE gift of a site for the erection of a public hall at Swinton has been promised by Canon Haywood, and a committee has been appointed to take steps for raising funds for the building. The estimated cost of the building is 3,000*l*.

THIRTY properties, having an upset value of nearly 150,000*l*., were offered for sale in the Glasgow Faculty Halls. There were sold eleven lots, realising 30,530*l*., being an increase of 1,122*l*. over the upset values.

THE committee of the Aberdeen Artists' Society are arranging for a course of lectures on art, to be delivered in the Art Gallery.

THE sub-committee of the Lord Provost's Committee of the Edinburgh Town Council, dealing with the subject of electric light, have drawn up a series of questions with the view to obtaining from Professor Kennedy additional information in supplement of his report.

A PORTION of Parr Old Hall, St. Helens, the oldest inhabited house in the district, collapsed on Saturday, the 25th, no one fortunately being hurt. According to local tradition, it was the ancestral home of Catherine Parr, the surviving wife of Henry VIII.

THE death took place on Sunday morning, the 26th inst., at his residence, Edgware, of Sir George Findlay, associate of the Institute of Civil Engineers, and well known for so many years as general manager of the London and North-Western Railway.

MR. SPEIRS, of Elderslie, has intimated to Provost Armour, of Johnstone, his intention of handing over a large field in the vicinity of that burgh to be used as recreation grounds.

THE death is announced of Mr. F. W. Smith, architect, Rochdale, at the early age of thirty-three years.

A SITE has been purchased in Willmer Road, Birkenhead, for building a new Presbyterian church at a cost of 2,500*l*.

AT the meeting of the Glasgow Architectural Association, Mr. Campbell Douglas, F.R.I.B.A., delivered a lecture entitled "Notes of a Visit to Spain and Portugal." By means of lantern slides various buildings of interest were illustrated in Lisbon, Toledo, Madrid and elsewhere, and reference made to peculiarities in design, materials, &c., of the native architecture. A number of pictures by Spanish artists from the gallery at Madrid were also shown by slide.

THE patrons of Hutcheson's Hospital, Glasgow, have agreed to offer to the Corporation of Glasgow the lands of Camphill, at the price of 63,000*l*., to extend the South Side Park, and to preserve the site of the ancient camp from which the lands take their name.

AN inquiry has been held by the Local Government Board in regard of proposals by the Corporation of St. Helens to extend the present main sewer from Ashcroft's Bridge at Parr on to the Double Locks, and construct outfall works for dealing with the sewage; for the erection of tar distillation works at the gasworks; for providing a branch library at Parr; and for the borrowing of 4,000*l*. for the erection of a smallpox hospital at Peasley Cross. The cost of the sewer and outfall works is estimated at about 25,000*l*.

AT the meeting of the Glasgow Philosophical Society, Professor Jamieson, Glasgow and West of Scotland Technical College, read a paper in which he discussed the advantages of "dry" cells over "wet" cells for bell-calls, telegraphic, telephonic and other purposes.

THE Works Committee of the Edinburgh and District Water Trust have adopted a plan and estimate and report for the construction of a regulating cistern at Craiglockhart, the estimated cost of which is about 9,000*l*. The cistern is to be 405 feet, ordnance level, and is to contain about one-third of a day's supply of water, the average supply from the North Pentlands springs being about four and a half million gallons per day.

THE umpire appointed in connection with the purchase of the London Tramways by the County Council, Sir Frederick Bramwell, C.E., has given his award, basing it on the value of the tramways as tramways, and not taking into account the

GEO. STEGMANN.

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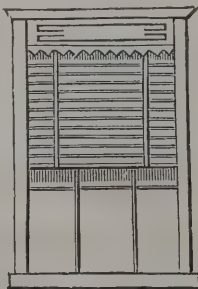
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present and future profit-earning capacity of the lines, the sum awarded amounting to 64,540l.

AT the meeting of the Birkenhead Church School Extension Committee, it was reported that the committee had received promises of 6,500l. towards the fund for providing the additional school accommodation required in the borough; a sub-committee was appointed to secure a site for a new school that building operations may be commenced as soon as possible.

THE preamble of the Perth Improvement Bill, the object of which is to enable the Perth Corporation to carry out certain street and building improvements, and to borrow 75,000l. for the work, has been passed, and the Bill ordered for report.

THE Otis Elevator Company, Limited, has been formed to acquire the business, patents and goodwill of the American Elevator Company, at present carried on in London, Glasgow, Paris, Berlin and Vienna, that company being practically the European branch of Otis Brothers & Co., of New York. It is estimated that no less than 10,000 Otis standard hydraulic elevators are in daily use in the United States of America, and a very large number are employed in Great Britain, on the continent of Europe, China, India and the Colonies.

NEW waterworks for the Norton Local Board (Malton) have been inaugurated. The well from which the supply is drawn is situated at the foot of Home Hill, and the reservoir is at the top of the hill. The water is pumped up by a Crossley gas engine at 1,000 gallons an hour, and the reservoir holds 25,000 gallons. The water is then conveyed to the town by gravitation. Messrs. Fairbank & Son, of Westminster and Driffeld, are the engineers of the work; Mr. Bell, of Market Weighton, contractor for the reservoir; Mr. Villiers, of Beverley, for the well and pumping machinery; and Mr. Millington, Driffeld, clerk of the works.

THE Brewers' Sugar Company, Greenock, have arranged to erect large fireproof works for the manufacture of cereal products in West Burn Square, Greenock, at a cost of about 10,000l.

THE Corporation of Preston having provided a site in Corporation Street for a new technical college, the Council of the Harris Technical Institution have advertised for plans for the building, which is to cost "not more than 8,500l."

THE *Coventry Herald* says:—The erection of the new baths in Priory Street by Mr. C. G. Hill for the Coventry Corporation is making rapid progress. Men are now engaged

upon the roofs, and notwithstanding the fact that some delay has been caused by the confusion that occurred in regard to the tenders for roofs, it is expected that the building will be covered in within the next fortnight.

TRADE NOTES.

THE "Baird-Thompson" system of ventilation, after having been admitted to severe tests and inquiries, has been adopted for the new lunatic asylum, Armagh, by the Irish Office of Works. The company consider that this is a valuable testimonial as to the merits of the system.

AT the annual meeting just held of the Peterhead Feuars (Merchant Hospital, Edinburgh), it was agreed to supply the tower of the free library buildings with an illuminated clock.

MR. FREEMAN, of 200 and 202 Phoenix Street, St. Pancras, N.W., is introducing into the London market Peter Hurl's Cartliston firebricks, retorts, &c., made from the celebrated fire-clay of Glencoig. Specimens of these bricks were exhibited by Mr. Freeman at the Building Trades Exhibition, and although simply taken from stock and not picked or specially manufactured samples, as is often the case in exhibitions, their clean and regular make attracted considerable attention, not only of home consumers, but also of exporters, many of whom visited the exhibition. The high quality of these fire goods is unsurpassed by any other makes. They are capable of withstanding the most intense heat without contraction or expansion. They are largely used, with economy, in the Gorman, Siemens-Martin & Bessemer steel and copper furnaces, and we have no hesitation in predicting a large and increasing trade in these fireclay goods.

BUILDING EXHIBITION.

Britannia Company.

THE Britannia Company, of Colchester and 100 and 101 Houndsditch, London, show a novelty in band saws for cutting handrail wreaths, circle-upon-circle rails, dovetails and oblique cuts of every description. A valuable feature of this patent is the table constructed to tilt and also to revolve, the name of the apparatus being the Britannia Company's patent revolving-table band saw. This was shown with other useful appliances for woodworking, planing, thicknessing and moulding machines.

GILLETT & JOHNSTON

(LATE GILLETT & BLAND),
Clock Manufacturers,
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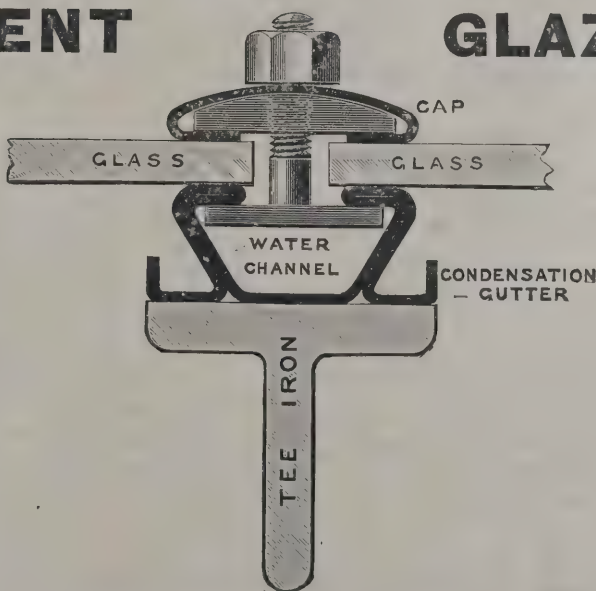
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Bradford Town Hall
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London
Sherborne Abbey
Sydney Town Hall,
N.S.W.
Durban Town Hall, S.A.
Royal Military Exhibition, &c., &c., &c.
GOLD MEDALS—H'VD, ERSFIELD, 1883; LONDON, 1885.
SILVER MEDAL—PARIS 1889

BELLS AT
Craig-y-Nos Castle
(Mad. Patti)
Eddystone Lighthouse
Birmingham Municipal
Buildings
Hove Town Hall
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Church
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J. Kelly.

Kelly's patent telescope-ladders for all purposes where ladders are required, either for indoor or outdoor use, were shown by Mr. J. Kelly, of Winchmore Hill. One of these as a long ladder can be raised and lowered by one person. Although two or more ladders are employed in this patent, they occupy the space of one only when closed. They can be stored away indoors when not in use. These ladders are raised by means of an endless cord at the side, and securely lock themselves at every step on rising or lowering. They can also be used as fire-escapes.

C. H. Freyer.

The "Excelsior" oil purifying apparatus (Freyer's) was shown by Mr. C. H. Freyer of Bermondsey, as a valuable adjunct for all engine-rooms for purifying oil already used from dirt, grit, metal filings, &c., so that the oil may be used over and over again.

Joseph Kaye & Sons, Limited.

As mentioned last week, the model of an emergency exit was shown at the stand of Messrs. Joseph Kaye & Sons, Limited, of 93 High Holborn, the idea of which originated from an architect, Mr. Jacques (Newman & Jacques, Fenchurch Street). The Board schools where it is in use belong to the West Ham and East Ham School Board district.

Electrical Wonder Company, Limited.

The exhibit described last week was, it should have been stated, under the management of Messrs. Lichtwitz & Boss, not Lichtwitz & Bros., as printed.

Among other things exhibited were rustic summer-houses, by Messrs. H. & J. Caesar of Knutsford; carriages, &c., of all varieties by Messrs. C. S. Windover & Co., Limited, of Long Acre; Messrs. H. McMullen & Son of Hertford; bamboo work by Messrs. Fisher & Sharpe of Queen Victoria Street; oils and colours by Messrs. Pinchin, Johnson & Co. of Billiter Street; a woodcarving apparatus by the Pneumatic Woodcarving Machine Syndicate, Basinghall Street; wood-working machinery by Mr. Sydney Butler, Vauxhall, &c.

Messrs. Archibald Smith & Stevens write:—In the account of the Building Exhibition in your last issue, you notice a "new" self-sustaining lift exhibited by Messrs. Pickering & Co. An earlier description of this lift may be found in our patent specification, Stevens, Major & Edwards, No. 4,240 of 1882, illustrated in figs. 11 to 13, 16, 20 to 21, 24 to 25, and 26 to 28 in various forms. The sole difference is that our patent

describes rollers, and Messrs. Pickering & Co. use balls. We exhibited these lifts at the Building Exhibition of 1883 and 1884. The rollers gave trouble by wearing into flats owing to the slight slipping at the moment of taking up the grip and releasing. Other practical defects developed in working, and the patent was allowed to lapse some years ago. It has been repatented at least four times since.

THE FALKIRK IRON COMPANY.

"FALKIRK" is the title of the large and handsome volume issued as a pattern-book by the Falkirk Iron Company, of 67 Upper Thames Street, London, E.C., a firm well known as general ironfounders and manufacturers of every description of cast-iron goods. In such a business the goods manufactured are objects of utility and necessity. The tendency of the public at the present day is to have everything inside the house, and all pertaining to the outside and its surroundings as comely as possible, and therefore architects and builders have to look not only for good workmanship and good material, but for graceful appearance in addition. We think they will concede that the Falkirk Iron Company can satisfy all these requirements. We can only allude now to necessary and useful objects—even these are so numerous and diverse that a few only can be referred to—but of course there are many goods included in the business which are daily sought after by those who are not obliged to content themselves with bare necessities. The simplest and most necessary goods in iron can be made graceful. Some railway companies by their bridges have shown it is possible to erect hideous iron structures, but the existence of railway companies is bound up with the destruction of all that is beautiful. It speaks of everyday objects of use. The Falkirk pattern-book will be found to be full of beautiful illustrations of ironwork, from small to important household objects, and also out-of-door matters. It proves that a countless variety of charming designs can be produced in iron goods, and the treatment seems exactly what the architect would look for when metal is to assume graceful forms without disguising from the eye that it is metal. Nor can anyone complain of want of variety of patterns for individual objects, the selfsame article being shown in numerous designs of great beauty. To mention a few specialties must serve to suggest the long list of other goods that might have been mentioned. For instance, among the illustrations are very

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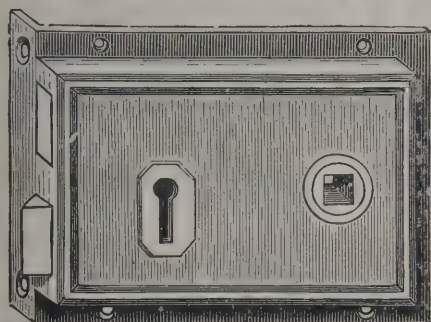
gracefully designed railings, entrance gates, palisading, balcony work and panels, verandahs, staircases of all kinds for inside or outside buildings, for gardens; spiral, &c., staircase balusters and panels, staircase castings, &c., ventilating gratings, &c. Novelties and improvements in various goods may also be noticed in turning over the pages, but throughout all an artistic spirit pervades. A large choice and variety is also shown in kitcheners, ranges, and such like goods of all kinds, meeting any requirements, from those of a cottage to those of large mansions, hotels, &c.

Thirty or more plates in the volume are devoted to illustrating these. Without attempting to allude to them in more detail, attention may be called to the combined close and open fire-ranges, fitted with handsome tile-work. One of the improved novelties is the patent "fuel-saver" range, with open or close fire. Hob or boiling tables are illustrated, improved grilling stoves, self-acting and self-setting convertible close or open fire-ranges, &c. Equal variety and choice will be found in regard of fireplaces and register grates. Whether plain or ornamented, all are pleasing to the eye, and all the improvements of modern times seem to have been incorporated in them. One that "the lady of the house" will appreciate, no doubt, is the Nursery Register grate, a perfectly designed grate, with hobs, hot-water boiler, &c. The kerbs and fenders and other fittings show again a large choice in handsome patterns. Effectiveness in another direction is seen in the numerous illustrations showing each a different application of coloured tiles to registers and grates. The canopies also have been found to give facilities for enhancing the general pleasing effect. What is rather unique in design will be found in the one named "The Acanthus" grate. Chimney-pieces are illustrated with the same profusion; and also many samples of mantel register grates, also with overmantels. A full description is given of the patent controlled combustion air-chamber heating apparatus for houses and buildings of all kinds. Illustrations are given of the apparatus, and of a series of stoves for various purposes, and also of cooking stoves. Stable fittings, rain-water goods, ornamental castings, windows, casements, &c., we have made no mention of, nor of many of the other goods that ironfounders supply. Full as the book is of all kinds of these various goods, it is a surprise the amount of space that is devoted to illustrate in so many and varying patterns each object of a class. The designs, as we have before suggested, can speak for themselves, and we have pleasure in calling our readers' attention to the book.

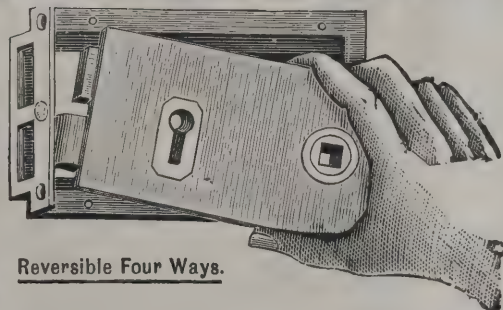
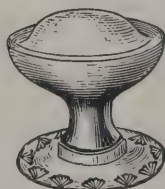
IRRIGATION AND AGRICULTURE IN EGYPT.

ON Monday Colonel Justin C. Ross delivered a lecture on "Irrigation and Agriculture in Egypt," in Glasgow. He said he had served twenty years on the irrigation works in the Ganges Canal, and when the events in Egypt in 1882 rendered English interference necessary, Lord Dufferin saw the only way to put the irrigation on a sure footing was to get men who were acquainted with irrigation among Oriental populations to take charge of the matter. His lordship sent to the Government of India for men. Colonel Moncrieff was sent to prepare a report, and following on that the Egyptian Government demanded four men from India. He was one of them, and in 1885, after serving one and a half years in the Eastern Delta as an inspector of irrigation, he took over the whole charge of the Egyptian irrigation. He pointed out that at one time the Nile was no doubt a great arm of the sea, and then explained the conditions of its flow, how that it had a tendency to throw up ridges of alluvial deposit on each side, and that if it broke through one of those ridges at a bend in its course it made another bed for itself. There were no traces of any system of irrigation found in the numerous sarcophagi that had been discovered, but it was believed that King Mena, the first king of Egypt, who flourished about 4000 B.C., was the inventor of the basin system of irrigation, which was carried on up to 1835. Having explained the system that was adopted to fill and empty the basins, and the care that was necessary in sowing the wheat immediately on the water being allowed to run off, Colonel Ross said that when the Khedives went into the European market to borrow money—and the system of payment in kind had to be abolished for that of cash—then this plan of irrigation would not do. Better provision required to be made for husbanding and buying in of the water. Under the new method they had three systems of canals. There were the low-level canals irrigating the low lands; there were high-land canals piercing the spurs on the gravel ridges from the desert, which in Upper Egypt divided the basins from each other, and they had syphons or vamped culverts, by which they passed the water underneath the low-level canals at the end of the flood into the high-land canals and filled the successive basins. It took a rise in the river of $17\frac{1}{2}$ cubits to flood all the high lands. If the river did not rise above 14 cubits there was a disastrous failure of supply. It was the result of a water famine like this that overthrew Ismail Pasha in 1877, and brought to Egypt a blessing in disguise. It was at that time

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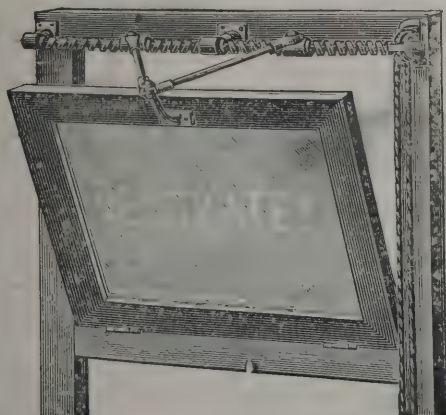
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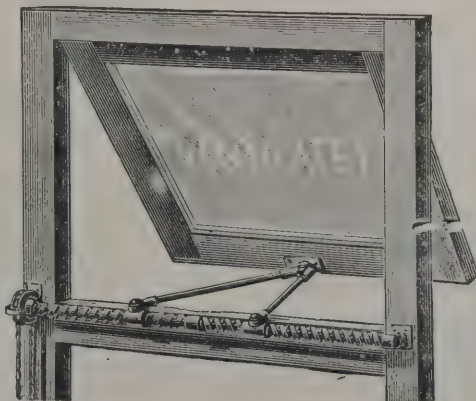
Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod on right or left side.

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that Mr. Baird, of Urie, went out to distribute the relief which it was found the Turkish governors were distributing into their own pockets. In these circumstances it was necessary to have such a hold on Egypt as would enable us to back up our engineers in their endeavours to keep the irrigation works in repair. About 600,000*l.* was the actual sum allotted for the ordinary expenditure on public works, but only 464,000*l.* was allowed for the repairs of the canals. This system of irrigation was exceedingly good so long as wheat was high in price, but America and India had cut that out, and other crops such as cotton, sugar cane and rice had to be cultivated. But the great bugbear of the Egyptian cultivator was the salt in the ground. He pointed out that during the summer evaporation took away the water but left the salt. When the Egyptian found his land getting salt the only way was to wash the soil by flooding it with fresh water, and one way of enabling that to be done easily was by the combination of the fellaheen and the proprietors to lay a certain portion under water. The lecturer then referred to the efforts that were being made for the reclamation of lands in the Western Delta and the system that was being adopted by the erection of dams in various parts of the river to secure irrigation during summer. He also referred to other schemes that had been mooted, but remarked that the carrying out of any of these depended upon the hold which this country might be able to retain over Egypt and the disbursement of its finances. He concluded by alluding to the views that were held as to Fayum being the site of the ancient Lake Moeris.

THE ARCH IN CONSTRUCTION.

THE word arch, derived from the Latin *arcus*, a bow, has been defined to be a concave structure raised upon a mould called the centreing, in the form of the arc of a curve, serving as the inward support of some superstructure, also as part of a circle less than a semicircle; as a hollow building raised upon a mould in the form of a semicircle; as a contracted vault; and as an artful disposition of stones generally in a bow-like form, by which the weight produces a mutual pressure and abutment, so that they not only support each other and perform the office of an entire lintel, but may be extended to a great width, and made to carry the most enormous weights. There being no word in the Greek language meaning an arch, it is inferred

that the object was unknown, although it has been said that the pediment of the Greeks suggested the arch, and it has been found in the Temple of the Sun, at Athens, and of Apollo, at Dydamus, concealed in the walls, covering the necessary openings, perhaps similar to discharging arches as now used by the moderns. In sacred history the arch is first mentioned in Ezekiel, chap. 40, v. 16, in his description of the Temple. "There were narrow windows to the little chambers, and to their posts within the gate, round about, and likewise to the arches, and windows were round about inwards, and upon each post were palm-trees," B.C. 574. The bridge over the Euphrates, at Babylon, Herodotus expressly says, was built on stone piers bound with lead, and lintel or squared beams of timber. The tunnels also at Babylon, mentioned by Diodorus Siculus, were probably covered in the same way. Visconti, on the authority of Plutarch, assigns the invention to Alexander himself, who lived B.C. 323, or about a century after Herodotus; Dr. Pococke thinks the Egyptians were unacquainted with the arch, although Belzoni found Egyptian arches at Thebes and one at Gouinon, leading to the valley of Beban el Malook, and Diodorus Siculus, in describing one of the celebrated buildings of Egypt, takes particular notice that it was tipped with one stone; Sir John Chardin, in describing the subterranean passages at Tohelminar, does not in any way allude to the arch, a circumstance he would not have omitted if it had been the case; one tomb is said to be arch-roofed, but it is in solid rock. The Romans have the merit of being the first to introduce the arch into general use. The earliest on record is the conduit at Tusculum, near Rome, 16 feet wide and 30 feet high. The second, the theatre of Marcellus at Rome, built in the time of Julius Cæsar, where semicircular arches are found, and it may with truth be said a genuine arch did not exist prior to the time of the Romans. The arch was not known in Greece, and there is doubt of its being used at Babylon, or Assyria, or in Rome, earlier than the time of Cæsar, B.C. 50. In the quotation given from Ezekiel probably the true arch is meant, as the impost was the earliest ornament in arches of stone, and that, too, with leaves resembling those of the palm. This would place the invention nearly 500 years previous to the time of Cæsar. Again, the absence of any remains is a great obstacle to the latter conclusion, so that we must be content to allow the merit to the Romans of bringing the arch into general use, but the extent of its application was reserved for modern times, as Waterloo, London, Gloucester, and Chester Bridges amply testify.

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There are the following forms of arches in use: the date of their introduction is almost as uncertain as the origin of the arch itself:—Tudor arch, called after the name of the reigning family; arched dome, which arose in Etruria; semi, or Roman, in exclusive use until the twelfth century; horse-shoe, or Moorish, more than a semicircle, found in East Morgan, a building of the Anglo-Normans; elliptic, first found in the tower of the Deanery of Lincoln, 1500; inverted arch, found in cathedral of Wells and Salisbury; catenarian, or arch of equilibration; scheme or skene, or imperfect arch, less than semicircle; hyperbola, and parabolic, from sections of a cone; trochoid, or cycloid, invented by Descartes, 1615; epicycloid, formed by motion of a point in a paddle-wheel of a steam boat, a combination of circular and progressive motions. There are twenty-two varieties, drawn from four, six, and eight centres. Straight arch, or plat-band, with joints converging to a common centre; examples are in Lincoln Cathedral and Greenwich Hospital. Vaulting or groins, the latter arises from the intersection of the former, about the fourteenth century. Rampant or flying arch, used to connect buttress and pinnacles with the main building.

The proportion of parts has generally been estimated in parts of the span or chord, and one-fifteenth, one-twenty-second, up to one-thirty-fourth, has been stated as the proper depth for the voussoirs at the crown or apex—the thickness of abutment one-sixth of the span, and of the piers one-sixth. The rise or versed sine should not in any case be less than one-quarter of the chord. When the height of the piers exceeds the rise of the arch, an addition of one-fifth (if their size be estimated by the previous standard) is made to their thickness, and when the span of the arch exceeds 50 feet, it is usual to increase the voussoir, as the abutment or skewback is approached. The success that attended Brunel's bold experiment of the Maidenhead bridge, carried into successful execution amid the sneers and jibes of his compeers, in the application of brick to a span for which no stone save granite was considered competent, augured favourably for the use of arches of brick to an extent never before contemplated, especially where high banks offer the additional inducement to try the effect, there being then no approaches to make. The Maidenhead bridge was turned in half-brick rings in cement, 5 feet 3 inches in depth at the crown, and 7 feet 1½ inches at the springing; the two main arches were elliptic, and 128 feet span, with a rise only of 24 feet 3 inches; the land arches 21 feet and 28 feet span, there being six of the latter on one side and two of the former

on the other. The immense mass of 7 feet in depth of brick in the arch was the true source of security.

LONDON COMMERCIAL BUILDING SOCIETY.

At the twenty-ninth annual meeting of this Society recently held at the Inns of Court Hotel, Holborn, Mr. William Hurren, chairman, presided, supported by Messrs. John Yarde, Giles Yarde, C. H. F. Lewes, J. Wear, W. F. Potter, &c. The Chairman moved the adoption of the report, which stated that in consequence of a "run" on metropolitan and other building societies, the directors deemed it prudent in September last to discontinue the society's business for two days, after which they resumed business as heretofore, with the exception of the banking department. Notwithstanding the temporary suspension of the society's business, it afforded the directors much gratification that they had been able to place a sum of 579*l.* 8*s.* 10*d.* to the special reserve fund, thus raising that fund up to 900*l.*, to write 91*l.* 12*s.* 9*d.* off the lease of the Society's premises and to recommend the members to declare a dividend of 4 per cent. per annum. The total amount of profit allotted to depositors and members for the year is 2,566*l.* 8*s.* 3*d.* The Chairman said the Society had always been eminently successful up to last year, when in consequence of the disastrous events which happened and which now were so well known, they had received a number of notices from their members. Dr. Johnson's definition of a panic was, "a fright without a cause," and the Chairman thought that there was no cause for the members to be frightened.

Mr. W. Conway seconded the resolution.

Mr. George Rayner, auditor and accountant, said he had made a thorough and searching examination of the accounts of the Society and was able to congratulate the members on the businesslike manner in which the books were kept. In his opinion the directors were fully justified in recommending a dividend of 4 per cent.

Mr. W. Simpson, auditor, endorsed all that had been said by his colleague, Mr. Rayner.

Mr. W. J. Wetenhall, L.C.C., said that the statement of the auditors was very satisfactory. He thought the directors were taking a wise step in deciding not to put the properties on the market while they were yielding a good profit. He was glad that it had been decided not to continue the banking business. At the time of the panic he gave notice for the withdrawal of his money, but after a conversation with the directors and

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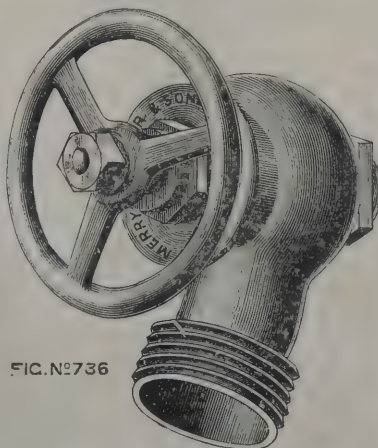
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secretary he was firmly convinced that the Society was in a sound position, and therefore cancelled the notice.

The motion was then adopted unanimously.

Mr. Pearson moved and Mr. Everett seconded the re-election of the members' auditors, Messrs. W. Simpson and C. J. Weston, which was carried unanimously, and Mr. Simpson returned thanks. The withdrawal notices had amounted to 21,000*l.*; he trusted, however, that by the middle of next June every depositor who had given notice would receive his money in full.

Messrs. W. Hurran, W. Conway, W. F. Potter and J. Wear, the retiring directors, were then re-elected on the Board.

The Chairman, in returning thanks, said he was interested in the Society to a large extent, amounting to about 6,000*l.* He felt quite confident that his money was safe.

Votes of thanks were passed to the chairman, directors, secretary and solicitors, and the proceedings terminated.

VARIETIES OF SPIRES.

THERE are many peculiarities in spires. First, as regards its base, a spire may be said to be cluster-based when surrounded below with pinnacles connected with it, and from among which it seems to spring up; of which kind St. Mary's, Oxford, is a celebrated example. The Hôtel de Ville at Ypres has a spire clustered with four exceedingly tall pinnacles or lesser spires. Where there are windows placed against a spire, rising upright like the dormers or lucarnes on a roof, the term lucarnes would express that character; hence it has been applied, among others, to those of Lichfield Cathedral, which have several tiers of such windows, and are described accordingly. Crocketed and banded are terms requiring no explanation; but in regard to the first it may be remarked that spires, otherwise quite plain, are sometimes ornamented with crockets along their edges; and with respect to bands, they are sometimes little more than string-mouldings, but in other cases broad and enriched surfaces. Many of the spires in Normandy are ornamented with such a number of bands that they form alternating courses with the plain spaces between them. Finialled is a term which does not apply to any of our English spires, but that of St. Stephen's, Vienna, and some other continental spires, have an exceedingly large and rich finial, which ornament gives them a particular boldness of expression. The

tabernacle spire also is one of which there is no example in this country, but of which the one just mentioned, and those of Strasburg, Ulm (as designed), Thann in Alsace, and many others, are specimens, the tower and spire being carried up from the ground in a succession of diminishing stages, all profusely adorned with panelling, niches, canopies, pinnacles and other tabernacle work, in such a manner that it is barely possible to distinguish where the upright portion or tower terminates and the spire itself begins, the latter seeming little more than the uppermost stage in continuation of the rest. Neither have we any instances of open-work spires, or of such as, if not actually perforated, are yet entirely covered with tracery. That at Freyburg, and those at Burgos and Batalha, are all exceedingly rich specimens of the kind. The chapter-house of Burgos also has a series of very large pinnacles or small spires of tabernacle character. Cambrai and Esslingen on the Neckar afford other examples of open-work spires. There are various other circumstances which, though they do not affect the spire itself, produce greater or less difference in regard to the character of the structure of which it is a component feature. Very much, for instance, depends upon its situation in the general plan: at Salisbury, Norwich and Chichester the spire is raised upon a tower at the intersection of the cross, or in the centre of the plan; whereas in most continental cathedrals and large churches there are two spires on the towers of the west front, though in some instances (Strasburg, Antwerp) only one has been erected. Several, however, have a single tower and spire in the centre of the west front (Ulm, Freyburg, Thann in Alsace), in which case the tower itself begins to diminish almost from the ground, and the whole becomes what we have described as of the tabernacle character. In most of our English churches (not cathedrals) the spire is placed upon a tower at the west end, as at Grantham, Louth, Bloxham, &c. If we except Peterborough, where they are very diminutive, the only English cathedral which has two western spires is Lichfield, which is further remarkable as having a central tower and spire also. Besides the richness and variety thus produced, the larger central spire serves to balance the whole composition, whereas else the body of the structure is apt to look low in comparison with the west end. At St. Stephen's, Vienna, the tower and spire are singularly placed on the south side of the edifice, it having been intended to balance them by a corresponding tower on the north side. At Gelnhausen, on the contrary, there is a group of spires, as already noticed, at the east end.

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THE ECCUP EMBANKMENT OF THE LEEDS WATERWORKS.

THE chairman of the Leeds Corporation Waterworks Committee (Alderman Alf Cooke) invited the members of the City Council, a few days ago, to an inspection of the Eccup Reservoir, where the work of reconstructing the puddle-trench is now in progress. The principal reason for the visit, says the *Leeds Mercury*, was that a contract, involving an expenditure of 26,000*l.* for further works in connection with the reconstruction of the embankment, has recently been let. The puddle-wall has now been filled in to the extent of 30 feet at the north end and of 18 feet at the south end. The difficulty arising from the presence of water, which has hitherto found its way into the trench, has been left behind at this level, and from this point to the completion the work will be more simply and more rapidly done. Pumping operations are still carried on, the water-level being thus kept below the bottom of the newly filled-in puddle-wall, so as to allow the latter to become firmly consolidated before being subjected to the effects of the water. The trench is altogether 180 feet deep. This is, for one-half of its length, some 30 feet deeper, and for the other half 105 feet deeper, than it was when originally constructed. The new puddle-trench will, therefore, have practically a level bottom throughout, whereas formerly it was of two depths—one 75 feet and the other 150 feet. The result of the excavations has been to prove that the water, whose escape rendered the present works necessary, had escaped from the reservoir under the shallow or 75 feet puddle-wall, and, finding its way to the deep puddle-wall, was gradually wearing the end of the wall away, and percolating through the remaining portion of the embankment. Indeed, it washed out of the deep puddle-wall a cavity about 100 feet long, and the cement which was employed in the effort to stop the leak ran into this cavity like a mould, spreading itself over its entire length and forming a species of wall 20 feet high, which added considerably to the stability of the embankment. Unfortunately, however, this was not the only difficulty with which the engineers had to cope. Even the deep puddle-wall had not been carried to a sufficient depth, and it was found that it was not resting on a water-bearing stratum. Hence it has had to be deepened, as before stated, to the extent of some 300 feet. It is for this reason that the further digging

out and reconstruction of the embankment has been found necessary, and the contract, which, as stated, amounts to 26,000*l.*, has been let to Mr. Gould, of Leeds, who will commence operations within the next month. When this contract is completed there will still remain a portion of the embankment that may require to be dealt with. The actual condition of this portion can only be ascertained as the progress of the excavations which, as stated, Mr. Gould will shortly commence, renders its examination possible. It is hoped, however, that with the completion of Mr. Gould's contract the trench will be finished. The great feature of the new puddle-wall is that the end of the wall, which was, under the old condition of things, worn away by the water, is now being constructed in solid brickwork right from the bottom to the top. In addition to this there is a brick-built spur, projecting 10 yards into the reservoir at a right angle from the end of the puddle-wall, and the water will have to find its way round this spur before it can get into the valley below. And should the water find its way round the spur it will leave a still surface at the embankment, which will be a great advantage. The time which the remainder of the works will occupy is variously estimated, but it is likely that three or four years will be required for their completion, and it will then take another twelvemonths to fill the reservoir. The water supply of Leeds is now being brought by temporary lines of pipes running around the reservoir into the old Blackmoor Tunnel, and thence to the Weetwood filter beds. The new Blackmoor Tunnel works are progressing very rapidly to completion, and the city engineer reports that they will be finished within six or seven weeks.

LEEDS SANITARY AID SOCIETY.

THE report of the first year's work of the Leeds Sanitary Aid Society is as follows:—The society was formed in pursuance of a resolution passed at a public meeting held in the Mayor's Rooms, on January 13, 1892, and convened by the Vicar and other gentlemen interested in the well-being of the town. It was presided over by the Mayor, and attended by a number of the most prominent citizens of Leeds, including members of the Corporation and Sanitary Committee. An executive committee was elected, under the chairmanship of the Vicar of Leeds, and this committee has met about once every three weeks, and by the courtesy of the authorities has been allowed

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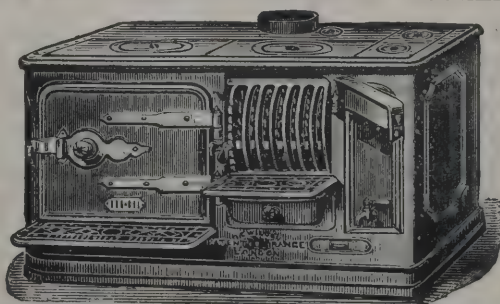
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the use of a room in the Town Hall, The first practical effort of the committee consisted of an examination and report upon the condition of 100 houses in various parts of the town, from which children had been sent into the country by the Children's Holiday Fund Committee. Following on this, one of the most thickly-populated parts of the east end of the city was mapped out into sub-districts, and almost every house in this area has been inspected by members of the committee, either personally or by deputy. Later on two further districts—one in Hunslet, and the other in Holbeck—were undertaken, but sufficient time has not elapsed to receive reports from them. In the east district 351 houses were reported to the society, of which 80 were reported to the Sanitary Committee as having distinct sanitary defects. These have been recently re-inspected, and in 21 cases remedial action has been taken; in others notices have been served upon owners, while in 17 cases the visitors report that nothing has been done. All the visitors sent in numerous complaints of smells arising from street and yard gullies. The attention of the Streets and Sewerage Committee has been drawn to this matter, and we hope that in our next report we shall be able to note that some action has been taken. We regret, however, that up to the present we are unable to learn that the pattern of gully has been altered even in the case of those newly inserted. The next fact of importance arising out of our visitors' reports was the gratifying one that in a large number of cases an external had been substituted for an internal connection with the main sewers. But your committee were much struck with the anomaly that while the sanitary authority were carrying out this improvement, the Streets and Sewerage Committee still authorised the building of back-to-back houses, with an internal connection to the main sewers, the more so as they themselves mark their disapproval of the system by insisting that no through houses shall be so built. A deputation of your committee therefore waited upon the Streets and Sewerage Committee, and received the Chairman's assurance that the views of his committee coincided with those of the deputation. Leeds is the only large town which, in England, has not taken advantage of the Infectious Diseases Compulsory Notification Act, and it was felt by your committee that the adoption of this Act by the Council would greatly strengthen the hands of the medical officer of health in counteracting the spread of infectious disease. Inquiries were therefore made in various towns, and a unanimously favourable opinion having been expressed both by the chairmen of the sanitary committees and the medical officers

of those towns, the matter was brought by deputation before the notice of our municipal sanitary authority. The Chairman informed the deputation that his committee, as a whole, was favourable to the Act, and we therefore hope to hear shortly of its adoption. The serious evils connected with the cloud of smoke which hangs over Leeds call urgently for remedy. A committee of ladies and gentlemen, formed with the object of dealing with this question, has been affiliated to your society, and on February 27 a largely-attended public meeting, presided over by Colonel Harding, was held in the Philosophical Hall, and was addressed by Mr. Herbert Fletcher, of Bolton, and Mr. Mellor, of Oldham, who explained methods by which factory smoke may be, and, in the case of Mr. Fletcher's own boilers, is being, reduced to a minimum. Mr. Ambley, the city smoke inspector, who has already done a great deal for the prevention of smoke in Leeds, visited Bolton, and expressed a most favourable opinion of the apparatus in use at Mr. Fletcher's colliery. In conclusion, the committee feel convinced there is ample room for such a society as this, which endeavours steadily to bring into notice the serious defects which still impair the sanitary condition of the city.

The balance-sheet showed receipts 22l. 3s., with expenditure 20l. 12s., a balance of 1l. 11s. thus being left.

THE BUILDING TRADES IN BIRMINGHAM.

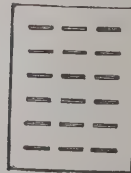
THE *Birmingham Post* says:—All who are interested in the Birmingham building trade will have a vivid remembrance of the protracted struggles which took place last year upon the wages question between the master builders and the bricklayers and bricklayers' labourers; we are, therefore, glad to learn that the even wider struggle which threatened to take place in the ensuing spring is likely to be averted. The bricklayers and labourers succeeded last year in obtaining an advance in wages, and their success has led to a demand for an increase on the part of the carpenters and plasterers, which was accompanied by an intimation from the masters of an intention to reopen the question as between them and the bricklayers and labourers. In accordance with the rules governing the various branches of the trade in their relations with the employers, six months' notice has to be given for an alteration of the standard wages list, and under this agreement the carpenters and plasterers last October gave notice that on and after April 1 this year they should expect an increase of one halfpenny per hour. The



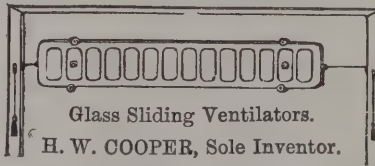
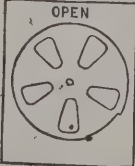
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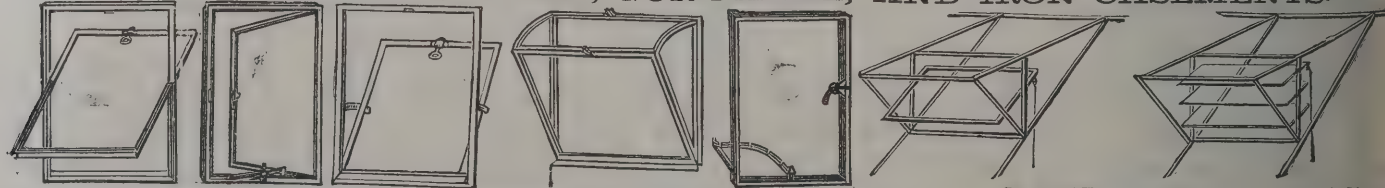
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stonemasons gave a notice in reference to an alteration of the working hours, and an intimation was made by the carpenters that they required an alteration of the period from which overtime should count. The masters, on their part, informed the bricklayers and labourers that they would be asked to consent to a reduction, lowering their wages to the level they stood at prior to the strike of 1892. At the time the notices were given considerable uneasiness prevailed as to the probable result, and it was freely prophesied that a general strike would take place. Fortunately both sides approached the difficulty in a spirit of calmness, and with a desire to arrive at an amicable conclusion. Numerous meetings have taken place in the interim, with the result that the points at issue have been reduced to such small dimensions that conciliatory means should result in their removal. So far the masters have agreed to waive their notices to the bricklayers and labourers, and, with a spirit of generosity, have, we learn, granted the increases to the carpenters and plasterers. Some dissension, however, appears to exist in relation to the question of hours and the matter of overtime, but as this is limited to one branch it is to be hoped that in the interests of an industry which is now entering upon the busiest period of its yearly activity, and considering the concessions of the masters, a friendly termination will be arrived at. Speaking generally, the building trade is not so flourishing in its prospects now as it was at the corresponding period last year, for during the winter months building operations, wherever practicable, have been rapidly pushed forward, so as to avoid the delay which would have resulted from a strike. Business will therefore be slacker than usual especially in connection with house-building, and neither party will have anything to throw away.

SALFORD DOCKS, MANCHESTER SHIP CANAL.

SOME interesting work, says the *Manchester Guardian*, is in progress at the Salford docks. Hitherto these docks have presented the appearance of simple oblong basins, shaped in granite, with walls rising to a clear height of over 30 feet. The process of filling in these empty spaces with river water has commenced. The water will have a depth of 24 feet, which is within 2 feet of the ordinary water-line to be observed when the canal is completed. The flooding to this level is merely to serve a temporary purpose, and when this is accomplished the water will be allowed to sink by some 8 feet or

10 feet. Meanwhile the docks will have the look which we shall grow familiar with at some future day. The picture, seen from Old Trafford or from the long wharf which has been built at Stretford, will be that of a great inland lake, and nearly all the masonry of the docks will be lost to sight. The immediate object which the engineers have in view is to float a couple of huge dredgers, which were constructed and put together in the shipbuilding yard of Messrs. Fleming & Ferguson at Paisley. If they had been meant for the lower portion of the canal they would have put to sea—for, clumsy as they appear, they are capital sea-boats—and sailing up the Mersey would have entered the waterway by the locks at Eastham; but having to do service at the Manchester end of the canal, it was necessary to take them in pieces and send them overland from Paisley. For the past few months the work of rivetting and painting has been in progress at the Salford docks. A hundred and more hammers have been ringing the day through, and altogether there has been noise and activity at the docks of a character to suggest a Clyde shipbuilding yard. The work being completed, the next task was to float the *Irk* and the *Medlock*—for so the dredgers are appropriately named—and that is the business which has been taken in hand. The operation is not quite the easy thing which a simple statement of the methods adopted would lead one to imagine. There are many possibilities of mishap, and what might seem a small accident may lead to serious results. The river runs its course from Salford to a point below Barton in the main channel of the Ship Canal, the diversion having been made about a year ago. The bottom of the docks corresponds with the bed of the canal, but there has been a dividing wall in the shape of a dam of earth, some 600 yards long. In view of the flooding of the docks, the dam was reduced to fine proportions, and then at two points an embrasure was made to permit the river-water to enter. Flowing in, the water would soon reach its level on both sides of the dam. In order to float the boats, however, it was essential to raise the height of the water very considerably. This has been done by shutting the sluices and closing the lock gates at Mode Wheel, about half a mile below the docks. The process has been carried out, and its practical effect was to place a dead wall at this point in the river. At a time when the rains have been heavy and the tributary streams in the higher reaches of the river send in their flood waters this course might seem somewhat risky, for strong indeed must be the barrier which could resist the flow. Even as it is, with the Irwell moving sluggishly towards the

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sea, the pressure must be enormous, and the great gates of greenheart will feel the strain, although they are fortified by water within the gates maintained at a high level. Between Mode Wheel and Salford the river rose steadily at the rate of about 4 inches an hour. Probably this standard will not be maintained. The *Irk*, which is the more complete of the two vessels, will pass through the locks at Mode Wheel, and get to work between there and Barton. The dredger *Medlock* will remove the dam at Salford, and accomplish such other excavation as is required.

It should be said that the dredgers have a complement of twelve steel barges. Each barge is constructed to carry twenty boxes, with a capacity of 4 cubic yards each, into which the dredged material is received from the shoots of the dredger. When filled the barges are taken to an adjoining wharf. By means of a patent crane the steel boxes are there lifted out, and the excavated stuff is tipped into waggons and run to spoil. This system has been in operation for some months at Ellesmere Port and Millbank. The barges are 106 feet long by 18 feet beam, with a draft when loaded of 4 feet 3 inches. They have been built by Messrs. Gilchrist & Co., of Liverpool. The dredgers which feed the barges are capable of lifting 500 tons of ordinary material in the hour. Each vessel is 132 feet in length, 37 feet in breadth, and 10 feet in depth. The engines are 350 indicated horse-power. The system of dredging in the approach channel to the Eastham Locks is of a different character to that described. Here the practice is to shoot the material lifted, whether it be semi-fluid silt or hard rock, into hopper barges. The barges are taken to sea beyond the Mersey Bar Lightship, and there they drop their loads. The Ship Canal Company have no less than ten dredgers at work, the two of greatest capacity lifting 800 tons of ordinary material per hour. All are of the "bucket-ladder" type. The following catalogue of additional plant may not be without interest for some readers:—Nine steam grabs; two steam hoppers, each with a capacity of 600 tons, three of 350 tons, and two of 140 tons; ten towing hoppers, varying from 185 to 400 tons; eighteen steel barges, each with a capacity of 120 tons, and six of 60 tons; fifty-seven wood-punts and barges; twelve steam-tugs; seventeen steam cranes; twenty-two locomotives and 550 side-tip waggons.

In connection with Ship Canal matters, it may be interesting to state that the various deviation lines recently passed into possession of the different railway companies. The Cheshire Lines Committee, having used one of the lines for goods traffic

for about a month, have opened it for passengers, altogether waiving their right to use it for six months for goods traffic only. The old Irlam Station will not see any more trains. A fine new station on the higher level has been opened. The action of the Cheshire Lines Committee will very considerably facilitate the work of the contractor and of the company.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 5362. Spencer Venables, for "Improvements in instruments for assisting drawing in perspective."
- 5439. William Wagstaffe, for "Improvements in construction of column to maintain upward air-current."
- 5559. Thomas Edwin Jones, for "Slides for all descriptions for windows to dispense with cords, pulleys or weights, applicable to anything on a sliding scale or thereabout."
- 5705. Frederick William White, for "Improvements connected with reversible sashes and in sash frames there for."
- 5835. Rowland Priest and William Morrall, for "Improvements in automatic brakes for pulley blocks and hoists."
- 5380. Henry Newman Godward, for "The anti-down-draught smoke cure."
- 5389. Arthur Bryce Mees, for "A new or improved instrument or machine for weighing and indicating the value of commodities or articles weighed."
- 5427. George Law, jun., for "Improved means for ventilating house drains."
- 5386. Marian Charlotte Pincoffs, for "Improvements in ventilating appliances for windows and the like."
- 5535. Robert Astley, for "An improvement in the construction of fireproof floors."

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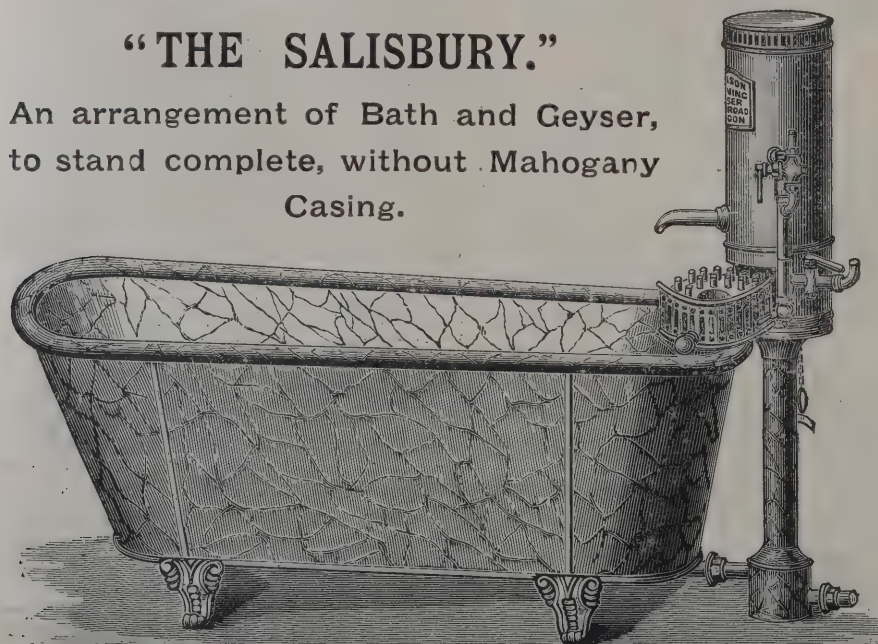
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(Machinery Section).

THE Architect and Contract Reporter.

TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITION OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

ABERAMAN.—April 13.—For Building Forty-five or more Houses. Mr. T. Rees, Swan Hotel, Aberaman.

ALCESTER.—April 12.—For Building Six Almshouses. Mr. E. H. Lingen Barker, Architect, 146 St. Owen Street, Hereford.

ARMLEY.—April 8.—For Building Two Houses. Mr. F. W. Rhodes, Architect, Upper Wortley.

ATHLONE.—May 1.—For Constructing Waterworks. Messrs. Strype & Comber, 115 Grafton Street, Dublin.

BARNLEY.—April 7.—For Enlargement of Board Schools Hoyland Common. Mr. W. J. Sykes, Architect, Hoyland.

BATTERSEA.—April 11.—For Constructing Sewers. Mr. J. T. Pilditch, Bridge Road West, Battersea, S.W.

BELFAST.—April 8.—For Building Shops, North Street. Mr. R. Watt, Architect, 77A Victoria Street, Belfast.

BRADFORD.—April 7.—For Additions to North Brook Brewery. Mr. James Ledingham, Architect, District Bank Chambers, Bradford.

BRADFORD.—April 17.—For Concrete and Brick Tar Tank, at Valley Road Gasworks. Mr. Wood, Gas Engineer, Town Hall, Bradford.

BRADFORD.—April 17.—For Building Allerton Board School. Mr. E. P. Peterson, F.S.A., 10 Exchange, Bradford.

BRIGHTON.—April 13.—For Building Public Abattoir, Supply of Machinery, Fittings, &c. Mr. Francis J. C. May, Borough Engineer, Town Hall, Brighton.

BRISTOL.—April 7.—For Building Recreation Room, Extension of Dormitory and other Works at Diocesan Training College, Fishponds. Mr. Wm. L. Bernard, Architect, 3 St. Stephen's Chambers, Baldwin Street, Bristol.

BURNHAM, BUCKS.—April 8.—For Building Two Cottages. Messrs. Sargent & Son, Architects, Wellington Street, Slough.

BURSLEM.—April 12.—For Enlargement, &c., of School Board Offices. Mr. A. R. Wood, Architect, Tunstall.

CAMBERWELL.—April 10.—For Paving Road. Mr. C. W. Tagg, Vestry Hall, Camberwell, S.E.

CANTERBURY.—April 24.—For Building Cottage for Sewage Farm Committee. Mr. F. Baker, C.E., Vernon House, Canterbury.

CARDIFF.—April 8.—For Additions to Board Schools, Stacey Road. Messrs. Bruton & Williams, Architects, 15 Queen Street, Cardiff.

CARBIS BAY.—April 12.—For Building Hotel. Mr. Silvanus Trevail, Architect, Truro.

CARLISLE.—April 12.—For Works at Meadow Brewery. Mr. A. W. Johnston, Architect, 27A English Street, Carlisle.

CASTLE RISING.—April 20.—For Building Pair of Cottages. Mr. N. Turnbull, Castle Rising, King's Lynn.

CEFN CRIBBWR.—April 10.—For Building Infant Schools. Mr. Edward T. David, 14 Wyndham Street, Bridgend.

CHARLEVILLE.—April 10.—For Building Schools at Convent. Mr. John Carroll, Architect, Cork.

CHERTSEY.—April 12.—For Construction of Sewerage and Sewage Disposal Works for Weybridge and Oatlands. Mr. W. H. Radford, Engineer, Angel Row, Nottingham.

CLAPHAM.—For Building Six Shops. Mr. J. W. Stevens, Architect, 21 New Bridge Street, E.C.

COATBRIDGE.—April 14.—For Building Post Office. The Secretary. H.M. Office of Works, 12 Whitehall Place, S.W.

CORK.—April 24.—For Works at District Asylum. Mr. W. H. Hill, Architect, Cork.

DURHAM.—April 12.—For Additions to Premises, 24 Silver Street. Mr. H. T. Gradon, Architect, Framwellgate Bridge, Durham.

EASTLEIGH.—April 11.—For Laying Pipe Sewers, with Manholes, &c. Mr. H. J. Weston, 24 Portland Street, Southampton.

FLEETWOOD.—April 19.—For Building Mission Church and Parish Room. The Vicar, Fleetwood.

FORMBY.—April 13.—For Building Police-station. Mr. W. E. Vernon Crompton, Architect, Moot Hall Chambers, Wallgate, Wigan.

FULHAM.—April 12.—For Making-up and Paving Roads. Mr. W. Sykes, Town Hall, Walham Green, S.W.

GLOUCESTER.—April 9.—For Building Subscription Rooms, Stonehouse. Mr. J. P. Moore, Architect, 9 Berkeley Street, Gloucester.

GOWERTON.—April 10.—For Building Police Station. Mr. T. Mansel Franken, Clerk to the County Council, Westgate Street, Cardiff.

HACKNEY.—April 12.—For Wood Paving. Mr. J. Lovegrove, Town Hall, Hackney, N.E.

HASTINGS.—April 10.—For Building Technical School, Manor Road. Messrs. Elworthy & Son, Architects, London Road, St. Leonards-on-Sea.

HENDON.—April 10.—For Providing and Laying Kerb, Tar and Granolithic Paving, Gullies, &c. Mr. S. S. Grimley, The Burroughs, Hendon, N.W.

HIGH HARRINGTON.—April 8.—For Building Dwelling-house. Mr. W. G. Scott, Architect, Victoria Buildings, Workington.

ILLINGWORTH.—April 11.—For Additions to Sunday School and Church Institute. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

KIDWELLY.—April 7.—For Building Parsonage House. Mr. Arnold, Stepney Street, Llanelly.

KINGSTON.—April 10.—For Tar Paving. Mr. H. A. Winsor, Clattern House, Kingston-on-Thames.

LONDON.—April 10.—For Repairs, Painting, &c., to Buildings, for Central London Sick Asylum Managers, Cleveland Street. Mr. W. S. Cross, Architect, 18 Outer Temple, Strand, W.C.

LONDON.—April 10.—For Laying-down Wood Pavement. Surveyor, Vestry of St. George's, 1 Pimlico Road, S.W.

MAIDSTONE.—April 12.—For Supplying and Fixing Boiler at Workhouse. Mr. G. Hurn, 36 Earl Street, Maidstone.

MANCHESTER.—April 7.—For Construction of Gasholder Tank, Bradford Road Works. Mr. C. Nickson, Superintendent, Gas Department, Town Hall, Manchester.

MEGAVISSEY.—April 8.—For Extension of Infants' School. Mr. W. Harris, Clerk to the School Board, Megavissey.

MORLEY.—For Rebuilding St. Paul's Church. Mr. W. Wilkinson, New Brighton, Morley.

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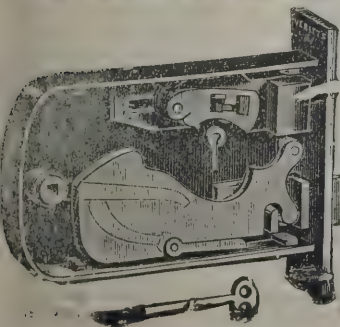
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MORLEY.—April 10.—For Building Eight Scullery Houses. Mr. T. A. Buttery, Architect, Queen Street, Morley.

NOTTING HILL.—April 10.—For Painting, Repairs and Alterations at Infirmary. Mr. J. Bedford, Guardians' Offices, Northumberland Street, Marylebone Road, W.

OSSETT.—For Building Methodist Free Church and School. Mr. Reuben Castle, Architect, Westgate, Cleckheaton.

PALMER'S GREEN.—April 7.—For Building Local Board Offices, Stables, &c. Mr. C. G. Lawson, Surveyor to the Local Board, Southgate, N.

PANGBOURNE.—April 12.—For Building Passenger Station, Goods Shed, &c. Mr. G. K. Mills, Great Western Railway Company, Paddington Station, W.

POPLAR.—April 10.—For Building Public Library, &c., High Street. Messrs. Clarkson, Architects, 136 High Street, Poplar, E.

READING.—April 11.—For Building Master's House, Grove House School. Messrs. A. Waterhouse & Son, 20 New Cavendish Street, W.

RUSHDEN.—April 15.—For Constructing Wells, Engine-house, Machinery, &c., at Waterworks. Mr. R. E. Middleton, 17 Victoria Street, Westminster, S.W.

RYE.—April 19.—For Constructing Reservoirs and Engine-house and Laying Water Mains. Mr. Charles Smith, Cinque Ports Street, Rye, Sussex.

SHALDON.—April 7.—For Building (Half-timbered Style) at Ringmore. Mr. Gualbert Saunders, Architect, Rochester Place, Plymouth.

SOUTHGATE.—April 11.—For Supplying and Delivering Glazed Pipes, Iron Castings, Broken Granite, &c. Mr. C. G. Lawson, Local Board Offices, The Green, Southgate, N.

ULVERSTON.—April 8.—For Additions to Tannery, Low Mill. Messrs. J. W. Grundy & Son, Architects, Brogden Street, Ulverston.

WALSALL.—April 22.—For Building Public Baths. Mr. H. T. Bonner, Architect, 29 and 30 King Street, Cheap-side, E.C.

WALTHAMSTOW.—April 14.—For Making-up Roads and Laying Paving. Mr. G. W. Holmes, Town Hall, Walthamstow.

WEST BROMWICH.—April 7.—For Building Laundry at District Schools. Mr. Thomas Rollason, Architect, High Street, West Bromwich.

WEST HAM.—April 10.—For Supplying Portland Cement. Mr. Lewis Angell, Town Hall, West Ham, E.

WIGAN.—For Additions to Royal Hotel. Messrs. Heaton & Ralph, Architects, King Street, Wigan.

WINDERMERE.—For Building Coachhouse and Alterations to Stable, &c., for Dr. Hamilton. Mr. Robert Walker, Architect, Windermere.

TENDERS.

ABERDEEN.

For Building Boundary Walls, Gate Pillars, &c., Woodside Public Park, Aberdeen. Mr. WM. DYACK, Burgh Surveyor.

Robertson & Cormack, Aberdeen . . . £566 8 6

ABERGAVERY.

For Alterations and Additions to Aber Clydach, for Colonel Cresswell. Mr. E. A. JOHNSON, Architect, Abergavenny.

T. S. Foster, Abergavenny . . . £1,890 0 0

J. G. Thomas, Abergavenny . . . 1,817 0 0

E. Jones . . . 1,775 0 0

W. DOWLAND, Abergavenny (accepted) . . . 1,770 0 0

ALNWICK.

For Supplying and Laying Half-a-mile of 14-inch Cast-iron Socket Pipes and Fittings, from Togston East Farm to Togston Low Hall, for the Alnwick Union Rural Sanitary Authority. Mr. M. TEMPLE WILSON, Surveyor, Alnwick.

J. Gibson, Amble, Acklington . . . £89 5 0

G. Brown & Son, Amble, Acklington . . . 81 0 0

J. Carrick, Durham . . . 80 0 0

R. Coulter, Warkworth, Acklington . . . 77 15 0

T. H. Hindmarsh, jun. & Son, Alnwick . . . 77 0 0

G. Thompson, Alnwick . . . 75 10 0

WILKIN & DICKINSON, Alnwick (accepted) . . . 75 0 0

Surveyor's estimate . . . 83 0 0

BALLYNAHINCH.

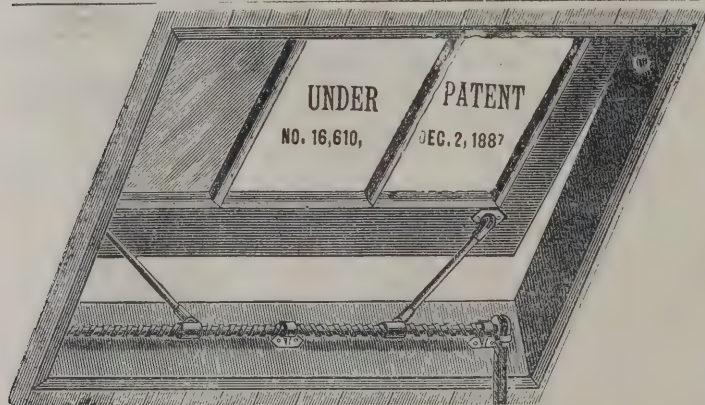
For Building Manse for the First Ballynahinch Presbyterian Church.

J. & T. Stockdale, Downpatrick . . . £995 0 0

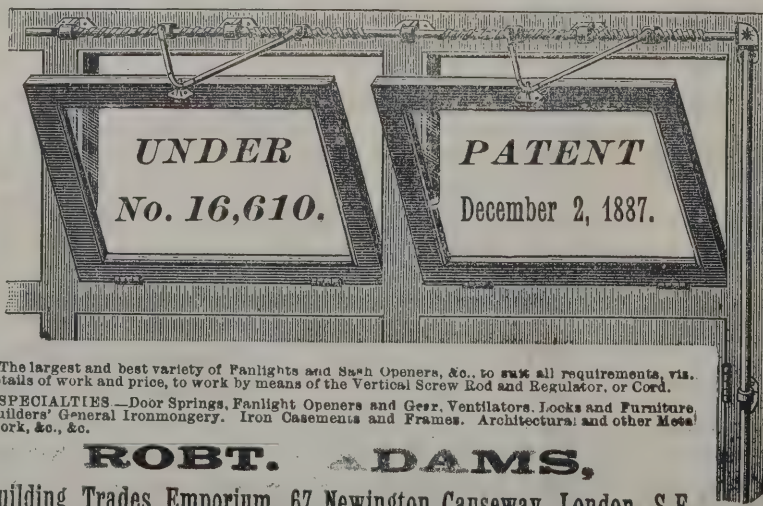
R. Reid, Ballynahinch . . . 947 0 0

A. M. Robert, Saintfield . . . 900 0 0

A. MARSHALL, Saintfield (accepted) . . . 870 13 10



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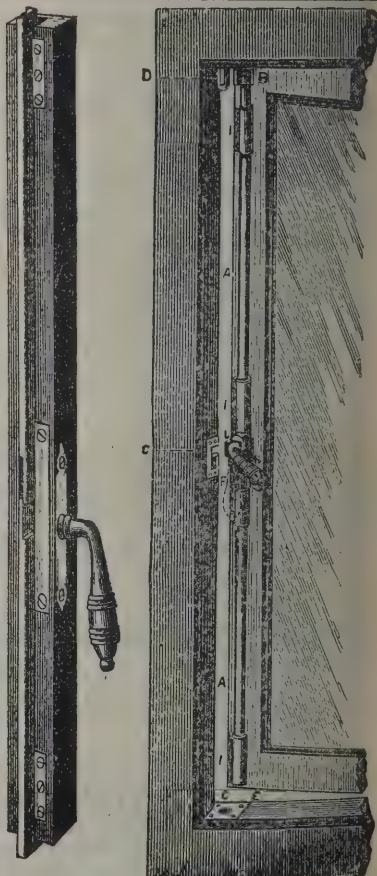
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BANGOR.

For Building Infectious Diseases Hospital, Minffordd, Bangor.	
Mr. JOHN GILL, A.M.Inst.C.E., Architect, Bangor.	
Watkin Jones, Bangor	£2,420 0 0
R. & E. Williams, Upper Bangor	2,355 0 0
W. O. Daniel, Upper Bangor	2,250 0 0
Evan Williams, Garth, Bangor	2,249 0 0

BARNSTAPLE.

For Execution of Works, for the Barnstaple Rural Sanitary Authority.

Swymbridge Drainage Works.

R. Harding, Barnstaple	£184 0 0
J. Parminter, Barnstaple	75 0 0
J. Seldon, Barnstaple	57 15 6
S. Sturgess & J. Balman, Swymbridge	45 10 9
W. Watts & J. Liverton, Swymbridge	41 10 0

Sewerage Works at Morthoe.

T. Beer, Woollacombe	450 0 0
J. Parminter	440 0 0
J. Seldon	350 10 0
H. Watts, Morthoe	272 19 0

BOGNOR.

For improvement Works, Belmont Street and Albert Road, Bognor.

H. Woods	£864 17 6
Booker Bros.	856 10 0
REYNOLDS & Co (accepted)	819 10 0

BRITON FERRY.

For Building Mixed Schools, for the Briton Ferry School Board. Mr. H. FRANCIS CLARKE, Architect, Briton Ferry.

W. John, Briton Ferry	£3,310 0 0
E. Morgan, Landore, Swansea	2,997 0 0
D. W. ROSSER, Llansamlet, Swansea	2,530 0 0
Architect's estimate	3,450 0 0

* Accepted provisionally.

BURNHAM.

For Building Pair of Villa Residences, Boundary Walls, &c., Burnham. Mr. C. S. LEECH, Architect, Boulevard, Weston-super-Mare.

A. Harding, Burnham	£710 0 0
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BURNLEY.

For Building Infirmary, for the Guardians, Burnley.

Accepted Tenders.

J. Chadwick, Burnley, plasterer	£845 0 0
J. & J. Hey, Colne, painters	425 0 0

CAMBORNE.

For pulling down and rebuilding Board Schools, Basset Road, Camborne. Mr. J. HICKS, M.S.A., Architect, Redruth.

Berryman & Delbridge, Camborne	£4,193 0 0
J. P. Berry, Plymouth	4,120 0 0
W. Stevens, Penzance	3,578 0 0
Burnett & Moyle, Chacewater	3,368 0 0
J. Julyan, Truro	3,330 0 0
S. Trehane, Liskeard	3,320 0 0
A. CARKEEK, Redruth (accepted)	3,266 0 0
J. Odgers, Redruth	3,225 0 0

COMBER.

For Rearrangement of Pulpit and Choir at First Comber Presbyterian Church, Comber.

D. McCune, Belfast	£70 10 0
A. McRoberts, Saintfield	65 0 0
J. Johnston, Newtownards	59 0 9
W. McMillan & Son, Comber	58 0 0
H. Murray & Co., Belfast	55 0 0
B. R. MCQUISTON, Ormeau, Belfast (accepted)	45 6 0

CROYDON.

For Erection of Business Premises, Park Lane. Mr. G. WARREN COOPER, F.S.I., Architect and Surveyor, Bedford Row House, Bedford Row, W.C.

E. J. SAUNDERS, Croydon (accepted)	£3,433 0 0
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DOWLAIS.

For Partly Rebuilding Dowlais Parish Church. Mr. E. A. JOHNSON, Architect, Abergavenny.

		Extra for Alternative Plan.
J. D. Williams, Knighton	£2,785 0 0	£178 0 0
E. Jones, Dowlais	2,675 0 0	175 0 0
Hatherley & Carr, Bristol	2,637 0 0	147 0 0
H. Welsh, Hereford	2,494 0 0	300 0 0
D. Jenkins, Swansea	2,443 0 0	150 0 0
W. DOWLAND, Abergavenny (accepted)	2,395 0 0	154 0 0

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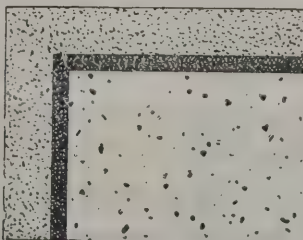
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GUILDFORD.

For Erection of Walling between the Highway and a Portion of Goal Farm, Pirbright, for the Guildford Highway Board, Messrs. PEAK & LUNN, Surveyors, 36 High Street, Guildford.

Martin, Wells & Co., Aldershot	£377	0	0
G. A. Franks, Guildford	363	10	6
J. Faggetter, Pirbright	340	0	0
R. Smith, Guildford	325	0	0
T. Swayne, Guildford	320	12	0
Tribe & Robinson, Guildford	312	18	0
[J. FAGGETTER & SON, Pirbright (accepted)	310	9	0

HALTON HOLEGATE.

For Alterations to Holegate Church, Lincolnshire. Mr. C. HODGSON FOWLER, F.S.A., Architect, The College, Durham.

Sherwin, Boston	£413	0	0
Mawer, Louth	406	0	0
RATTENBURY, Spilsby. (accepted)	283	4	0

ILKLEY.

For Reconstruction of Road and Sewerage Works, Ilkley. Messrs. SMITH, GOTTHARDT & Co., Surveyors, 15 Cheapside, Bradford.

O. Lister, Ilkley	£1,161	2	4
G. Walker, Leeds	981	0	11
R. Naylor & Son, Scholes	967	0	0
W. Farnish, Bradford	939	0	0
T. Clough & Son, Heaton	773	11	10
G. Pearson, Scholes	750	16	0
W. BARRAND, Bradford (accepted)	725	0	0

LONDON.

For Alterations and Additions at 8 and 10 Devonshire Road, Forest Hill, S.E., for Mr. W. Chard. Mr. R. CRUWYS, M.S.A., F.S.I., Architect, Bank Chambers, 465 Brixton Road, S.W.

Pratt	£805	0	0
[Carmichael	697	0	0
Balchin & Shopland	665	0	0
Wightwick & George	614	5	0
Black & Son	563	0	0
ROBERTS & Co. (accepted)	560	0	0

LONDON—continued.

For Alterations and Repairs at the Public Baths and Wash-houses of St. Giles-in-the-Fields and St. George, Bloomsbury, Endell Street, W.C. (Contract No. 2). Mr. JOHN WALDRAM, C.E., Surveyor, 13 Buckingham Street, Adelphi, W.C. Quantities by Mr. PERCY J. WALDRAM. GROVER & SON (accepted) £3,200 0 0

For New Shop and Premises, 59 Old Town, Clapham, S.W., for Mr. J. E. L. Clark. Mr. R. CRUWYS, M.S.A., F.S.I., Architect, Bank Chambers, 465 Brixton Road, S.W.

Wyatt	£1,040	0	0
Rodwell	880	0	0
Turtle & Appleton	874	0	0
CARMICHAEL (accepted)	748	0	0

For Painting, Repairs, &c., at Manchester Buildings, Golden Lane, for St. Luke's Vestry.

WM. BROWN, Godolphin Road, Shepherd's Bush (accepted) 560 0 0

Seventeen other tenders were received.

For Alterations to Shop, 232 King Street, Hammersmith. Messrs. GARRATT & STEVENS, Architects.

WM. BROWN (accepted) £118 0 0

Two other tenders received.

NEWTYLE.

For Water Supply and Drainage Works at Newtyle, Forfarshire. Mr. J. YOUNG, Engineer, Perth.

J. Adam & Co., Dundee	£2,298	0	0
W. G. Flett, Glasgow	2,094	3	6
J. Gray & Sons, Newtyle	1,999	2	1
J. Cowie & Co., Dundee	1,961	14	6
D. & R. Taylor, Perth	1,923	18	10
Mitchell & Baud, Dundee	1,923	9	2
R. C. Brebner, Edinburgh	1,916	6	7
J. MacLeish, Perth	1,841	12	0
Asborne & Stevenson, Ayr	1,830	14	0
J. Melloy, Perth	1,824	3	0
C. MacKay & Son, Crieff	1,816	11	4
A. Perrie, Fochabars	1,785	8	2
Bain & Co., Dundee	1,760	0	7
J. SCOTT, Garelochhead (accepted)	1,513	12	7
W. Frew & Sons, Perth (water only)	1,025	0	0
P. Irvine, Perth (drainage only)	840	2	7

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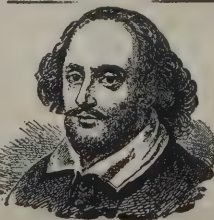
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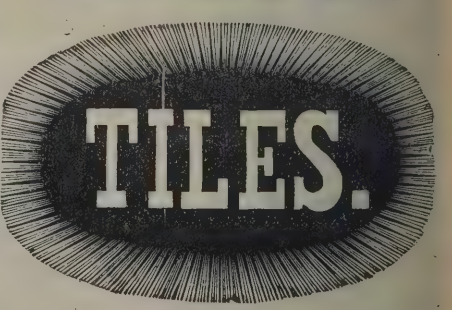
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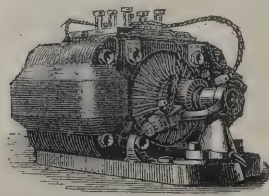
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Evan Jones, Dowlais £11,025 0 0
John Williams, Castle Street 9,180 0 0
David Davies, Brithdir 8,415 0 0
Wm. Lissaman, jun., Chipping Campden 8,322 0 0
John Jones, Merthyr 8,055 0 0
Samuel Hawkins, Merthyr 8,010 0 0
RICHARD LLOYD, Cefn Coed, Merthyr (accepted) 7,605 0 0

SALE.

For Construction of Sewers from Sewage Purification Works to the River Mersey, with necessary Manholes, &c., for the Sale Local Board. Mr. A. G. M'Beath, Engineer.
P. Smith, Sale £872 6 10
W. Hughes, Hulme 761 0 0
W. H. Pickin, Davenham 510 0 0
R. Lomax, Eccles 470 0 0
G. Bozson, Ashton-on-Mersey 390 0 0
W. BARTON, Bowdon (accepted) 371 3 6

SEDGEFIELD.

For Building House for Medical Superintendent at the County Asylum. Mr. WILLIAM CROZIER, County Architect, Durham. Quantities by Mr. J. EZRA MILLER, 1 Tunstall Road, Sunderland.
T. Dickinson, Middlesbrough £3,330 0 0
W. C. Atkinson, Stockton-on-Tees 3,134 18 7
J. Elliott, North Shields 3,115 0 0
J. Johnson & Son, Middlesbrough 3,096 11 3
J. G. Gradon, Durham 3,055 1 7
T. Hunter, Washington 3,001 13 9
M. R. DRAPER & SON, West Rainton (accepted) 2,896 13 9

SALISBURY.

For Building Engine-house, Boiler-house and Coal Store at the new Waterworks, Wyndham Road, Salisbury. Mr. J. C. BOTHAMS, City Surveyor.
J. WORT, Salisbury (accepted) £755 7 8

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For Building Church of St. Peter, Abbeydale, Sharrow, Sheffield. Mr. JOSEPH NORTON, Architect, Alliance Chambers, George Street, Sheffield.

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John Chambers & Sons, Sheffield	4,985 0 0	5,600 0 0
L. T. Wildgoose, Matlock	4,914 0 0	5,384 0 0
John Arnold, Sheffield	4,854 0 0	5,338 0 0
William Ives & Co., Shipley	4,740 0 0	5,266 0 0
Samuel Warburton, Manchester	4,700 0 0	5,245 0 0
Dutton & Evans, Sheffield	—	6,695 0 0
<i>Masonry only.</i>		
William Ives & Co., Shipley	3,550 0 0	4,020 0 0
L. T. Wildgoose, Matlock *	3,499 0 0	3,899 0 0
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John Lister, Rotherham	—	4,215 0 0
Joseph Mastin & Sons, Sheffield	—	4,350 0 0
John Morton, Sheffield	—	4,499 0 0
J. Richarby, Sheffield	—	5,100 0 0
* Tender for masonry only at 3,499/ accepted for the present.		

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For Construction of Disinfecter-house and Bath-rooms at Infectious Diseases Hospital, Dailstone Lane, for the Sanitary Committee. Mr. JOHN ATKINSON, Borough Surveyor, Stockport.
T. Hoe, Stockport £473 10 0
J. Broadhurst, Stockport 467 0 0
BROADHURST & MAYER, Stockport (accepted) 450 10 0

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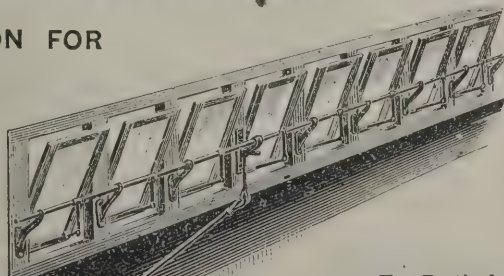
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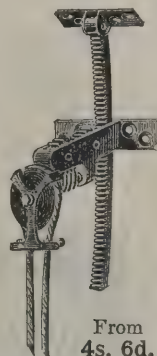
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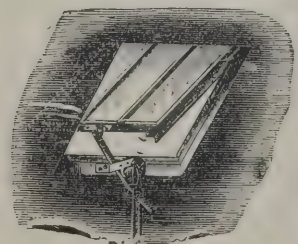
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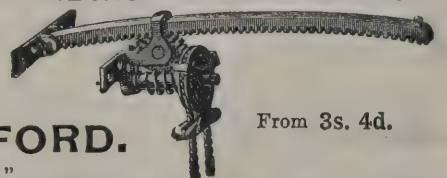
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For Road Works, &c., at New Town, Rusthall, Speldhurst, Kent, for the Guardians of Tonbridge Union. Mr. W. OAKLEY, Surveyor, 36 Mount Pleasant, Tunbridge Wells.

W. Coker, Halling	£1,488	7	5
J. Bowles, New Wandsworth	1,455	0	0
R. G. Truby, Chatham	1,404	10	6
W. H. WHEELER, Southwark (accepted)	1,341	12	10

TIPPERARY.

For Construction of Works of Water-Supply, Tipperary, for the Guardians. Messrs. W. G. STRYPE & P. F. COMBER, Engineers, 9 Anglesea Street, Dublin.

H. & J. Martin, Dublin	£12,500	0	0
J. Cunningham, Dublin	11,998	0	0
J. Edmondson, Dublin	11,850	0	0
T. J. Dixon, Dublin	11,150	0	0
M. Walsh, Foynes	10,840	0	0
R. Simpson, Dublin	10,053	0	0
E. W. Finn, Charleville	9,290	7	0

TYNEMOUTH.

For Construction of Stone Bridge over Seaton Burn, Seaton Sluice, for the Tynemouth Union Rural Sanitary Authority. Mr. JOHN WATERS, C.E., Engineer, Longbenton. Quantities by Engineer.

J. L. Miller, Tynemouth	£3,629	0	0
G. E. Simpson, Newcastle-on-Tyne	3,621	1	5
J. Taylor, Earsdon	3,372	7	4
J. Elliott, North Shields	3,170	0	0
J. White, Newcastle-on-Tyne	2,695	0	0
G. H. Manchlin, Newcastle-on-Tyne	2,649	1	6
T. Weir, Howdon-on-Tyne	2,529	3	6
W. Kidd, Middlesbrough	2,498	0	0

WITHINGTON.

For Laying Pipe Sewer, Albert Road, Withington. Mr. A. H. MOUNTAIN, Surveyor.

M. Naylor, Manchester	£354	15	6
Worthington & Pownall, Manchester	300	0	6
Barker & Harris, Stockport	299	4	6
G. Clarke, Manchester	258	3	0
W. Bailey, Withington	249	7	0
J. Farrell, Rusholme	230	0	0
A. GODDARD, Withington (accepted)	196	0	0

WESTERHAM.

For Carrying Out Drainage Works, Westerham. Mr. HENNEL, Engineer.

E. Martin, Westerham	£505	10	0
Durnell, Bristed	450	0	0
CUNLIFFE (accepted)	415	0	0
Engineer's estimate	375	0	0

WOLVERHAMPTON.

For Building Mortuary, &c., at the Borough Hospital for Infectious Diseases, for the Town Council. Mr. R. E. W. BERRINGTON, Borough Surveyor, Wolverhampton.

Cave	£199	0	0
Skett	193	0	0
H. GOUGH (accepted)	174	0	0

TRADE NOTES.

THE Nuneaton Cottage Hospital is being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

MR. THOMAS YEOMAN, of Osmotherley, has placed a large memorial clock, with all the latest improvements, in the tower of the parish church, in memory of his father. The clock shows the time on a large outside dial, which is painted and gilt, and strikes the hours on the large bell and the quarter-chimes on two smaller bells. The necessary work has been carried out by Messrs. Wm. Potts & Sons, of Guildford Street, and Cookridge Street, Leeds.

THE judges of the Universal Exhibition, Monaco, have awarded the Yost typewriter the gold medal and diploma.

THE Ashchurch Schools, near Tewkesbury, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE Edinburgh School Board adopted a report submitted by Mr. Ballantyne with the following estimate of the probable total cost of providing the Bruntfield School and site, &c.:— Estimate of Messrs. Moodie & Co. for the mason, brick, joiner, iron, slater, glazier, plumber and plaster works, &c., 21,479*l.*; estimate of Messrs. Mackenzie & Moncur for heating and ventilating and providing chimney and boiler-house, 1,702*l.* Probable estimates:—Furniture and fittings, &c. (as per

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schedule), 1,075*l.*; painterwork, 450*l.*; extra work, legal and incidental expenses, say, 1,204*l.*; surveyors' fees and lithographing, say, 300*l.*; architect's commission at 3 per cent. and salary of clerk of works, say, 1,090*l.*—27,300*l.*; cost of site, including expenses already incurred, 5,700*l.*; total probable cost, 33,000*l.*

WE have received some new illustrated catalogues and price lists from the Edison & Swan United Electric Light Company, Limited, which will be referred to more at length in a following issue. They include lists dealing with incandescent lamps, installation fittings for electric lighting and electric light measuring instruments, and which we can recommend for perusal to any interested in works pertaining to the use of electric light.

VARIETIES.

THE first of a series of lectures under the auspices of the Aberdeen Artists' Society has just been delivered by Mr. W. M. Gilbert, of Edinburgh, the Marquis of Huntly presiding. Mr. Gilbert treated on the rise and development of French art, which showed them that they could not at once rise to be an artistic nation, and could not hope in Scotland and England to rise to the level of France in a moment, but it also taught them that it was education, learning, thought, study of nature, not condemnation of impressionism, and not the run after romanticism in all its various forms, but it was the study of nature and the love of art that produced artistic ideas.

TWO of the British Royal Commissioners, Mr. James Dredge and Mr. H. Harris, sailed for Chicago on Wednesday in the interests of the British section of the coming exhibition, and to attend the opening. It is believed that Sir Edward Birkbeck and Sir Douglas Galton will also go to Chicago later in a similar capacity.

WE understand that Mr. Santo Crimp, M.Inst.C.E., has resigned his appointment of district engineer to the London County Council, and has entered into partnership with Messrs. John Taylor & Sons, civil engineers, of 27 Great George Street, Westminster. Mr. Crimp is a recognised authority on all matters relating to municipal engineering, is the author of many papers on sanitary engineering, and of a standard work on sewage disposal, while his partner's were for a long time connected with two of the London water companies, and have for a number of years past acted for many of the provincial

water companies; they are also authors of a well-known work on the discharges of water-mains.

A SUBSIDENCE, due to mining operations, occurred in Belper Row, Darby Hand, Netherton, near Dudley, on Friday night, with the result that four tenanted houses were seriously damaged, and one, also occupied, completely wrecked. Subsequently another house has begun to collapse, the tenants speedily evacuating the premises.

THE municipality of Havre, in concert with the medical authorities, are organising an international sanitary exhibition.

AN electric pumping plant with a capacity of 2,000,000 gallons per twenty-four hours is to be started at the San Antonio Waterworks, Texas, by the Gould Manufacturing Company, of Seneca Falls, New York. The pumping plant is to be increased to 10,000,000 gallons daily capacity, and current will be generated at a point three miles distant, where water-power is available.

A COMPANY at Naples are preparing a mosaic, representing the return of Columbus to Spain, for Mr. Furber, of Chicago, who is building in that city a Columbus Palace, and which will be the largest private house in America. The mosaic measures about 200 square feet, and is designed by Cavaliere E. Paoletti.

JUDGMENT has been given by Sheriff Campbell Smith in an action by Mr. James Sime, house agent, Laurel Cottage, Queen Street, Broughty Ferry, against an order by the Dundee Police Commissioners that he should put a house in Brown Street, Dundee, belonging to him, in a sanitary and habitable condition. His lordship finds that the deliverance by the commissioners cannot be sustained, and finds the appellant entitled to expenses, modified to 3*l.* 3*s.* In a note his lordship says his condition is that there are thousands of worse houses than this one in cities in Scotland, and that in the country districts the majority of houses inhabited by working men and their families are not so good. Overcrowding, want of accommodation to secure the decencies of life, want of means of cleanliness, were all great evils that ought, as far as possible, to be cured, but they would never be cured by shutting up houses that were not intolerably bad or unhealthy.

THE works for the new water supply of Haddington have been commenced. The new scheme will more than double the present supply, and the town will be indebted for this to the Marquis of Tweeddale, who has met the burgh in the most generous manner. The distance of the pipe track will extend to over six miles, and the estimate accepted for the cutting of

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the track is 2,193*l.* 14*s.* 6*d.*, the contractors being Messrs. John M'Knight & Son, Uphall, Linlithgow. The difference between the highest and lowest offers was 1,400*l.*

THE *Manchester Guardian* says:—We learn that the works in connection with the electric lighting of Moss Side will be begun in the course of the next few days. The local authorities hope to have the new light in the Whalley Range residences as well as in the principal shops and streets by next winter. A telephonic exchange will shortly be established in the township.

THE joiners of Colne have gone on strike, the masters refusing an advance of wages from 7*d.* to 7½*d.* per hour.

AT the meeting of the Preston Town Council a recommendation of the Town Improvement Committee that certain property on the north side of the market-place should be purchased for 9,000*l.* was confirmed. This was the last purchase necessary to entering on the work of public improvement, and the committee would not lose a day in entering upon it. The Ribble Committee decided to purchase a sand-pump similar to those in use at the Mersey bar for 1,295*l.*; to construct a siding on the north side of the dock at a cost of 1,200*l.*, and various other works.

FOUNDATIONS OF THE TOWER BRIDGE.

AT the ordinary meeting of the Institution of Civil Engineers on March 28, 1893, a paper was read giving an account of the methods adopted in the construction of "The Foundations of the Two River Piers of the Tower Bridge," by Mr. G. E. W. Cruttwell, M.Inst.C.E.

Owing to the weight of the lofty towers supporting the suspension-chains of the shore-spans and the high-level footways over the opening span of the bridge, the dimensions of the foundations, with a load of 4 tons per superficial foot, worked out to 100 feet in width by 204½ feet from end to end of the cut-waters. This large area was excavated by sinking four caissons, each 28 feet square, on the north and south sides of each pier, with two triangular-shaped caissons at each cut-water. The twelve caissons of each pier were all spaced 2 feet 6 inches apart, and enclosed between them a rectangular space, 34 feet by 124½ feet, in the heart of the pier. This was not excavated until the permanent work forming the outer portion of the pier had been built continuously within the

caissons and in the narrow spaces between them up to the level of a few feet above high-water. This method was cheaper and was attended with less risk than that of using larger caissons extending across the pier.

The caissons consisted of a single skin of wrought-iron varying in thickness from ½ inch at the bottom to ¼ inch at the top. The skin was supported every 3 or 4 feet in height by pitch-pine frames, with diagonals of the same material across. The joints of the removable portions were made watertight with indiarubber. The bottom section of each caisson was erected on a temporary platform fixed a short distance above low-water. Two pairs of trussed-beams were placed above the caisson, with their ends supported upon the staging on either side, and four 2½-inch rods passed between the beams, and were connected to the caisson near each corner. The rods were screwed at the top for several feet, and, by setting up the screws, the caisson was slightly lifted, whilst the platform was cleared away from beneath. The caisson was then lowered down on to the bed of the river and the excavation was commenced. Divers and grab-machinery were employed at first; but, as the ground consisted of the London clay, it was only necessary to sink the caissons some few feet beneath the river-bed, when the water could be pumped out of them, and the excavation continued in the dry.

The reliable nature of the clay rendered it possible to undercut beneath and beyond the bottoms of the caissons, whereby a considerable saving was effected in contracting the limits of the caissons within the outside line of the foundations. The undercutting was timbered with 1½-inch poling-boards, strutted back with timber props against the bottom of the foundations. By executing the undercutting in sections and quickly filling in the concrete as soon as the excavation of each section was completed, the danger that was liable to arise from any serious swelling of the clay was much diminished. After two adjoining caissons had been sunk and partially filled with concrete, the space between them was enclosed by driving piles in grooves specially provided at the corners of the caissons. This allowed the adjoining sides to be removed and the intervening space to be excavated and concreted up, thus converting the two caissons into one. By repeating the process a continuous caisson surrounding the heart of the pier was obtained. Within this the outer portion of the pier was built to a height of 4 feet above Trinity high-water, thus forming a cofferdam to exclude the tide from the inner portion of the work. When the latter had been pumped out and excavated the inner



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sides of the caissons were taken out and the heart of the pier was filled in. The whole work was bonded together by numerous dovetails in the concrete and by toothings and rackings in the brickwork.

The materials in the two piers, from foundation-line up to a level of 4 feet above Trinity high-water (a height of 60 feet), consisted of 25,220 cubic yards of cement concrete, 22,400 cubic yards of brickwork in cement and 3,340 cubic yards of Cornish granite, making a total of 50,960 cubic yards. The cost of the same, including all subsidiary items, such as stagings, caissons and excavations, amounted to 111,122*l.*, so that the average cost of the construction was 2*l.* 3*s.* 7*d.* per cubic yard.

THE TOWER BRIDGE.

THE Lord Mayor presided at the last of the present series of lectures arranged by the Carpenters' Company on matters connected with building, when Mr. J. Wolfe Barry, C.E., delivered a lecture on the Tower Bridge. The Chairman, in briefly introducing the lecturer, congratulated him on having solved a difficulty which had been looked on as insuperable by his great predecessor, Brunel. Before proceeding to describe the present bridge, the lecturer touched shortly on the various bridges which exist or have existed in London, dealing with the necessity for their erection and the suggestions which had at various times been made to meet the want. He traced the history of London Bridge from about the year 1000 to 1758, when the last was seen of the old bridge with its curious buildings, and spoke of the various suggestions made for connecting the northern and southern banks of the Thames below London Bridge, when the necessity for such an arrangement became pressing. He then traced the history of the present bridge, a Bill to erect which was promoted by the defunct Metropolitan Board of Works without success, the Bridge House Committee taking the matter in hand in 1885, and bringing it to a successful conclusion. There were however difficulties, the chief of which was the insertion of a clause in the Bill which insisted on the maintenance during construction of a central waterway of 160 feet, thus necessitating the removal of a portion of the works of one pier before the other could be taken in hand, a fact which will explain some of the delay in the completion of the bridge. After an interesting account of the construction and sinking of the caissons within which the foundations of the

central piers were laid 102 feet below high-water mark, the lecturer described the remarkable works within those immense structures. Each of the leaves of the movable central bridge weighs, he stated, with its counter-balance, 1,045 tons, and moves on a pivot of steel 48 feet long and weighing 25 tons. The counter-balance moves in a large chamber, quadrant shaped, within the pier, within which is also contained the powerful actuating hydraulic machinery worked from the water towers at each end, by which the enormous leaves can be raised or lowered in one minute and a half. These leaves are to be fitted with lights for the information of approaching ships at night—four red lights signifying that the bridge is closed and four green lights that it is open. The hydraulic machinery, which was, he stated, the most powerful in the world, also works the lifts to the foot-bridge, 140 feet above high-water mark, for use when the main bridge is open. He stated the gratifying fact that the loss of human life during the seven years since the laying of the foundation stone had been less than might have been anticipated, six lives only having been lost. In conclusion, he ventured to predict that after the lapse of a time which he did not attempt to estimate, as the water traffic declined—as it naturally would do—and the land traffic augmented, the central span of the bridge would cease to be utilised as a movable structure. He paid a well-deserved compliment to his colleagues in the great work, which he said would cost considerably over a million, and hopefully anticipated that it would be complete and open for traffic before the conclusion of the present year. A vote of thanks to the lecturer closed the proceedings.

THE REBUILDING OF GLASGOW BRIDGE.

THE initial steps are now being taken with a view to the erection across the Clyde at the Broomielaw of the new bridge which has been so long in contemplation. The present structure, which will shortly be demolished, says the *Glasgow Herald*, was built of granite at the beginning of the century from plans prepared by Telford, the celebrated architect and engineer. It has served its purpose well, and its end has been decreed owing to the growth of the trade of the city, the consequent increase of cross-river traffic, and the alterations in the levels of the bed of the river resulting from the development of the harbour. Many schemes were proposed with the view of improving the old bridge. It was thus suggested that

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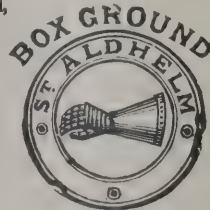
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the structure should be strengthened by the foundations being underbuilt, and that the roadway might be widened. These proposals, however, have not been acted upon, and the Corporation some time ago resolved to erect an entirely new bridge. Plans for this purpose have been prepared by Messrs. Cunningham, Blyth & Westland, C.E., Edinburgh, and have received the approval of the Town Council and the Clyde Trust. The work of erection has been entrusted to Messrs. Morrison & Mason, Glasgow, the well-known contractors. As it was impossible to divert the enormous amount of traffic which crosses the Clyde at this point, it has been found necessary to build a temporary service bridge for use during the erection of the permanent structure. Messrs. Morrison & Mason, acting under the direction of the engineers, began the work of erecting the temporary bridge about the middle of December. Considerable progress has already been made, and it is expected that the works will be completed by the end of July, when the removal of Telford's masterpiece will be proceeded with. The temporary bridge is being built of wood and steel, with a roadway 60 feet wide, the same width as that at present available for traffic. It will consist of seven piers, each composed of thirty timber piles driven into the bed of the river in rows of thirteen. These piles will be firmly braced together by joists, wales, runners and diagonals. On the top of the piers will be placed timber girder-bearers carrying thirteen steel-plate girders. The principle adopted in the construction of the bridge is the cantilever system, similar, though of course on a much smaller scale, to that applied in the building of the Forth Bridge. Perhaps it would be more correct to put it that the staging for driving the piles is on the cantilever principle, that is to say, the steel girders are projected from a pier, and on the top of these girders are placed the contractors' cranes for driving the pier in advance, so that no temporary staging in the river is required. This plan, which is being used for the first time in connection with pile-driving, obviates the necessity of obstructing the progress of the Clutha and the other harbour traffic. The piling machine is placed at the end of the jib of the crane and is held in position by means of guys and spars, and it drives the piles into proper position. Of the seven piers four are already nearly finished. In order to suit the different waterways of the existing and the new bridge two of the piers will not be parallel up and down the river, one of them being wider at the west end and the other at the east. The wooden runners are bolted on to the top of the steelplate girders, and on the runners

are nailed two thicknesses of 3-inch planking, which are placed at an angle in order to strengthen the bridge. Over the planking, which is perfectly close, there will be a layer of asphalt, and then the causeway-stones and tramway rails are laid on a thin layer of sand, so that the bridge, though only a temporary structure, will have the appearance of being more substantial than it really is. The parapets will be made of timber. To avoid inconvenience to traffic, which it is anticipated would ensue by the public watching the operations when the permanent bridge is in course of construction, the parapets will be made high, forming an impervious screen. The greater part of the traffic, it is expected, will be on the west side, and to cope with this the footpath will be made half as wide again as on the east side—the breadths being respectively 12 and 8 feet. While the permanent bridge is being erected and the waterway blocked at the north side, the waterway at the south span will be dredged at the temporary bridge, in order that the river traffic may be allowed to pass. The operations will cause very little inconvenience to the tramways. On leaving Jamaica Street, the track will curve round to the east and run along Great Clyde Street, and after crossing the bridge they will enter Bridge Street from Carlton Place. The temporary bridge is to cost about 14,000*l*.

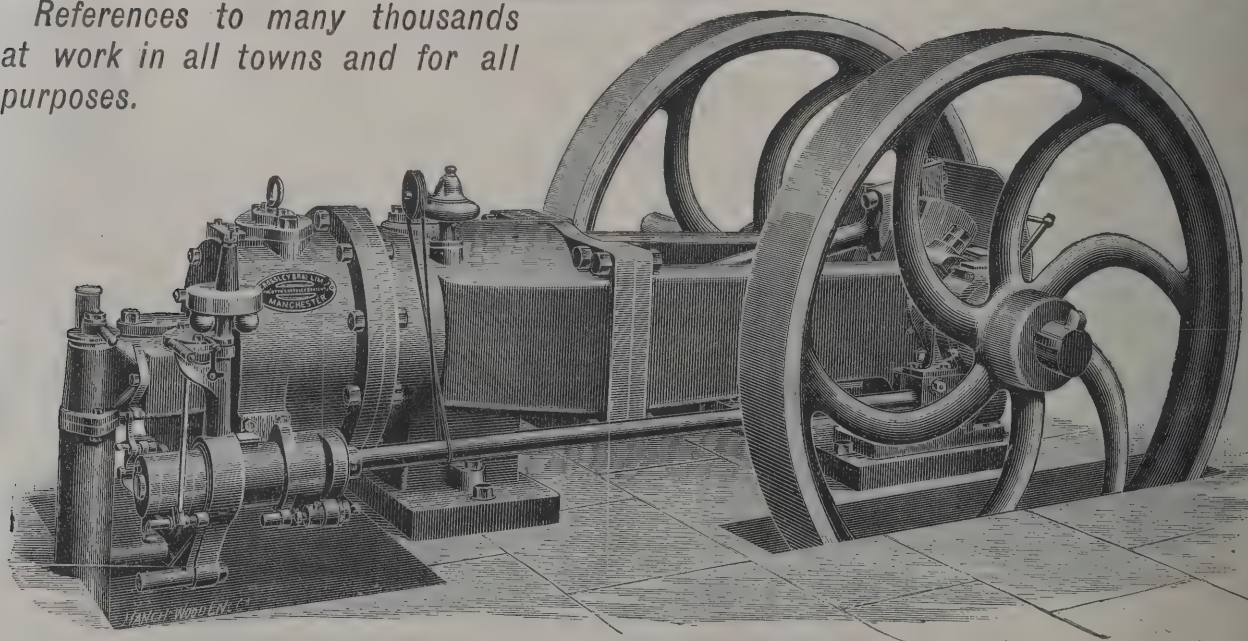
THE AMERICAN UNIFORM CONTRACT SCHEME.

THE following report on the efforts to secure uniformity of contract in America was presented by the secretary at the St. Louis Convention of Builders:—

The valuable work of the National Association, the "Uniform Contract," has lately received an unusual amount of attention in several directions. It has been noticeable that for some reason or other, probably because of the continued agitation of the subject from this department, assisted by the efforts of individual members of the local bodies, a new and widely scattered demand for the document has developed, not in large quantities but for single copies as specimens and from all parts of the country, particularly in places not within the affiliation of the National, even as far away as Salt Lake City in Utah. Interest in this form manifests itself also in renewed criticism, which is most welcome, for such examination denotes a consideration of the method proposed, which in itself acts as an advertisement, and if intelligently applied will be productive of a clearer apprehension of its purpose and larger

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use. There has, however, been one attempt to supplant or at least weaken the authority of the form, which calls for special comment, inasmuch as it emanated from a constituent body of the American Institute of Architects, the association which has joined with us in preparing and recommending this document for general use.

The Boston Society of Architects, ignoring the fact that it is a chapter of the American Institute, and also that at the annual convention of that body held in Boston in the fall of 1891, in which it participated, the acts of the joint committee on uniform contract were approved and the committee continued, proceeded, very soon after the said convention, to prepare, in consultation with legal advisers, a close but most inconsequent criticism of the standard form, distributing the same with a certain "suggestive form of contract" to its members, advising them to still follow their individual preferences in the matter of contract forms, rather than use the form regularly and properly approved by the National Association representing their profession. Now there can be no possible objection to fair criticism of the "uniform contract," but in this case the criticism was not properly applied and an effort was illegitimately made, the result of which if successful would be productive of the very evil which the bodies who framed the standard form aimed to eradicate or prevent, namely, diversity of forms of building contracts. The National Association of Builders has a right to expect from all its constituent bodies, loyalty to the method which it has united in establishing to produce equity and uniformity in this, one of the most important relations which the builder is called upon to assume in carrying on the business of building; and the National Association of Builders has also a right to expect loyalty on the part of constituent bodies of that National Association of Architects with whom it has joined in this important work. If constituent bodies of either of these national associations desire to suggest amendments or changes in the standard form there is a proper way to do it, and but one proper way, and that is by referring their suggestions to the joint standing committee on uniform contract. No constituent body of either party has the right to undermine the great work undertaken, by independently proceeding to supplant the form with some other or by advising its members to ignore altogether the uniform contract and continue on perpetrating diversity and confusion in contract forms.

The American Institute of Architects and the National Association of Builders five years ago deliberately adopted

the principle that in framing forms of building contracts the builder and the architect had equal rights; they still further recognised the importance and value of uniformity; and proceeding upon these lines prepared, issued and recommended the "uniform contract." So long as any local body maintains its affiliation with its central body it should so proceed and should so order its actions as not to handicap or render nugatory the efforts which are instituted by the central body. It may not, it is true, always fully approve of the methods which the central body may adopt, but it is bound at least not to take active measures in opposition thereto except in proper and legitimate ways. The Boston Society of Architects has in this matter ignored the principles which its national body has regularly and fully recognised and adopted, namely, that the builder has equal rights in framing the forms of contract he is to be a party to, and has proceeded as an independent body to do what it can to overthrow that principle as well as prejudice, and embarrass the purposes not only of the body of which it is a chapter, but also of that body with which the American Institute has united for this specific purpose and to which it is in honour bound.

It is unpleasant to note that although the attention of the Boston Society was courteously called to the conditions and obligations existing between the two national bodies, it, with considerable asperity, repelled the right of any one to criticise its acts, although it at the same time maintained its entire freedom to criticise the acts of others. This will be recognised as a familiar attitude on the part of architects as a class. I have given considerable space to this particular manifestation, for it seems to me to involve a principle which ought not to be lost sight of, and demonstrates that there is a failure among architects as a class to comprehend the purpose underlying the establishment of the "uniform contract," and also shows lack of recognition among them of their amenity to anything except their individual desires.

Builders will gradually learn by such examples as this that in the matter of their rights as to forms of contract which they are to sign, as well as in other directions, it is only by united and persistent endeavour that proper relations can be secured and maintained. You may never hope for some one else to be considerate enough to deal justly by you, you must rely upon yourselves for every advance out of the slough into which you have fallen.

In pleasant contrast to the condition of things above described was the meeting of the joint committee on uniform



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contract, to consider for the first time since its establishment a revision of the standard form.

The report of your delegates to that committee will give you in concise form the result of that meeting, in connection with the views of the committee in relation to more universal use of the document. I can only supplement their report by saying that the meeting, in which I participated in an advisory capacity as well as scribe, was most harmonious, and it was particularly gratifying to note that many of the points, the importance of which your original committee found very hard to impress upon the architects who first sat in council with them five years ago, are now considered by the architects themselves as most essential features. I feel assured that the simplification of the form which resulted from this meeting will aid very much in its increased use. The shortening by some five or six hundred words will in itself prove a great card in its favour, for it is now without exception the shortest building contract in general use. I note in the Underwriters' National Convention that our contract was very favourably mentioned. The insurance men have, to use a common phrase, "caught on," to the advantage of uniformity in matters of insurance.

I beg to suggest that the committee in their report cannot too emphatically urge all members of filial bodies to insist for their own protection on the use of this form whenever they are called upon to sign a contract, and further urge all filial bodies to keep a supply on hand, and periodically send out specimen copies to all architects, as well as to their own members, to keep the form in mind as a live issue. Once sending is not enough; people are forgetful, and one of the functions of the local body is to keep those with whom it comes in contact reminded of the things that are done and are being done for their benefit. Printed slips should accompany each specimen copy, with publisher's address, prices and other information.

The report of committee ran as follows:—

For five years the "uniform contract" adopted in 1888 by the joint committee of the American Institute of Architects and the National Association of Builders has been before the public.

The fundamental principles therein expressed have been tested and approved by time, but while the instrument has added to the number of its friends among architects from year to year, and owners have acknowledged its evenhanded fairness to both parties and executed it readily, there still are many architects who do not use this form of contract.

A large number of those who still cling to old forms are

doubtless those whose conservatism impels them to doubt new though better methods, while others have failed to employ the standard form for the reason, which they frankly admit, that the older forms give to them and to their clients the owners a greater advantage over the builders. This is an entirely improper position, for a contract of this nature should in no way give more advantage to one than to the other party to it, and it has been the purpose from the first to provide in the uniform contract an instrument which should give evenhanded justice to all concerned in it.

It is very evident that many architects will not voluntarily adopt this form, either because of their conservatism, or from unwillingness to give up an unfair advantage, or from ignorance of the terms of the document, and it is therefore important that the builders themselves should decline to sign other forms.

The more general use of the uniform contract may be said to depend to a very great extent upon the insistence of builders that this form and no other is acceptable to them. This attitude is strongly urged by your committee.

During the last year meetings of the joint committee have been held, and we now present to you a revised form which, in our judgment, covers the same ground in more direct language, and adapts it better for use of sub-contractors for their particular portions of a building.

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OWING to the perfection which is attained by novel forms of hydraulic machinery, electric water-power has assumed unexpected importance, and its utilisation has become attractive. A paper which was read at the last meeting of the Royal Scottish Society of Arts, by Mr. John Ritchie, indicates that in the North the opportunities of turning water to account will not be neglected. The author said that in this country we

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were much behind people on the Continent and the United States in using water as a source of power. He described some of the hydraulic works in Switzerland, Austria and America, and gave a detailed account of the present gigantic scheme for utilising the waters of Niagara. Reference was also made to similar works in course of construction in India having for their object the utilisation of the water stored for irrigation purposes. In Scotland a large increase in the use of water-power took place between the years 1825 and 1840, and works had been erected at Deanston on the Teith, Stanley on the Tay, Katrine on the Ayr, and Shaws Waterworks at Greenock. The rainfall was the natural origin of all running streams. In England the average fall might be taken at 32 inches; in Scotland it was 36 inches; and in Ireland it was set down at 36 inches. The great drawback to the use of water as a power was owing to the difference between the winter and summer supply, involving the use of steam-engines to supply power in dry weather, and in this connection the question of storage arose. Figures were given to prove that there was abundance of water for every purpose, and the question came to be, Would the construction of reservoirs give an adequate return for the outlay? In his opinion it would. They must look to the future development of some efficient means of storage at high levels and the more extended use of high-pressure turbines. Many Scottish lochs by their configuration lent themselves to an easy adaptation for storage purposes, and land was of little value in such districts. There were four methods by which power could be transmitted to existing centres—first, by wire rope; second, by hydraulic pressure; third, by compressed air; and fourth, by electricity. And an examination of those showed that the only means of transmitting power economically for long distances was by electricity. Mr. Ritchie stated in conclusion that the subject was so large that he proposed to give a further paper on the means of utilising power at a future meeting.

SEWERAGE SYSTEMS AS MUNICIPAL INVESTMENTS.

THE New York *Engineering Record* says:—Some interesting figures, compiled by assistant city engineer Snyder, concerning the actual cost of the Dallas, Tex., sewerage system, have recently reached this office, and are given in abstract below. This system was begun in 1883 under the direction of the city engineer, and all engineering work on the design and construc-

tion has been within his department. Hence the actual capital investment is easily determined, being the amount expended in construction, maintenance and interest on bonds up to date. The separate system is used and embraces 4,920 feet of 36-inch brick sewer at 5·13 dols., 6,926 feet of 24-inch pipe at 3·867 dols., 1,490 feet of 20-inch at 2·291 dols., 2,668 feet of 18-inch at 2·08 dols., 6,188 feet of 15-inch at 3·129 dols., 5,658 feet of 12-inch at 1·208 dols., 5,209 feet of 10-inch at 99 cents, 33,692 feet of 8-inch at 71 cents, and 69,654 feet of 6-inch at 46·2 cents, making a total of 25·8 miles at an average cost of about 1·09 dols. a foot. These prices include all the work incidental to sewerage construction distributed in the following ratio:—Pipe and brick in place, 41·1 per cent.; excavation and back filling, 40·7 per cent.; rock excavation, 10·1 per cent.; man-holes, 2·2 per cent.; lampholes, 0·4 per cent.; embankment, 1·5 per cent.; replacing pavement, 2·7 per cent.; incidentals, lumber, iron pipe, 1·3 per cent.

The cost of operation has been slight. One man has been employed regularly, whose duty is to keep the sewers clear of obstruction, and keep the flush-tanks in order, at an annual expense of 1,000 dols. plus a few incidental repairs. The sewerage bonds of the city bear interest at the rate of 5 per cent., making the annual interest on the total cost of the system, which is 148,270 dols., in round numbers 7,500 dols., or the total annual expense of the entire sewerage system, 8,500 dols. Bonds in excess of this for sewerage improvements have been issued, but the proceeds have been transferred to other accounts; no further sum is really chargeable to the annual expense of the sewerage system, according to the report of Mr. Snyder.

The records show that there were to January 1, 1893, 1,065 connections with the sewers, embracing the following number and kind of fixtures:—Slop-sinks, 967; water-closets, 2,072; urinals, 247; baths, 632; wash-basins, 347. The records of the waterworks office for the quarter ending December 31, 1892, show that the number of taps from which water rents were collected was as follows:—1,272 water-closets at 2 dols. 25 cents; 230 baths at 2 dols. 50 cents; 51 urinals at 3 dols.—total for three months, 3,390 dols., or 14,360 dols. for a year. Sinks and basins are seldom an extra charge for water service over and above the rate for the fixtures mentioned, so no possible income attachable to the sewers from them is taken into account. The average annual income from the above to the sewerage department, were drain-fixtures taxed as water taps are, would be about 14,360 dols., or nearly 10 per cent. of the

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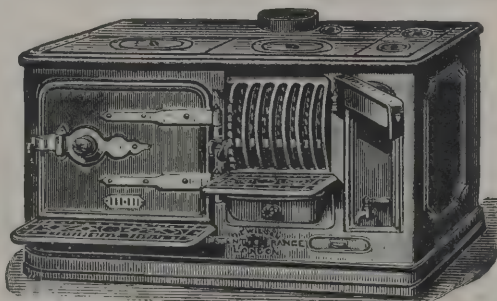
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total cost. It is possibly a little in excess of this amount, as there are many more fixtures in use in the summer months than in the quarter under consideration. The additional cost of operation of a waterworks plant by reason of the increased consumption with a sewerage system in use is an inconsiderable amount, for the sewerage system being a subsequent growth upon the water system, the latter needs no extension of service, according to Mr. Snyder, beyond that for fire-protection, and the extra amount of water consumed is offset by the general cleanliness of the city.

As an investment wherein each class and kind of fixtures could be charged for sewer service in a ratio corresponding with the water service, the following number of fixtures would be chargeable as in use at the present time:—1,412 water-closets, 104 urinals, 276 baths, 710 sinks and 280 wash-basins. The rate of scavenger fees for removing the accumulated filth in cities without a sewerage system, Mr. Snyder reports as varying from 50 cents to one dollar, or even more, a month for dwellings with a small number of occupants. This increases the average possible charges, which could be apportioned in about the following manner:—Water-closets, 80 cents a month; urinals, 25 cents; baths, 20 cents; sinks, 40 cents; basins, 10 cents. These prices Mr. Snyder assumes as the average for a city. For small dwellings they would fall lower, and for single fixtures much used they would rise above the average, each group of fixtures having a rate corresponding to the amount of use. The fixtures in use for the last quarter of 1892 would net an income of 1,528 dollars 80 cents on an annual income of 18,274 dollars, about 12½ per cent. on the money invested.

THE SEVERN BRIDGE AT STOURPORT.

THE toll for crossing the Severn Bridge at Stourport has now been abolished. Stourport, says the *Birmingham Post*, is a town which sprang into existence in the latter part of the last century, entirely through the facilities given to it for water traffic when the Staffordshire and Worcestershire canal was carried to a junction with the Severn at what is now known as Stourport. Bewdley had opposed the construction of a canal to the Severn at Bewdley, and thought to maintain its monopoly of the then great traffic by means of pack-horses and barges to and from that then busy emporium for the goods, which were exchanged from boat to pack-horse or pack-horse

to boat. As many as four hundred pack-horses were at that period sometimes stationed on a single night at Bewdley and Wribbenhall. When the waywardness of Bewdley turned away canal engineers and promoters, the opportunity of Stourport came. The Staffordshire and Worcestershire Canal, as before stated, was constructed, and what was practically as much a waste as the existing reaches of Hartlebury Common became a busy and growing settlement. With the construction of the canal, and the continuous growth of population at Stourport, came the question of spanning the Severn with a bridge, and an Act of Parliament was obtained for the purpose.

In these days of ship canals, however, and Severn improvement schemes, it may not be out of place to state that so long ago as 1784 Mr. William Jessop, an engineer of that time, proposed to convert the Severn into a ship canal as far as Stourport, and the plans and report connected with his scheme are, we understand, still extant. The riparian landowners were hostile to Mr. Jessop's project, and, like many other men, he proved to be before his time, and a long period elapsed before the improvement of the navigation of the Severn again came up. Returning to the subject of the bridge thrown open on Monday, we may state that it was erected by Messrs. Wilton & Co., of Birmingham, under the superintendence of Mr. T. Vale, from the plans of Mr. Edward Wilson, C.E., of Westminster. It cost between 9,000*l.* and 10,000*l.*, and is a bold feature in the scenery of the river.

Mr. B. Danks said they were met that day to perform a ceremony in which the inhabitants of Stourport, Areley Kings and the public generally were deeply interested, viz. to transfer that bridge to the County Council of Worcester as a free bridge. He thought it might not be out of place if, before the trust was dissolved, he gave them a short account of what the trustees of Stourport Bridge had done. In the year 1768 the only way of crossing the Severn for all traffic near there was by the ford at Redstone, or by a ferry-boat kept there, the approach from Stourport side being across Hartlebury Common and down the Watery Lane. This ferry was private property. The Staffordshire and Worcestershire Canal Company about this time made their canal to join the river Severn, and Stourport was rising into importance, although there were at the time only a few houses, and the land now covered with buildings, streets, &c., was then occupied for agricultural purposes. It was thought desirable to erect a bridge over the river, and, as showing the great interest this scheme created, Mr. Danks stated that no fewer than 209 of the leading people in the neighbourhood and



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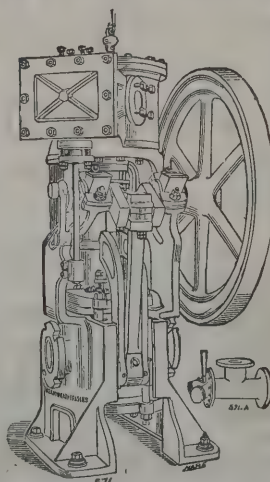
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in the county, amongst which were to be found many family names, applied to Parliament in the reign of George III. for an Act to constitute a body of trustees to build a bridge and make approaches thereto, to raise money on mortgage on security of the tolls, and to purchase the ferry. The trustees had power to levy much higher tolls than they had charged of late years, and one clause was that the bridge was never to become a county bridge. The Act was obtained in 1768, and a bridge consisting of three arches of stone and brick was erected, and about forty-four land arches and one mile of road formed the approaches. This bridge only lasted twenty-seven years, and the tolls taken had not paid the interest on the mortgage debt when, in 1795, a great flood washed away two of the arches, and damaged the third. In this dilemma the trustees again applied to Parliament for a second Act to raise more money and build a new bridge over the river. Profiting by the mishap to the first bridge, the trustees decided to erect a single arch or span over the water, of iron, and it was an early application of iron to bridge building. Iron plates formed the roadway, which was carried by oak uprights and beams from the iron arch. Many present-to-day would recollect that bridge. It became very costly to keep in repair, and, after lasting seventy-three years, was thought not to be in a satisfactory condition, the gradients to the top being very steep, and the bridge narrow. In 1868 the trustees decided to remove the arch crossing the river, and to erect a modern all-iron bridge of easier gradient, and to widen both bridge approaches. A third Act of Parliament had to be obtained to do this, and the result was the substantial and handsome structure they were then upon. It had been in use about twenty-five years, and he thought was in as good condition now as when erected. The trustees had, by their management, reduced the debt on the bridge to a comparatively small amount, and two years ago negotiations were entered into between the trustees and the County Council to make it a county bridge, but it was found that an Act of Parliament was necessary to enable the trustees to transfer the bridge to the County Council, and to enable the County Council to accept the transfer. This was the fourth Act of Parliament obtained by the trustees, but this time it was not to build another bridge, but to enable the trustees to part with the bridge and dissolve the trust. This Act received the Royal assent on May 20, 1892, and it was to carry out and complete the intention of that Act that they were assembled there that day. No doubt the most interesting part to them all was that in future it was to be a free bridge.

BIRMINGHAM BUILDING TRADES

THE protracted strike which took place in the Birmingham building trade in the spring of last year was, the *Birmingham Post* says, the occasion of a large amount of public inconvenience, and must also have entailed considerable pecuniary loss both upon the employers, whose contracts were at a standstill, and upon the bricklayers and labourers, who only secured their advance of wages at a cost which they must have felt very severely. The motive which animated the employers in resisting the demand which was then made was doubtless a feeling that if they conceded the extra halfpenny per hour to the bricklayers and labourers, this would be followed by a claim for an increase on the part of other branches of labour connected with the building industry, and the masters were of opinion that the state of trade would not justify an advance. Nor were they far wrong in their prognostication of further demands, for when the month of October came the carpenters and plasterers gave the six months' notice prescribed by the rules of the trade, that on and after April 1 this year they would expect an increase of a halfpenny an hour, while the stone-masons gave notice for an alteration of working hours. The masters met this with a notice to the bricklayers and labourers to discontinue the extra halfpenny they had gained, and it seemed only too probable that we should have last year's contest repeated this spring upon an extended scale. Happily, as events have proved, the master builders had learnt from their experience the advantage of conciliation, and have now shown that they were willing, provided the operatives would meet them upon some minor points, to concede a continuation for another twelve months of the wages increase that had been won by the men in the last strike, and its extension to the plasterers. Numerous meetings have been held lately, at which the exercise of a friendly spirit has smoothed away difficulties. The remaining difficulty, which principally affected the case of the carpenters, was referred to an arbitration, in which, although his honour Judge Chalmers was in reserve as umpire, it was found possible to come to a settlement without imposing upon that gentleman's much-occupied time and attention. An extra halfpenny per hour was conceded to the carpenters, and an agreement has been signed with respect to questions of hours, of overtime, supervision of work and other matters of internal trade interest. We congratulate those engaged in the trade—both masters and men—upon this result, and trust that the harmonious relations now re-established may long continue between them.

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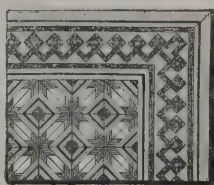
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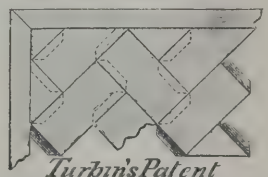
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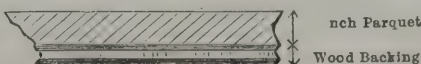
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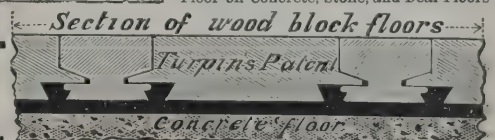
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It will be remembered that the bricklayers, the labourers and the plasterers had differences with their employers, all of which were settled. There remained still a dispute in which the carpenters and joiners were concerned, and this was referred to the arbitration of Mr. Redfern (of the firm of Horton & Redfern, solicitors), acting on behalf of the masters, and Mr. A. R. Jephcott representing the men. The arbitrators agreed that Judge Chalmers should be the umpire in case of any disagreement between them; but, fortunately, no point has arisen on which full but conciliatory discussion has not been found sufficient to bring about an agreement, and yesterday the award was signed. The principal question in dispute was that of the increase of $\frac{1}{2}$ d. per hour asked for by the men. This practically had been conceded by the masters, and the arbitrators have granted it in their award. On a number of minor points, such as the time for ceasing work on Saturdays, payment for overtime, the supervision of carpenters' work, &c., the arbitrators have arrived at a settlement. The decisions of the arbitrators are embodied in a set of new rules, which will be binding on masters and men until April 1, 1894. If either party should desire a revision at the expiration of the twelve months, notice must be given before November 1 next, otherwise the rules will continue in force from year to year, subject to six months' notice for revision, to be given before November 1 in any year.

THE REQUIREMENTS OF THE EDUCATION DEPARTMENT.

THE following are the latest amended rules of the Education Department in respect to the planning of schools:—

School boards and school promoters are requested to note that the Education Department require the following plans, and that inattention to such requirement entails delay.

I. A block plan of the site, drawn to a scale of 20 feet to an inch. This plan must indicate—(a) The position of the school buildings; (b) outbuildings; (c) playgrounds; (d) drains (collateral and main), with their fall and depth below ground; (e) entrances; (f) boundary walls or fences and their nature; (g) roads; (h) the points of the compass; (i) the levels of the ground at the principal points.

II. A plan of each floor of the schoolrooms (and teacher's or caretaker's residence, if any) drawn to a scale of 8 feet to an inch. The internal fittings of the rooms (fireplaces, groups

of desks, benches, &c.) must be accurately shown. The plan should also state whether the rooms are intended for boys, girls or infants. In cases of enlargement a plan showing the buildings as they exist is needed.

III. Sections and at least four elevations, also drawn to a scale of 8 feet to an inch. The ceiling, the positions of window-heads in relation thereto, and the mode of ventilation must be shown.

N.B.—(a) Pencil drawings cannot be received, but coloured tracings in ink may be submitted while plans are in the preliminary stage of pencil, so that suggested alterations can be adopted without difficulty or expense; (b) tracings should be on cloth; (c) in the case of enlargements the whole site and the existing building should be accurately shown; (d) all plans should be dated, the scales drawn on, and dimensions figured.

IV. A detailed specification separated under the several branches of the building trade.

BUILDING RULES.

1. Planning and Accommodation.

I. In planning a school the first thing is to seat the children in the best manner for being taught. The accommodation of each room depends not merely on its area, but also on its shape (especially in relation to the kind of desk proposed), the positions of the doors and fireplaces and its proper lighting. The second point is to group the rooms together in a compact and convenient manner.

2 and 3. Schoolrooms.

2. Every school must have a schoolroom as hereunder, or a central hall as under rule 8. The proper width for a schoolroom is 18 to 20 feet for long desks, or 22 feet for dual desks. If the width does not exceed 20 feet, groups of long desks, three or four in number, according to the width, must be used; if the width is 22 feet dual desks, five rows deep, must be used. (For classrooms see rule 7.)

(a) Accommodation in schoolrooms for elder children is calculated by the number of children seated at desks and benches, subject to a minimum of 10 square feet per child being provided. For the mode of calculating accommodation in classrooms see rule 7, in infant schools see rule 16.

(b) Double-bank schools (now almost obsolete) require rooms 32 feet wide, walls left clear for three rows of desks and ample lighting from windows on both sides extending to ceiling.

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(c) Wasted space cannot be considered.

3. The doors and fireplaces in schoolrooms must be so placed as to allow of the whole of one side of the schoolroom being left free for the groups of benches and desks.

(a) No schoolroom lighted from one side only can be approved. The gable-ends should be fully utilised for light. (See also rules 9 and 9 (b).)

4. Walls, Floors and Roofs.

4. The walls of every schoolroom and classroom, if ceiled at the level of the wall-plate, must be at least 12 feet high from the level of the floor to the ceiling; and if the area contain more than 360 superficial square feet, 13 feet, and if more than 600, then 14 feet.

(a) The walls of every schoolroom and classroom, if ceiled to the rafters and collar beam, must be at least 11 feet high from the floor to the wall-plate, and at least 14 feet to the ceiling across the collar beam.

(b) Great care should be taken to render the roofs impervious to cold and heat.

(c) Roofs open to the apex are not approved. They can only be permitted where the roofs are specially impervious to heat and cold, and where apex-ventilation is provided. Iron tie-rods are least unsightly when placed horizontally.

(d) The whole of the external walls of the school and residence must be solid. If of brick, the thickness must be at least one brick and a half; and if of stone, at least 20 inches.

(e) All walls, not excepting fence walls, must have a damp-proof course just above the ground line.

(f) The whole area of the building should have concrete 6 inches thick under the ground floor, and air bricks for ventilation to joists.

(g) Timber should be protected from mortar and cement by asphalt or tar.

5. Entrances.

5. Entrances should be separate for each department. In large schools more than one entrance is desirable. The principal entrances should never be through the cloak-room. Entrance doors should open outwards. A porch should be external to the schoolroom.

6. Cloak-rooms.

6. Cloak-rooms must be external to schoolrooms and classrooms, with gangways at least 4 feet wide, amply lighted from

the end. Hat-pegs should be 12 inches apart, numbered, and of two tiers. The hanging-space should be 6 inches lineal per child, so as to provide a separate peg for each.

7. Classrooms.

7. Classrooms are calculated at 10 square feet, if not providing accommodation for more than sixty children. Six rows of dual desks or four rows of long-length desks are permissible in such classrooms. Rule 2 applies to all rooms providing accommodation for more than sixty, or being more than 24 feet 8 inches deep from the window wall.

(a) The minimum size of classroom is 18 feet by 15 feet. If desks are placed longitudinally, the width should not be less than 16 feet. This latter width is also allowed in schoolrooms of very small size.

(b) The classrooms should never be passage-rooms from one part of the building to another, nor from the schoolrooms to the playground or yard, and should be on the same level as the schoolroom. Each should be easily cleared without disturbance to any other room.

(c) The number of classrooms should, where practicable, equal the number of classes in the schoolroom.

(d) The excessive use of movable partitions should be avoided.

8. Halls.

8. Large schools are sometimes planned with a central hall, which is not calculated in the accommodation.

In the case of mixed schools an exception is made, one class being necessary in the hall in order to secure a teacher's supervision of the separate exits to the latrines (see rule 13 (a)); the hall must, therefore, be suitable for teaching such class; it must be fully lighted, warmed and ventilated, and must contain a floor space of not less than 1,200 square feet, and the fittings must be marked on the plan.

9. Windows.

9. The light should, as far as possible, and especially in classrooms, be admitted from the left side of the scholars. [This rule will be found greatly to influence the planning.] All other windows in classrooms should be regarded as supplementary, or for summer ventilation. In cases where left light is impossible, right light is next best. Windows full in the eyes of teachers or scholars are not approved. In rooms 14 feet high any space beyond 24 feet from the window wall is insufficiently lighted.

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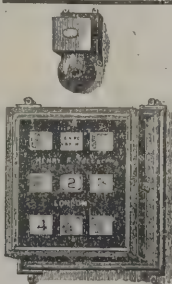


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(a) Windows should never be provided for the sake merely of external effect. All kinds of glazing which diminish the light and are troublesome to keep clean and in repair should be avoided. A large portion of each window should be made to open for ventilation and for cleaning.

(b) The sills of the main lighting windows should be placed about 4 feet above the floor, and the tops of some should always reach nearly to the ceiling. The ordinary rules respecting hospitals should here be remembered.

(c) Skylights are objectionable, and should never be resorted to where windows are possible. Plans needlessly involving their use cannot be approved, except in the case of central halls having ridge or apex ventilation.

10. Staircases.

10. A staircase, like a porch, must be external to the school-room. No triangular steps or "winders" should be used. Each step should be about 13 inches broad, and not more than 6 inches high. The flights should be short, and the landings unbroken by steps. The number of staircases should be sufficient, not only for daily use, but for rapid exit in case of fire or panic.

11. Ventilation.

11. Apart from open windows and doors, there should be provision for copious inlet of fresh air, also for outlet of foul air at the highest point of the room. The best way of providing the latter is to build to each room a separate air chimney, carried up in the same stack with smoke flues. An outlet should be warmed in some manner, or it will frequently act as a cold inlet. The principal point in all ventilation is to prevent stagnant air. Particular expedients are only subsidiary to this main direction.

(a) Although lighting from the left hand is considered so important, ventilation in summer demands also the provision of a small swing window as far from the lighting as possible, and near the ceiling.

12. Warming.

12. The warming should be moderate and evenly distributed so as to maintain a temperature of from 56 deg. to 60 deg. When a corridor or lobby is warmed, the rooms are more easily dealt with, and are less liable to cold draughts. Where schools are wholly warmed by hot water, the principle of direct radiation is recommended. In such cases open grates in addition are useful for extra warming occasionally, and their flues for ventilation always.

(a) A common stove, with a pipe through the wall or roof, can under no circumstances be allowed. Stoves are only approved, when

(i) Provided with proper chimneys (as in the case of open fires);

(ii) Of such a pattern that they cannot become red-hot, or otherwise contaminate the air;

(iii) Supplied with fresh air, direct from the outside, by a flue of not less than 72 inches superficial, and

(iv) Not of such size or shape as to interfere with the floor space necessary for teaching purposes.

(b) A thermometer should always be kept hung up in a school.

13. Sanitary Arrangements.

13. Waterclosets within the main school building are not desirable, and are only sanctioned for female teachers. All others should be at a short distance and completely disconnected from the school.

(a) The doors, staircases and passages leading from the school-room to the latrines (whether in mixed or in other schools), and the latrines themselves, must be separate for the two sexes, and constructed entirely apart from each other. In the case of a mixed school this rule especially affects the planning.

(b) Each closet must be separate, having a door and ventilation to each. More than one seat is not allowed in any closet. A good light should be provided.

(c) The children must not be obliged to pass in front of the teacher's residence in order to reach their latrines.

(d) The following table shows approximately the number of closets needed:—

	For Girls.	For Boys.
Under 50 children	3	2
" 70 "	4	2
" 100 "	5	3
" 150 "	6	3
" 200 "	7	4
" 300 "	8	5
Urinals in proportion		

(e) Cesspools and privies should only be used where unavoidable. Earth or ash closets of an approved type may

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be employed in rural districts, but drains for the disposal of slop and surface water are still necessary.

(f) Soil-drains must always be laid outside the building (on a hard even bottom of concrete) in straight lines with glazed stoneware pipes, carefully jointed in cement and made absolutely water-tight. A diameter of 4 inches is sufficient unless for drains receiving the discharge of more than ten closets. Above this number the diameter should be 6 inches. The fall should never be less than 1 in 30 for 4-inch, and 1 in 40 for 6-inch drains. An inspection opening or chamber should be provided at each change of direction so as to facilitate cleansing the drain without opening the ground. Every soil-drain must be disconnected from the main sewer by a properly constructed trap placed on the line of drain between the latrines and the public sewer. This trap must be thoroughly ventilated by at least two untrapped openings; one being the 4-inch soil pipe carried up full size above the roof and the other an inlet pipe connected with the side of the trap furthest from the public sewer. Automatic flushing tanks are desirable where trough closets are used.

(g) Urinals must in all cases have a sufficient supply of water for flushing.

(h) Waste pipes from sinks or lavatories should be first trapped inside and then made to discharge direct through the wall over a trapped gully.

14. Desks.

14. Benches and desks, graduated according to the ages of the children, should be provided for all the scholars and placed at right angles to the light. (See also rules 3 (a) and 9.)

An allowance of 18 inches per scholar at each desk and bench will suffice (except in the case of the dual desk), and the length of each group should therefore be some multiple of 18 inches with gangways of 18 inches between the groups and at the walls. In the case of the dual desk the usual length is 3 feet 4 inches and the gangways 1 foot 4 inches.

(a) The desk should be very slightly inclined. An angle of 15 deg. is sufficient. The objections to the inclined desk are that pencils, pens, &c., are constantly slipping from it, and that it cannot be conveniently used as a table. The objection to the flat desk is that it has a tendency to make the children stoop. A raised ledge in front of a desk interferes with the arm in writing.

(b) As a general rule, no benches and desks should be more

than 12 feet long. And no group of long desks, in a school-room providing for more than 60 children, should contain more than four rows of benches and desks (or three, if the width is less than 20 feet), because in proportion as the depth is increased, the teacher must raise his voice to a higher pitch; and this becomes exhausting to himself, while at the same time it adds inconveniently to the general noise.

15. Sites and Playgrounds.

15. Every school should have an open airy playground proportioned to the size and needs of the school. The minimum size of site is, in the absence of exceptional circumstances, a quarter of an acre for every 250 children. If the school is of more than one storey this area may be proportionally reduced. The minimum open space is 30 square feet per child.

(a) In the case of a mixed school, playgrounds must be separate for the boys and girls.

(b) All playgrounds should be properly levelled, drained, enclosed and fitted with some simple appliances. A portion should be covered, having one side against a wall. A covered-way should never connect the offices with the main building. Buttresses and corners should be avoided.

(c) An infant school should have its playground on the same level as the school.

16. Infant Schools.

16. Infants should not, except in very small schools, be taught in the same room with older children, as the noise and the training of the infants disturb and injuriously affect the discipline and instruction of the other children.

(a) There must be no opening wider than an ordinary doorway between an infants' and any other schoolroom because of the sound of the infant-teaching.

(b) An infant school and playground should always be on the ground-floor, and if more than eighty scholars are admitted should have one gallery and a small group of benches and desks for the occasional use of the elder infants.

(c) No infant gallery should hold more than eighty or ninety infants. It should be well lighted from one side. The light for object-lessons is as good from the right as from the left.

(d) The width of an infant schoolroom should be in proportion to its size, but not more than 24 feet.

(e) The babies' room should always have an open fire.

(f) The accommodation of an infant school is calculated at 8 square feet for each child, after deducting wasted or useless

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space, but a larger area should be allowed wherever practicable. Where a second standard is taken in an infant school the accommodation for it is calculated at 10 square feet per child.

17. *Cookery Centres and Classrooms.*

17. A cookery centre should be capable of accommodating at least one class of twenty-four at practice and not more than seventy-two at demonstration at one time. A cookery classroom should contain about 400 superficial feet and be approached by a separate entrance in the girls' playground. A small scullery is necessary.

18. *Workshops and Laundries.*

18. Workshops and laundries are best entirely apart from the school.

19. *Teacher's House, &c.*

19. The residence for the master or mistress should contain a parlour, a kitchen, a scullery and three bedrooms, and the smallest dimensions which their lordships can approve are—

For the parlour	12 ft. by 12 ft.	of	8 feet	in height to wall-plate.
„ the kitchen	12 ft. by 10 ft.	super-	8 feet	
„ one of the bedrooms	12 ft. by 10 ft.	ficial	8 feet	if ceiled at wall-plate; or
„ two other bedrooms	9 ft. by 8 ft.	area	7 feet	to wall-plate and 9 feet to ceiling.

(a) The residence must be so planned that the staircase is immediately accessible from an entrance-lobby and from the parlour, kitchen and each bedroom without making a passage of any room.

(b) Each bedroom must be on the upper storey, and must have a fireplace.

(c) The parlour must not open directly into the kitchen or scullery.

(d) There must be no internal communication between the residence and the school.

(e) There must be a separate and distinct yard, with offices.

(f) A caretaker's house need not be quite so large.

(g) All houses should be separate from and not built as part of the schoolhouse.

20 and 21. *Loans.*

20. No loan of money can be obtained from the Public Works Loan Commissioners unless the whole cost of the school, exclusive of site, legal expenses, extra rooms for instruction authorised by the code, and residences (if any), is kept within the sum of 10% per child accommodated. An allowance will also be made in reference to the cost of a

central hall not calculated in the accommodation (rule 8). Rooms for extra subjects recognised by the new code, such as drawing, chemistry, &c., will have an allowance varying from 15s. to 20s. per square foot. From 275% to 400% will be allowed for a caretaker's house. From 275% to 500% will be allowed for a cookery centre. Whether the necessary loan be borrowed in the open market or not, extravagant plans cannot be approved.

21. The Department do not entertain applications for loans when the expenditure has been incurred without their previous sanction.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

5888. Frank Edward Priest, for "Improvements in gullies."
 5910. John William Tegg, for "Improvements in window or sash fasteners."
 5914. Josiah Thomas Shaw, for "Improvements in the construction of sash weights."
 5975. Robert Robinson Cowl, for "A new or improved locking-gear for window sashes."
 5992. William Peyton, for "A new or improved stove or firegrate."
 6023. Alfred Julius Boulton, for "Improvements in coin-freed latches or locks."
 6033. Carello Brothers, for "Improvements in light reflectors."
 6047. Anders Johan Lindblad, for "Improvements in fire-escape ladders."
 6052. Matthew Clark, for "Improvements in or applicable to stoves, ranges and other fireplaces."
 6088. Peter Stewart, for "Improvements in and connected with drain-traps, soil-pipes and the like."

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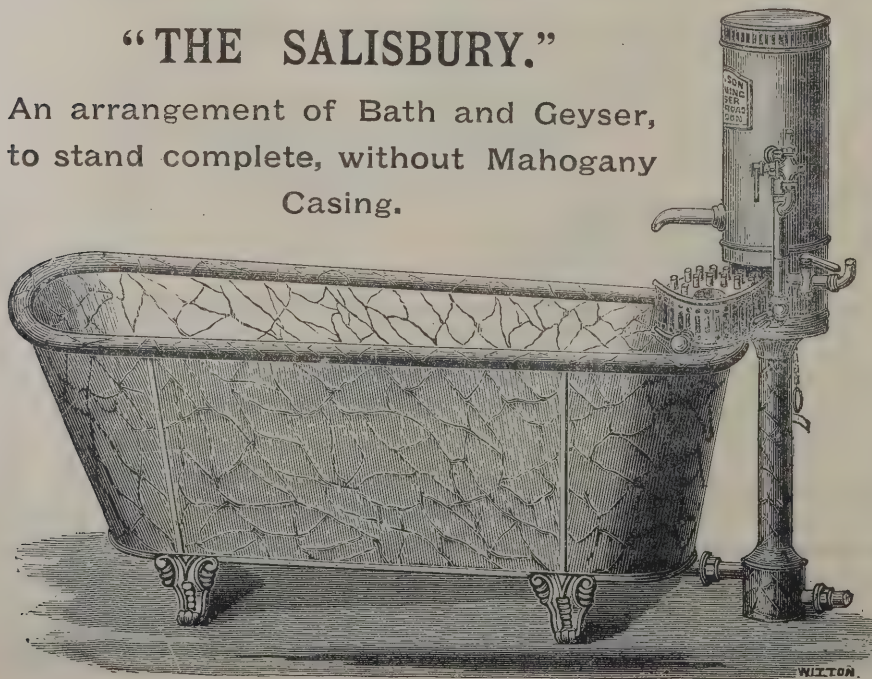
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COMPETITION OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

ABERGWYNFL.—May. 1.—For Building Church. Messrs. Halliday & Anderson, Architects, 19 Duke Street, Cardiff.

ACTON.—April 18.—For Paving Mill's Row. Mr. D. J. Ebbetts, 242 High Street, Acton.

ASHTON-UNDER-LYNE.—April 19.—For Building Post Office. Messrs. Thos. George & Son, Architects, Old Square, Ashton-under-Lyne.

ATHERTON.—For Building Liberal Club. Mr. J. C. Prestwich, Architect, Church Street, Leigh.

ATHLONE.—May 1.—For Constructing Waterworks. Messrs. Strype & Comber, 115 Grafton Street, Dublin.

BALLINGLASS.—April 22.—For Building Cottage and Chimney Stack and Constructing Sewers. Mr. J. R. Dagg, Clerk to the Guardians, Ballinglass, Ireland.

BARGOED.—For Building Church. Mr. E. M. Bruce Vaughan, Architect, Cardiff.

BEDLINO.—April 18.—For Building Thirty Cottages. Mr. J. C. Thomas, The Schools, Bedling, Wales.

BERWICK-ON-TWEED.—April 20.—For Construction of Main Sewerage (1,400 Yards, 6-inch to 15-inch Earthenware Pipes), &c. Mr. Dickinson, Borough Surveyor, U.S.A. Buildings, Berwick-on-Tweed.

BIRMINGHAM.—April 17.—For Laying Limestone Pavement. Mr. William S. Till, City Surveyor, The Council House, Birmingham.

BRADFORD.—April 17.—For Concrete and Brick Tar Tank, at Valley Road Gasworks. Mr. Wood, Gas Engineer, Town Hall, Bradford.

BRADFORD.—April 17.—For Building Allerton Board School. Mr. E. P. Peterson, F.S.A., 10 Exchange, Bradford.

BRIGHTON.—April 18.—For Building Testing-rooms, Coal Store, &c., at Electricity Generating Station. Mr. Francis J. C. May, Town Hall, Brighton.

BUCKHURST HILL.—For Building Villa Residence. Mr. Joseph Sawyer, 63 Chancery Lane, W.C.

CAMBORNE.—April 22.—For Building Two Shops and Dwellings. Mr. James Hicks, Architect, Redruth.

CANTERBURY.—April 24.—For Building Cottage for Sewage Farm Committee. Mr. F. Baker, C.E., Vernon House, Canterbury.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CASTLE RISING.—April 20.—For Building Pair of Cottages. Mr. N. Turnbull, Castle Rising, King's Lynn.

CHANDLER'S WHIN.—April 19.—For Building Four Cottages. Mr. W. Bell, Architect, North-Eastern Railway Company, York.

CHELSEA.—April 26.—For Building Casual Wards. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

CHISWICK.—April 24.—For Constructing Road and Sewers. Messrs. F. & W. Stocker, 90 and 91 Queen Street, Cheapside, E.C.

COATBRIDGE.—April 14.—For Building Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

CORK.—April 24.—For Works at District Asylum. Mr. W. H. Hill, Architect, Cork.

CRUMLIN.—April 25.—For Building Twenty Cottages. Mr. T. C. Wakeling, Architect, Market Square Chambers, Merthyr Tydfil.

DENTON.—For Pulling-down and Rebuilding Co-operative Stores. Mr. T. W. Lindley, Architect, 150A Stamford Street, Ashton-under-Lyne.

DUNS.—April 18.—For Police Buildings, for Berwickshire County Council. Mr. James Jerdan, Architect, 74 George Street, Edinburgh.

ELLENBOROUGH.—For Building Two Houses. Mr. J. Reed, Ellenborough.

ENFIELD.—April 26.—For Building Boundary Wall. Mr. W. Kitteringham, Court House, Enfield.

FLEETWOOD.—April 19.—For Building Mission Church and Parish Room. The Vicar, Fleetwood.

FULBOURN.—April 22.—For Altering and Enlarging School. Mr. I. Miller, Fernside, Fulbourn, Cambridge.

GLASGOW.—April 24.—For Building Carriage Shed at South Side Station. Mr. F. H. Gillies, St. Enoch's Station, Glasgow.

GODALMING.—April 26.—For Constructing Drains. Mr. T. Percival Whatley, Town Clerk, High Street, Godalming.

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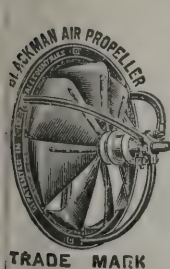
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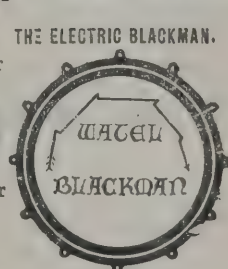
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HAVERSTOCK HILL.—April 24.—For Building Administrative Block, &c., at North-Western Fever Hospital. Mr. T. Duncombe Mann, Norfolk House, Norfolk Street, Strand, W.C.

HEREFORD.—April 26.—For Altering School. Messrs. Nicholson & Son, Architects, Hereford.

HOLY ISLAND.—April 29.—For Taking-down and Rebuilding Hotel. Mr. M. I. Wilson, Architect, 53 Narrowgate, Alnwick.

ISLINGTON.—April 17.—For Erecting Urinal. Mr. J. Patton Barber, Vestry Hall, Upper Street, N.

KENSINGTON.—April 18.—For Laying Wood Paving. Mr. W. Weaver, Town Hall, Kensington High Street, W.

LEITH.—May 10.—For Construction of Reclamation Embankment on Foreshore, and Wet Dock Graving Dock, and Relative Works on East Side of Harbour. Sir Alex. M. Rendel, Engineer, 8 Great George Street, Westminster; or Mr. Peter Whyte, Engineer, Harbour Offices, Leith.

LONDON.—April 18.—For Laying Wood Pavement. Mr. Henry Blake, Sewers Office, Guildhall, E.C.

MAIDSTONE.—April 22.—For Levelling Land for Cricket Ground. Messrs. Tootell & Sons, 13 King Street, Maidstone.

MALDON.—April 21.—For Building Shop. Mr. P. M. Beaumont, Architect, Maldon, Essex.

MANORHAMILTON.—April 20.—For Building Dispensary. Mr. P. Keany, Workhouse, Manorhamilton, Ireland.

MARYPORT.—April 27.—For Mason and Joiner's Work of Five Dwelling-houses. Mr. C. Eaglesfield, Architect, Maryport.

NORTH SHIELDS.—April 19.—For Alterations to Town Hall. Mr. J. F. Smillie, Norfolk Street, North Shields.

OSSETT.—April 21.—For Building Church and Schools. Mr. R. Castle, Architect, Westgate, Cleckheaton.

PONTYPRIDD.—April 19.—For Building Shops. Mr. A. O. Evans, Architect, Town Hall, Pontypridd.

POOLE.—May 9.—For Building New Quay Wall, &c. Messrs. Kinipple & Jaffrey, 3 Victoria Street, S.W.

PORTSMOUTH.—April 25.—For Alterations and Additions to School. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

QUEENSFERRY.—April 17.—For Carrying-out Sewerage Works and Supply of Fire-clay Pipes (1,000 Yards), Flushing Tanks, &c. Mr. John Maclaren, Engineer, County Buildings, Dunfermline.

RUSHDEN.—April 15.—For Constructing Wells, Engine-house, Machinery, &c., at Waterworks. Mr. R. E. Middleton, 17 Victoria Street, Westminster, S.W.

RYE.—April 19.—For Constructing Reservoirs and Engine-house and Laying Water Mains. Mr. Charles Smith, Cinque Ports Street, Rye, Sussex.

SALFORD.—April 15.—For Building Technical School. Mr. Samuel Brown, Town Hall, Salford.

SHEFFIELD.—April 19.—For Construction of Boundary and Retaining Walls, Roads, &c., Goddard Hall Estate, Crabtree. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

SLOUGH.—April 25.—For Building Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

WALLASEY.—April 14.—For Levelling Land, Constructing Branch Railway, Building Retort and Purifying Houses for Gas Works. Mr. H. Ashton Hill, Gas and Waterworks, Great Float, near Birkenhead.

WALSALL.—April 22.—For Building Public Baths. Mr. H. T. Bonner, Architect, 29 and 30 King Street, Cheap-side, E.C.

WALTHAMSTOW.—April 14.—For Making-up Roads and Laying Paving. Mr. G. W. Holmes, Town Hall, Walthamstow.

TENDERS.

BLACKBURN.

For Building County Police Station, Whalley, Blackburn. Messrs. VARLEY & SANDBACH, Architects, 15 Richmond Terrace, Blackburn.

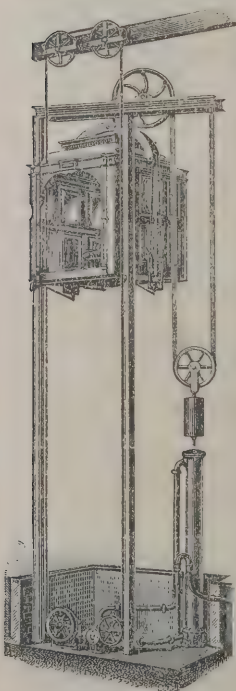
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E. Turner & Sons, Cardiff	3,289	10	0
D. McCarthy, Treforest	3,189	0	0
T. Rees, Ely	3,134	17	9
T. Ashley, Cadoston	3,132	13	5
W. Symonds, Cardiff	3,044	7	1
Holden & Miles, Stourbridge	2,976	2	6
W. THOMAS & CO., Cardiff (accepted)	2,967	4	11

DUDLEY.

For Building Branch Free Libraries at Netherton and Woodside, near Dudley. Mr. TOM GRAZEBROOK, Architect, Dudley and Stourbridge. Quantities by Mr. WYKES, Birmingham.

Netherton Buildings.

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W. Robinson, Birmingham	6,395	0	0
E. Harvey & Son, Netherton	6,278	0	0
J. Mallin, West Bromwich	6,048	0	0
R. Fenwick, Birmingham	6,033	0	0
H. Golding, Netherton	6,019	0	0
H. Dowse & Son, Cradley	5,970	0	0
E. Giles, Birmingham	5,875	0	0
J. Guest & Son, Stourbridge	5,835	0	0
Webb & Round, Dudley	5,818	0	0
W. WILLETTTS, Old Hill, West Dudley (accepted)	5,663	0	0

Woodside Buildings.

W. Holland & Son, Dudley	3,100	0	0
R. Fenwick, Birmingham	3,025	0	0
W. Robinson, Birmingham	2,992	0	0
J. Mallin, West Bromwich	2,880	0	0
E. Giles, Birmingham	2,869	0	0
H. Dowse & Son, Cradley	2,849	0	0
J. Guest & Son, Stourbridge	2,830	0	0
WEBB & ROUND, Dudley (accepted)	2,800	0	0
H. Golding, Netherton	2,797	0	0
W. Willetts, Old Hill, Dudley	2,733	0	0

DUBLIN.

For Building Four Cottages on the Pembroke Estate, Sandymount, for Mrs. J. P. Doyle. Mr. W. G. DOOLIN, M.A., Architect, 20 Ely Place, Dublin. Quantities by Mr. D. W. MORRIS, Surveyor, Dublin.

Collen Bros., Dublin	£1,260	0	0
Donovan, Dublin	1,210	0	0
Harpur, Dublin	1,165	0	0
Brien, Dublin	1,160	0	0
Breen, Dublin	1,125	0	0
Monks, Dublin	1,100	0	0
Kelly & Son, Dublin	1,090	0	0
JOHNSON, Dublin (accepted)	1,054	0	0

FLACKWELL HEATH.

For the Erection of New Stabling at Flackwell Heath, Bucks, for Mr. E. Dickson Park. Mr. ARTHUR VERNON, Architect, 29 Cockspur Street, London, S.W.

J. Barker & Co.	£1,072	0	0
C. H. Hunt	797	0	0
G. H. Gibson	794	10	0
LOOSLEY, SON & PEARCE, High Wycombe (accepted)	780	0	0

HASTINGS.

For Building Technical School, Hastings, for the United District School Board. Messrs. ELWORTHY & SON, Architects, London Road, St. Leonards-on-Sea. Quantities by Architects.

F. D. Foord, Clive Vale	£3,783	3	3
P. Jenkins, St. Leonards	2,990	0	0
T. Salter, St. Leonards	2,880	0	0
H. E. Cruttenden, St. Leonards	2,857	0	0
J. Simmonds, Hastings	2,850	0	0
Moon & Garner, Hastings	2,800	0	0
W. E. Warman, Hastings	2,700	0	0
Eldridge & Cruttenden, St. Leonards	2,692	0	0
D. Snow, Ore	2,675	0	0
F. Cruttenden, St. Leonards	2,585	0	0
W. SMALL, Hastings (accepted)	2,523	0	0
W. Elliott, Hastings	2,395	0	0
Architects' estimate	2,850	0	0

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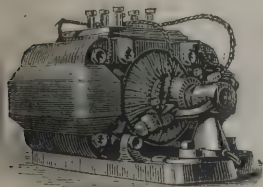
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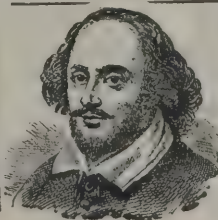
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For Construction of Pipe Drain and Works in Connection, at Cemetery, Hanwell, for the Burial Board for St. Mary Abbots, Kensington. Mr. EDWARD MONSON, Jun., Architect, Grosvenor House, The Vale, Acton.

Serff Bros. & Co, Chiswick	£398	0	0
A. F. Wells, Acton	385	10	0
Nowell & Robson, Kensington	350	0	0
E. Rogers, Notting Hill	343	0	0
H. Morecroft, Acton	298	0	0
W. Parker, Brentford	282	0	0
H. Lee, Southall	238	5	0
G. WIMPEY & CO., The Grove, Hammersmith (accepted)	222	0	0

HORNCASTLE.

For Restoration of Scamblesby Church, Horncastle. Mr. R. H. FOWLER, Architect, Louth.

Harrison Bros., Louth	£980	0	0
Green Bros., Louth	973	10	0
Harrison & Son, Louth	964	0	0
Walter & Hensman, Horncastle	864	0	0
R. MAWER, Louth (accepted)	850	10	0

IXWORTH.

For Building Four Pairs of Cottages, Stow Lane, Ixworth, for the Thingoe Union Rural Sanitary Authority.

H. Plummer, Rattlesden	£1,902	0	0
E. West, Chelmsford	1,762	0	0
Ripper Bros., Cambridge	1,620	0	0
J. Howes, Ixworth	1,578	15	0
J. Robinson, Bury St Edmunds	1,347	0	0
C. PARKER, Wickhambrook (accepted)	1,300	0	0

HOUGHTON.

For Building School Teacher's Residence, &c., at Houghton, near Stockbridge. Mr. JOHN HILLARY, Architect, Long-parish, Hants.

Gilbert, Stockbridge	£424	0	0
Annett, Andover	375	0	0
Grace, Clatford, Andover	356	0	0
Palmer, Stockbridge, Hants	338	0	0

No contract has been entered into at present.

LLANDAFF.

For Building Infant Schools, Llandaff. Messrs. HALLIDAY & ANDERSON, Architects, Cardiff. Quantities by Architects.

T. Richardson, Cardiff	£820	0	0
W. Cox, Llandaff	810	0	0
D. Roberts, Cardiff	761	0	0
C. Dunn, Cardiff	750	0	0
Henry Davies, Cardiff	727	0	0
W. Bowers, Hereford	719	15	0
J. RODGER, Cardiff (accepted)	710	0	0
E. C. Newby, Cardiff	692	7	5

LLANDILO.

For Building a Detached Villa, for Mr. William Griffiths, Llandilo. Mr. DAVID JENKINS, A.R.I.B.A., M.S.A., Architect, Llandilo.

David Evans	£980	0	0
Evan Jones	790	0	0
T. Jenkins	725	0	0
THOMAS BROS. (accepted)	600	0	0
David Jones	579	0	0

LONDON.

For Erection of Stables at 372 Goswell Road, for Mr. Elliott. Mr. J. DOUGLASS MATHEWS, Architect. Quantities by Mr. WOOTTON WILLIAMS.

Dove Bros.	£1,975	0	0
Williams & Son	1,938	0	0
Lowne	1,923	0	0
Howell J. Williams	1,798	0	0
Goodall	1,794	0	0
Larter	1,793	0	0
Killby	1,740	0	0
McFarlane	1,737	0	0
Lawrence & Sons	1,681	0	0
Sheffield Bros.	1,655	0	0

For Building new Premises at Corner of Central Street and Powell Street, E.C., for Mr. H. Hopton.

Hawtrej & Son	£2,105	0	0
C. Ansell	2,076	0	0
Young & Lonsdale	1,941	0	0
Beer	1,920	0	0
Elkington & Son	1,804	14	0

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LONDON—continued.

For Additions, &c., to the South London Granaries, Coldharbour Lane, S.W., for Messrs. Osborne & Young. Mr. R. CRUWYS, M.S.A., F.S.I., Architect, Bank Chambers, 465 Brixton Road, S.W. Quantities by Messrs. FRANKLIN & ANDREWS, 25 Ludgate Hill, E.C.

Higgs & Higgs.	£2,100	0	0
Holliday & Greenwood	2,058	0	0
Balaam Bros.	2,007	0	0
Carmichael	1,870	0	0
Lorden & Sons	1,867	0	0
Turtle & Appleton	1,782	0	0
Rodwell	1,775	0	0

For New Counters and General Bar Fittings at Hummums Hotel, Covent Garden, for Messrs. Woods & Barnes. Messrs. DICKINSON & PATERSON, Architects, 5 John Street, Adelphi. Quantities not supplied.

Patrick & Son	£1,340	0	0
Drew & Cadman	1,245	0	0
Patman & Fotheringham	1,193	0	0
Bush (<i>too late</i>)	1,154	0	0
Edwards & Medway	1,079	0	0
Kearley	1,049	0	0
Dearing & Son, Islington	937	0	0

For Building Twenty-three Houses in Doggett Road, Catford. Messrs. F. & W. STOCKER, Surveyors, 90 and 91 Queen Street, Cheapside, E.C.

Newmans, Limited, Fenchurch Street	£7,890	0	0
J. Stone, Sutton	7,600	0	0
Sloman, Albany Road	7,130	0	0
Pryor, New Cross	7,015	0	0
W. Smith, Croydon	6,995	0	0
Bulled & Co., Croydon	6,675	0	0
R. Peters, Banstead	5,980	0	0
J. E. Edwards, Bow	5,692	10	0
J. H. Jefford, Upton Park	5,520	0	0
G. F. James, Crystal Palace Road	5,353	0	0
E. Parker, Peckham Rye	5,336	0	0
G. R. Storey, Lewisham	5,225	0	0
J. WATT, Catford, S.E. (<i>accepted</i>)	5,014	0	0
F. C. Stokes, Walworth	4,458	0	0

LONDON—continued.

For Erection of Warehouse, Margaret Street, Hackney. Mr. W. H. PUNNETT, Architect, 63 Moorgate Street.

Rogers	£1,875	0	0
Cogman	1,669	0	0
SHURMUR (<i>accepted</i>)	1,665	0	0
Lascombe	1,552	0	0

For Building Premises at Corner of Powell Street and Central Street, E.C., for Messrs. H. Heinrich & Co.

Hawtrej & Son	£2,296	0	0
Barrett & Power	1,987	0	0
Elkington & Son	1,940	0	0
Beer	1,930	0	0
Hoare	1,913	0	0
Pickering	1,746	5	0
H. Wall & Co.	1,746	0	0
Young & Lonsdale	1,725	0	0

For Repairs and Painting at Cleveland Street Sick Asylum, for the Managers. Mr. WM. S. CROSS, Architect, 18 Outer Temple, Strand. Quantities by Messrs. NORTHCROFT, SON & NEIGHBOUR.

	Exterior Painting and Pointing.	Interior Cleaning and Whitewashing.
J. & H. Bangs	£621 10 0	£347 0 0
Howard & Co.	478 9 0	—
W. T. Ballard	434 7 0	—
F. T. Chinchin	422 10 0	340 0 0
H. Wall	414 0 0	350 0 0
Edwd. Proctor	400 15 0	280 0 0
Buckeridge Bros.	400 0 0	—
DORRELL & Co.	379 0 0	*230 0 0
J. & E. Bowyer	378 0 0	—
Matthews Bros.	366 0 0	252 0 0
McMillan & Houghton	365 0 0	323 0 0
W. Wright	341 0 0	—
W. Scott	307 17 0	—
F. Gough & Co.	294 0 0	370 0 0
R. Seed	290 0 0	255 15 0
W. & E. Mills	260 0 0	192 0 0

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For Nave, Aisles and Transepts of Catholic Church, for the Very Rev. Bernard Stephen Canon Wade, O.S.B. Mr. JOSEPH STANISLAUS HANSOM, F.R.I.B.A., Architect, 27 Alfred Place West, South Kensington. Quantities by Mr. HENRY SMITH, F.S.I., 8 John Street, Adelphi, W.C. THOMAS REES, Merthyr Vale (accepted). £4,466 0 0

PONTARDULAIS.

For Building Calvinistic Methodist Chapel, Pontardulais. Thomas, Watkins & Co., Limited, Swansea £1,370 0 0

SWINDON.

For Building Printing Works, Drove Road, Swindon, for Messrs. Eddington & Cadbury. Messrs. BISHOP & PRITCHETT, Architects, Swindon. T. Barrett, Swindon £7,254 10 0
G. Wiltshire, Swindon 6,300 0 0
C. WILLIAMS, Swindon (accepted) 5,959 3 7

TWICKENHAM.

For New Schools, for the Rev. Edmund English. Mr. JOSEPH STANISLAUS HANSOM, F.R.I.B.A., Architect, 27 Alfred Place West, South Kensington. Quantities by Mr. HENRY SMITH, F.S.I., 8 John Street, Adelphi, W.C. OLDRIDGE & SONS, Norbiton (accepted). £1,209 0 0

WES1ON-SUPER-MARE.

For Alterations to Shop and Premises, High Street, for Mr. S. J. Sellick. Mr. C. S. LEECH, Architect. J. PALMER (accepted).

WOO1WICH.

For the Erection of Three Houses and Shops at Corner of New Road and Russell Place, for Messrs. Birts & Son. Mr. H. H. CHURCH, Architect. Quantities supplied by Mr. W. WHINCOP.
Kirk & Randall £2,800 0 0
Chessum & Sons 2,669 0 0
Multon & Wallis 2,598 0 0
F. Tarrant 2,535 0 0
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Balaam Bros 2,430 0 0
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WORKSOP.

For Construction of Pipe Sewers, Iron Pipe Syphon Manholes, &c., and Laying-out Small Sewage Farm of 4½ Acres, for the Worksop Rural Sanitary Authority. Mr. W. H. RADFORD, Engineer, Nottingham.
Green & Makin, Bolsover £3,355 13 0
F. Eyre, Sheffield 2,588 16 0
Holmes & Co., Clay Cross 2,480 13 0
J. Jackson, Whitwell 2,664 2 0
C. Green, Rotherham 2,930 0 0
H. Vickers, Nottingham 2,715 2 0
F. Messom, Nottingham 2,200 0 0
J. F. Price, Nottingham 2,094 0 0
J. Holme, Leicester 1,964 6 0
J. BENTLEY, Leicester (accepted) 1,923 0 0

TRADE NOTES.

MESSRS. LAING, WHARTON & DOWN, of 82A New Bond Street, W., have just received the contracts for electrical installations, or other electrical work, at the following places:—The residence of Mr. S. Gross, 19 Queensborough Terrace; Nos. 1, 2 and 3 Egerton Place, for Mr. Mervyn Macartney; No. 6 Hyde Park Terrace, for Mr. Mervyn Macartney; the erection of fittings, &c., for Sir C. Euan Smith, 11 Draycott Place; the business premises of Mr. Pickett, 79 New Bond Street; the erection of fittings and alterations, for Mr. A. Blomfield, 25 Hereford Square; running new mains and making alterations at 32 George Street, Hanover Square; the residence of Mr. A. H. Robby, 3 Curzon Street.

MR. A. G. HAMILTON, of the "Quintin Matsys Forge," is continuing his business of ornamental and structural ironwork in connection with Messrs. Ritchie & Co., the patentees of the well-known "Lux-Calor" Stoves, at 83 Commercial Road, Waterloo Bridge, S.E.

A MANSION has just been erected near Douglas, Isle of Man, from the designs of Mr. H. B. Scott, 23 Athol Street, Douglas. A large quantity of Corsham Down stone, from the quarries of the Bath Stone Firms, has been used in the construction.

FOR the Clowm Sewerage Works the Worksop Rural Sanitary Authority have accepted the tender of 1,923½, sent in by Mr. John Bentley, of Leicester, for the construction of certain pipe-sewers and laying out sewage farm. The estimate of the

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OPINIONS OF THE PRESS.

"We are not surprised to hear that there has been a great demand for the beautiful reproductions of the well-known frieze by M. Paul Albert Baudoin, entitled 'The Corn Field.' The plates have been reproduced by subscription at half a guinea the set, and so great has been their success that a second edition is being issued."—*The Lady's Pictorial*.
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In consequence of the almost daily demand for these Plates, they have been reproduced by Subscription at Half a Guinea the Set, and are now ready for issuing.

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engineer, Mr. W. H. Radford, for the works was 2,250*l.*, and an additional sum of 500*l.* was included for contingencies. The contract sum is 827*l.* less than the amount allowed in the Local Government Board estimate.

The Walsall Town Council, at their meeting, agreed to accept the tender of Messrs. C. & W. Walker for supplying and erecting at the Pleck Gasworks a set of six cast-iron purifiers, for a sum of 2,040*l.*, and of the tender of Messrs. Clapham Brothers for supplying and erecting at the same works an annular condenser and washer scrubber, for the sums of 520*l.* and 550*l.* respectively; for the Sewage Farm Committee, the tender of Messrs. Goddard, Massey & Warner, for lime-mixers and sluice-gates and frames, at the sum of 144*l.* 10*s.*; and for the Streets Committee, the tenders of Mr. H. Holloway to make Alexandra Street, Spout Lane and Tennyson Street, for 272*l.* 8*s.* 3*d.*, 143*l.* 4*s.* 6*d.* and 125*l.* 19*s.* 10*d.* respectively.

THE firm of Messrs. J. & C. Hay, builders, Dundee, has secured the contract for extensive additions to and alterations on the Burgh School, Kirkcaldy, from plans by Mr. James Gillespie, architect, St. Andrews. The contract for the mason work will amount to between 4,000*l.* and 5,000*l.*

At the meeting of the Wolverhampton Town Council it was resolved that the Lighting Committee should be empowered to advertise for an electrical engineer and an architect, and to give instructions for the preparation of plans and specifications for the construction of all necessary buildings.

ON the occasion of a lecture on the typewriter, recently delivered in Exeter Hall, Mr. H. S. Shultess-Young, barrister, said he had set out originally with a very high ideal in search of a typewriter; but after examining seven or eight of the machines on the market he found it necessary to lower his ideal considerably. Ultimately after careful inquiry and trial he secured a Yost. The Yost was the best, and until something better should take its place he must own himself entirely satisfied with it.

MR. GEORGE STEDMAN, electrical engineer, has removed his works, showrooms and offices to more commodious premises at 69 St. John's Hill, Clapham Junction, S.W.

MESSRS. WINFIELDS LIMITED have secured the important contract for the supply of electric light fittings to the Huddersfield Town Hall.

NO tender has as yet been accepted for the public library proposed to be erected at Poplar; we therefore postpone publishing the list this week.

WE have again pleasure in calling the attention of our readers to the very excellent type-written specifications and bills of quantities prepared by the Anglo-American Association Type-writing Office, at 15 Cockspur Street, S.W. The best proof of their appreciation of the high-class work turned out by the Anglo-American Office is that the many leading metropolitan and country architects, builders and others who patronise them always express their unqualified approval of the neatness and correctness of the work done, and continue their orders.

MESSRS. TOLHURST & SON'S business having greatly increased, they find it necessary to remove their offices to their factory, 1 Bowling Green Lane, Farringdon Road, London, E.C., for facilitating the prompt despatch of orders.

VARIETIES.

It is proposed to construct a deep water dock at Workington, with a view of benefiting the industries of the district.

THE Middleton Town Council proposed to borrow a sum of 42,000*l.* to carry out a sewage scheme prepared by Mr. Hinnell, of Bolton.

It is proposed to build a hospital for infectious diseases at Stratford-on-Avon, the cost of which, exclusive of furnishing, is estimated at 5,000*l*.

AT the meeting of the Society of Arts on Wednesday, the 19th inst., Mr. Gisbert Kapp will read a paper entitled "Some Economic Points in connection with Electricity Supply."

WE have before called attention to the exhibition of the ancient painting *The Wenham Doom*, at St. James's Hall, Piccadilly, which is now open to view.

AT the meeting of the Birkenhead Town Council the plans for the new fever hospital prepared by the Surveyor were approved. The building will cost 20,594*l.*

AT St. Helens it is proposed to raise the necessary funds for building new schools and enlargement of existing schools, to avert the foundation of a School Board.

AT the meeting of the Glasgow Association of Students of the Institution of Civil Engineers, Mr. C. P. Hogg in the chair, Mr. Wm. R. Copland, jun., read a paper on the "Tarapaca Waterworks."

PLANS for building a hospital for treatment of infectious diseases at Tewkesbury have been prepared by Mr. Villar, architect. An inquiry has just been held by the Local Govern-



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ment Board into an application by the Rural Sanitary Authority to borrow 3,000*l.* to carry out the work.

THE Carlisle Journal says:—The Earl of Carlisle has, through Mr. C. J. Ferguson, intimated his wish to present to Tullie House a replica of the alto-relievo designed by Mr. Burne-Jones and executed by the late Sir Edgar Boehm, of the Battle of Flodden Field.

IN consequence of the recommendation of the Sanitary Authority, Pennington, Hants, it has become necessary to make some provision for drainage. A committee has therefore been formed to consider the matter, and they have instructed Messrs. Pinder & Fogerty, civil engineers, of Bournemouth, to prepare a scheme for the drainage of the district.

THE Cleansing Committee of the Manchester Corporation advise the purchase of Chat Moss and three farms situate between the Moss and the Manchester Ship Canal, in all about 2,500 acres, as a place for the disposal of nightsoil and refuse from the city, and that application should be made to the Local Government Board for power to borrow 200,000*l.* to carry out the scheme, provide buildings, plant, &c.

WHATEVER may be the fate of the Parish Councils Bill, there is at least an advantage in understanding its provisions. One of the "Local Government Handy Series," published by Mr. Edgcumbe-Rogers, has been assigned to it, and like the others of the series, the clauses are expressed in language which is not beyond the comprehension of rustics. The little books are invaluable to all who take an interest in following the course of local legislation.

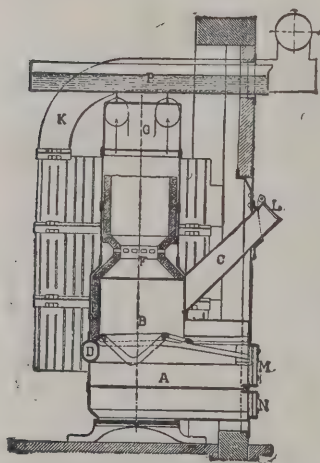
AT the meeting of the Leeds City Council the following resolution was unanimously adopted, viz.:—"That two baths be erected at a cost not exceeding 8,000*l.* each, exclusive of land, one on the site in Union Street known as the 'Midden,' and the other on the vacant land near the Viaduct in Kirkstall Road; and that the Baths and Washhouses Committee be reappointed until October 31 next, to carry out all matters in connection with the Baths and Washhouses Act, and to obtain designs for the two baths recommended to be erected."

AT the meeting of the Leicestershire Architectural and Archaeological Society, held at the old Town Hall Library, the Rev. C. Rodwell in the chair, the chairman referred to the loss sustained by the death of the Rev. L. W. Wood, hon. sec. for the Lutterworth district, and it was resolved that a letter of condolence be sent to his widow. A vote of thanks was passed to Sir Henry Dryden for his present of 300 copies of his draw-

ing of the Foxton Cross. The Rev. E. Jackson, of Gilmorton, was elected honorary local secretary for the Lutterworth district.

THE removing of plaster from the east side of the cloister court of Jesus College, Cambridge, has disclosed a row of arches belonging to the thirteenth century. They appear to have formed a portion of the arcading of the cloisters in the convent which stood on this site before the college was founded. The arches, of which three have already been laid bare, are well preserved. They have been filled up with rubbish, and used to make part of the present wall, which dates from the sixteenth century. The bottoms of the pillars are some 5 feet below the level of the present surface of the ground.

ON Thursday, the 30th ult., Mr. Rienzi Walton, C.E., of Westminster, Local Government Board inspector, held an inquiry at the Town Hall, Maidenhead, in regard to the application of the Corporation for permission to borrow 30,000*l.* for drainage and sewage purification works. The Mayor, with the Town Clerk and most of the Council were in attendance. The Great Western Railway Company, large ratepayers, were also represented. Mr. C. Nicholson Lailey, C.E., of Westminster, engineer of the proposed scheme, gave information as to the size and length of the sewers—amounting to about 14 miles—and stated he intended to treat the sewage by the International Company's system of precipitation with ferozone and filtration through polarite beds, having already adopted it, with remarkable results as to efficiency and economy, at several places. Dr. Angell, F.I.C., public analyst and consulting chemist to the International Company, described the chemical aspect of the system, and conclusively showed that there would be no nuisance, and that the effluent would satisfy the Thames Conservancy. The sewage is at the present time disposed of by broad irrigation, but the land treatment has proved unsatisfactory, many complaints having been made by the Thames Conservancy as to the bad effluent coming from the land. The Conservancy at length called upon the authorities to comply with the Rivers Pollution Act, and adopt the best known and available means for purification of the sewage, which the Corporation eventually agreed to do. There was practically no opposition. Mr. Smith, on behalf of the Great Western Railway Company, wished, on sentimental grounds, that the tanks should be put as far from the station as possible, and this will no doubt be done. The site was afterwards visited by the Government inspector, who expressed his satisfaction with the scheme.



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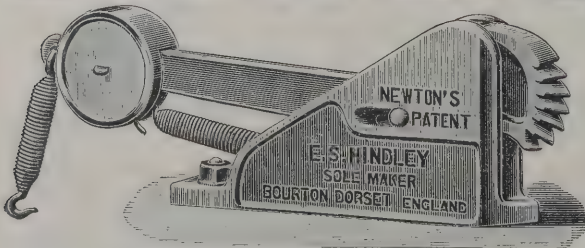
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THE last discussion meeting for the session of the Manchester Association of Engineers has just been held at the Grand Hotel, Aytoun Street, Mr. T. Daniels, president, in the chair. Mr. A. Saxon, read a paper on the best design of main and other bearings. There was no special design of main bearing that would meet all the circumstances and conditions with which engineers were called upon to deal. There was, in fact, no universal bearing that fulfilled all requirements, but out of a number of different designs it was their business to select the most suitable.

At the last quarterly general meeting of the Glasgow Institute of Architects, the president, Mr. W. Forrest Salmon, brought up the following recommendation from the Council of the Institute regarding the proposed by-laws under the Building Regulations Act, 1892, viz. that the Institute withdraw its opposition to the by-laws on the understanding that by-law No. 73 would be struck out, and that it was the intention of the Town Council to prepare in a year or two a Building Act for Glasgow more thorough in character than the existing Acts, and to consult with the Institute when framing the clauses. On the motion of the President the Institute adopted the recommendation.

THE Philatelic Chamber of Horrors, *Bric-à-Brac* says, now open to the public at 281 Strand, from 10 A.M. till dusk, has become the sensation of the philatelic world and the talk of the town. Everybody is talking of it. Stamp-collectors are coming from far and near to see this exhibition, which is simply unique of its kind. There is nothing like it. There can be nothing like it, for Mr. J. W. Palmer has brought together in one room the specimens of counterfeit stamps that he has accumulated in the course of an experience which none other can equal, either in the extent of his operations or the number of years they cover. Anybody can paper a room with stamps, with reprints, or, as they may call them, with remainders. *Bric-à-Brac* asserts confidently that it is impossible for any person in the world to bring together such a collection, numbering nearly 70,000 spurious specimens. "If these postage-stamps were not forged," said Mr. J. W. Palmer, "they would be worth a million sterling." The postage-stamps play the part of wall-paper. They look like an intoxicated mosaic. The room is about 12 feet square, and is in keeping with the exterior of the building, a bit of Old London. The four walls are completely covered with postage-stamps. Such a collection would be curious even if the stamps were not forgeries, for they represent every known stamp in the world.

NOTES ON NOVELTIES.

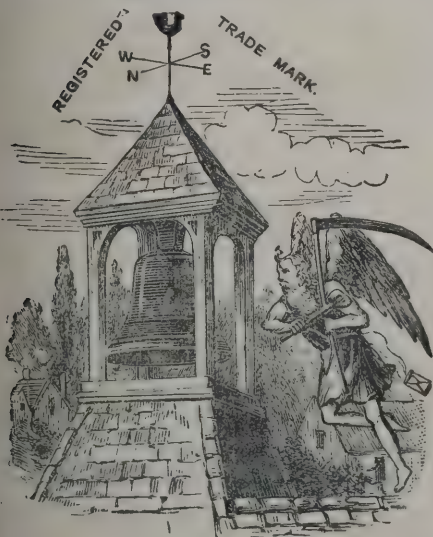
Windows.—The sliding-window, *i.e.* sashes hung with lines and weights and sliding in a cased frame, is pre-eminently a British institution, and will be found in use wherever the Anglo-Saxon race has established itself. Sliding-sashes possess many distinct advantages over the casement light, whether the latter be made to hang inwards or outwards, more especially on account of their adaptability to through ventilation, and con-



sequently are recommended by sanitarians without an exception. To pull the top sash down an inch and to lift the bottom sash up an inch is at once extremely simple and effective for that purpose. But the ordinary sliding-sash has one serious disadvantage, viz. the difficulty of cleaning the outside of the

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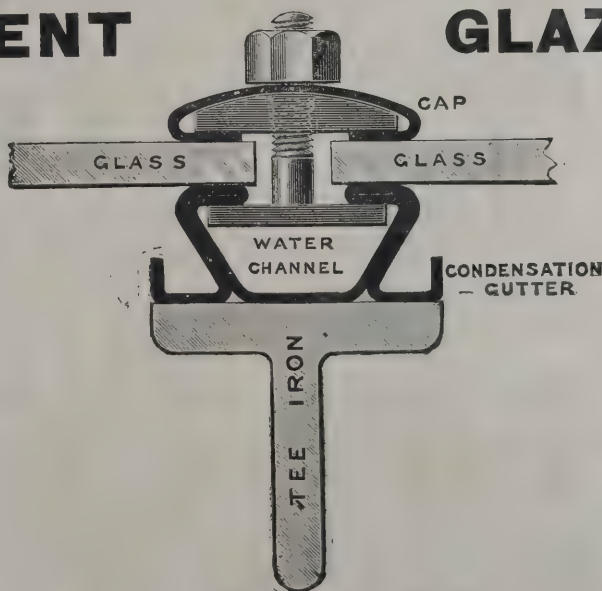


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London	Windermere Church
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Sydney Town Hall, N.S.W.	
Durban Town Hall, S.A.	Eiffel Tower, Paris
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glass without risking life and limb. To employ a man (or as is more frequently the case a lad or a girl) to stand or sit on a ledge or sill, generally not more than six inches wide and some 50 feet from the ground, and without any means of holding excepting by the tips of the fingers to the outside linings, causes a dizzy sensation even to the spectator on terra-firma, and is the cause of some eighty fatalities per annum. The danger attending such a method of cleaning windows has long been recognised, and, as is well known, it is a criminal act, punishable with fine and imprisonment, to employ a person to clean a window in the manner above described (10 & 11 Vic. cap. 89). To overcome the difficulties enumerated inventors have been busy during the past half-century, but unfortunately without any material success hitherto, occasioned probably by the enhanced price and the variation in construction. Houghton's patent window, as shown in the illustration, is quite a new innovation, extremely simple, and appears to us to have overcome the difficulties both as to price and construction, and should command an extensive patronage. With the single exception of a joint in each of the stop-beads, both the sashes and the frame are in appearance exactly similar to any ordinary window, *i.e.* there is no diminution of light or addition of wood, but by simply giving two small bolts a quarter-turn a part of the pulley styles together with stop and parting beads, and one or both of the sashes may be pulled or lifted forward into the room, and the outside of the glass cleaned from the floor level. On lowering them into the frame an airtight joint is formed, and the bolts being released the sashes slide again in the ordinary manner. The sashes may be held up for cleaning either with stays or an automatic pulley arrangement. A specialty in this invention is that any old window can be altered without even unhooking the sashes, and the old beads can be reused. The windows are made and supplied by Houghton's Patent Window Company, Battersea Park Road, S.W.

accumulations or unpleasant odours will be found to be entirely removed. It is not liable to be damaged as ordinary lead traps, and should any repairs be required, or the waste-pipe become choked, the parts can be quickly disconnected without the cutting of pipes or making of new joints. It is adapted for use in conjunction with lavatory basins, sinks, baths, &c., and takes up less space than the ordinary lead trap and its arrangements.

THE FURNITURE TRADE EXHIBITION.

THIS interesting exhibition is now in full swing at the Agricultural Hall, and is replete with every variety of furniture. It is to be regretted that a few well-known firms are not represented, but this is compensated for by the large number of exhibitors. The promoters are endeavouring in every way to make it a success, and to interest visitors. One of the most prominent stands is that of Messrs. F. M. Benjamin, No. 34, the most conspicuous feature of which is its varied character, ranging from antique oak to modern requirements. The centre space is occupied by a very handsome sideboard in the rough, 7 feet in width and 11 feet in height, the carving, which is most elaborate, consisting of a design of foliage and flowers. We understand that this specimen has found a purchaser during the exhibition. A very handsome oak bookcase, with cathedral glass, is also well worthy of notice, as much for its moderate price as high-class workmanship. Furniture of the period of Louis XIV. is also well represented, a fine drawing-room suite, elaborately finished, doing the firm credit. Italian cabinets, engraved with copper, bronze and mother-of-pearl, will interest those who admire artistic work, for goods of this description are decidedly uncommon. Chippendale designs, handsomely upholstered, are *en évidence*, and, to complete the variety, dining and drawing-room suites, at a most moderate price. Oak chairs, Italian, French and German, will provide a liberal choice, either to the buyer of plain or artistic furniture. There is not, in fact, a more interesting exhibit, and we have no doubt that Messrs. F. M. Benjamin will not fail to do a good share of business. The showrooms of the firm are at 102, 104 and 106 Leonard Street, Finsbury, E.C., where all the goods are manufactured.

WE have received from Messrs. Wright Sutcliffe & Son, of Halifax, particulars of their new combined overflow, waste and trap, which they say is quite a novelty, there being nothing like it in the market. It is made entirely of brass, and so constructed that the unions can be readily unscrewed and the trap disconnected for cleansing. By this arrangement the trap can be thoroughly cleansed at periodical intervals by disconnecting and plunging into boiling water or other means, when any



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Amongst other exhibitors whose names are well known are Messrs. Cumming & Smith, whose specialty is Scotch furniture; Messrs. H. L. Benjamin, with many varieties, including a large display of sideboards, and Messrs. Vaughan & Co.

An interesting exhibit to architects is that of Messrs. S. Ives & Co., who show high-class carved oak goods. A handsome sideboard, of Renaissance pattern, fitted with iron hinges, and skilfully carried out in design, with dinner-waggon to match. The locks correspond in every detail with the antique character of the originals. A cabinet—a reproduction from the Nuremberg Museum—with wrought-iron fittings, and other cabinets, book-cases, chairs, complete a splendid exhibit. It will be quite information to many of our readers to know that they can obtain the reproduction of the most antique articles at a price that would seem small for ordinary goods. Italian, French and German work are shown, so that connoisseurs have unlimited choice.

Messrs. Wright & Hansford exhibit Japanese wall-papers, &c. The Mikado Bamboo Co. have a very conspicuous show of bamboo furniture, with that excellent finish which we generally attribute to Parisian work. The bamboo used is of the best quality, and the designs are very novel. Messrs. R. Bashendorff & Co. also exhibit bamboo goods, and Mr. W. E. Carty, their enterprising representative, explains convincingly how Japanese decorations may be introduced in every style of house.

Mr. Charles Davis has a more imposing display of window blinds than at the Building Exhibition, and a patent ventilating window fastener is also shown. This firm seem to have had a considerable demand for their blinds, cornices, &c., during the week.

Mr. W. Duncan Tucker, the well-known horticultural builder, is represented by a large variety of conservatories, &c., and makes a specialty of his patent anti-dry sash bar, whereby the drip so injurious to the growth of plants is prevented. It can also be made in any size and length to suit any house without altering present construction. Mr. George Kidd, their indefatigable representative, will be glad to explain this feature to visitors.

Amongst many well-known names familiar to visitors at every exhibition of the kind are those of Messrs. Kaye & Sons, Limited, locks, &c.; Mr. Robert Adams, door-springs, &c.; the Braloo Window Company, with their well-known patent safety window, &c. We hope to refer again to the exhibition in a subsequent issue.

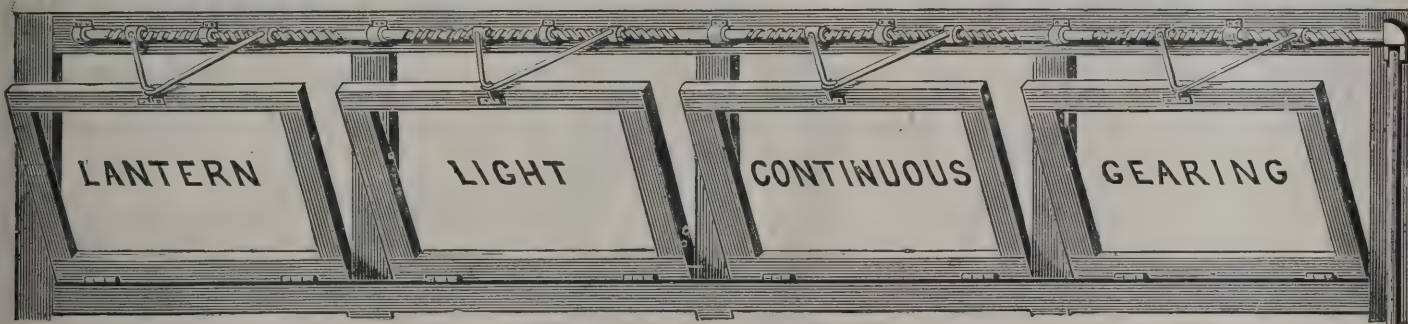
PNEUMATIC WOOD-CARVING MACHINE.

A VERY ingenious wood-carving machine is just now being introduced to the public. It is of the utmost simplicity, and should readily find a sale amongst the carved wood and furniture dealers. The machine is the invention of Messrs. Tyler & Ellis, and the patents have recently been purchased by the Pneumatic Wood-Carving Machine Syndicate, Limited, of 1 Gresham Buildings, Basinghall Street, London, E.C. It is attracting great interest, and is being made in a variety of sizes for power and treadle, and a small machine to fix to a bench will shortly be placed on the market. The immense quantity of wood-carving used for furniture and decorative work, now almost entirely cut by hand, which is necessarily a slow and expensive process compared with the work of this machine, will make it a necessity to the trade. It consists of a table or bench supported on light iron frames. These frames are carried at the back into two bracket-like projections, on which are carried a system of swinging arms and levers so arranged as to give a universal parallel motion to the upper frame. This upper frame is constructed of light solid-drawn steel tubes, very rigidly put together, carrying on the front bar or tube a tracer or dummy and a carving tool and motor. The whole of the moving parts are so counterbalanced, that when the tracer is held in the fingers like an ordinary pencil it can be moved over the table in any direction and up and down with perfect freedom and ease.

The parallel gear is so arranged that the tool or cutter is compelled to move through the same distance as the tracer and to always maintain the same relative position to it, so that whatever figure the point of the dummy describes, the point of this tool always describes an exactly similar shape. With this machine any piece of wood-carving may be reproduced with the utmost accuracy and without any skill on the part of the operator. The original carving or pattern, which may be either in wood or metal or even a plaster-cast, is clamped down to the table, while beside it is fixed a piece of wood of the size necessary for the reproduction of the same. The tracer is then moved slowly by hand over the surface of the pattern, while the cutter removes everything that comes in its way, leaving behind it an exact reproduction of the original pattern.

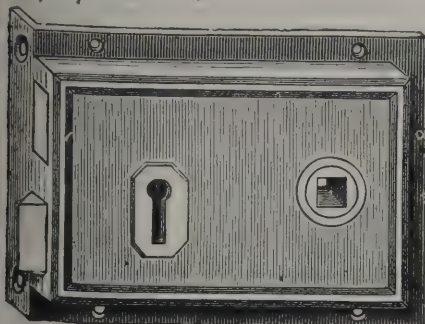
The motor for driving the tool is a most simple and effective piece of mechanism. It consists simply of a spindle running in ball bearings, the lower end of which carries an ordinary drill chuck for holding the tool. Just above this is mounted a

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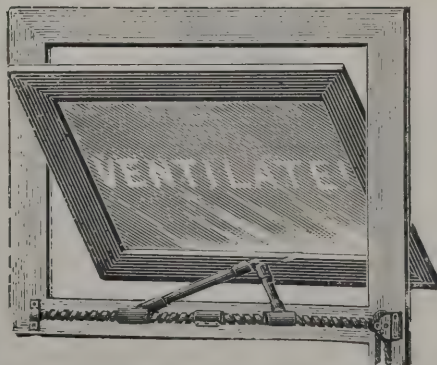


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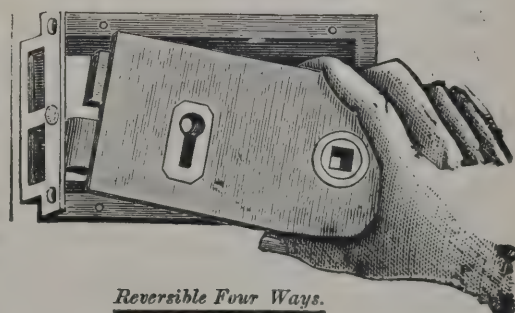


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disc carrying fans or vanes similar to those of a centrifugal pump which revolve inside a case. Into this case the air is led through a nozzle, and, striking the vanes, causes the spindle to revolve with an enormous velocity, as many as 30,000 revolutions per minute being sometimes reached.

The reservoir of the bellows is loaded down with springs, so that the pressure on it can be varied according to the quantity of air present. A flexible rubber hose leads from the bellows to the motor, to allow the latter to be moved about with perfect freedom. The motors are made with such accuracy and are so nicely balanced that even at the highest speed there is no apparent vibration, and there being no guts or belts required to drive it, it is perfectly free from any external force; thus there is no resistance to overcome in moving the tracer over the work, except the resistance of the wood to be cut, which is very small, and the inertia of the parts.

The whole machine is of neat design, lightly but strongly made, and, beyond an occasional oiling, requires no skilled attention whatever.

PHOTOGRAPHY.

LAST year Messrs. Perken, Son & Rayment organised a competition for a series of prizes to be awarded for photographs executed with their doublet lenses, and the prints sent in—together with enlargements from the negatives—are now on view at 99 Hatton Garden. The competing photographs are about 350 in number, and range from quarter-plate size to 15 by 12, while the series of enlargements—some of them from quarter-plate to nearly thirty-inch base—are specially good, and show a fineness of detail all over the sheet which we could barely expect in direct pictures. Another competition is, we believe, to be shortly organised. The latest form of the "Rayment" portable camera is a camera with the Kinnear bellows, and fully equipped with aluminium fittings. The half-plate camera focusses out to 18 inches, and all adjustments are rapidly made by the application of the firm's rack-and-pinion arrangement, which is pushed out of gear by a single movement. The doublet lens, which was fitted to the camera when we saw it, is set in aluminium, and is inside the camera, a blind-shutter being on the outside; by this device the lens remains inside the camera when the apparatus is closed for travelling, and adds nothing to the thickness of the package. The ready means of detaching the front of the camera by means of two bolts acting together must be seen to be appreciated. A batch of thirty

clinical thermometers had just been returned from the Kew examination. Out of the thirty no less than sixteen were returned as standard at the four bearing points 95 deg., 100 deg., 105 deg. and 110 deg., while the maximum divergence was two-tenths of a degree, and only four instruments showed this divergence.

THE LATE JOSEPH WILLETT.

THE death took place on Monday, the 10th inst., at the age of ninety-one years, of Mr. Joseph Willett, whose life forms an interesting connecting link with some of the greatest engineering works of the century. Mr. Willett was associated with George Stephenson, Brunel and other well-known railway men and contractors. He was contemporary with the father of the present Lord Brassey, with whom he had business connections of an important character. He took an active part as a contractor in the opening up of the Manchester and Liverpool Railway, the pioneer system of the country, and had especially to do with what were then considered great undertakings at Wigan. He was present at the opening of the railway between this city, says the *Liverpool Courier*, and Manchester, when Mr. Huskisson was killed. Deceased worked directly under the supervision of Stephenson, of whom he used to record many interesting anecdotes. In addition to works on the pioneer line of England, Mr. Willett was also entrusted with large railway contracts in connection with the Birmingham and Rugby, and the Birmingham and Worcester, and the Cardiff and Neath railways. Mr. Willett married a daughter of Pritchard, "the father of tunnels." The deceased gentleman used often to talk to his friends about his early days, and he gave it as his opinion that in the matter of bridge construction Brunel was the superior of George Stephenson. The deceased himself carried out some of the most renowned tunnelling works in the district. Mr. Willett was always a very abstemious man. He was fond of tobacco, and up to Friday last, when he took his last "draw" of the weed, he indulged regularly and pleasurably in the habit. It was a great source of gratification to Mr. Willett in his old age to observe the vast development of railway enterprise since the days when he first made its acquaintance. His wonder and satisfaction often caused a smile to pass over his face when he conjured up the days when a train would stick fast on the line and a horse would have to be hooked on to the carriages to pull them along. He used to relate that an engine which was brought up to Liverpool was found to be too heavy in its make

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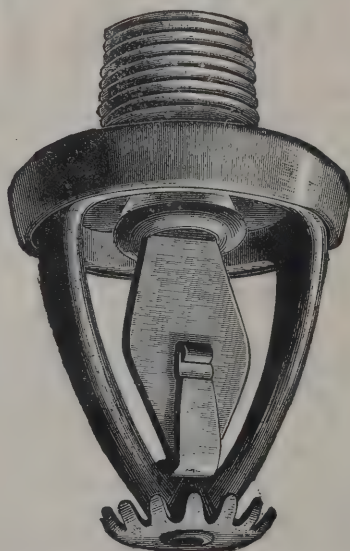
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for the metals, and it was with some difficulty taken off the line and sent away in a canal boat to another system, where it was more likely to be of service. Mr. Willett enjoyed exceptionally good health during his long career, first as a railway contractor, and subsequently as a manufacturer of patent manure.

THE MIDLAND CANALS AND THE BRISTOL CHANNEL.

A CARDIFF correspondent of the *Manchester Guardian* writes:—Eight million tons of traffic are yearly carried over the network of canals comprised in what is generally described as the Birmingham Navigation. Some of it passes over the Shropshire canals to Ellesmere Port, and more will necessarily go that way when the Manchester Ship Canal is completed. A large trade is carried on with Hull also by means of the waterways between Birmingham and the Trent Navigation. There has, however, always been a constant, if slow, communication between the Midland manufacturing districts and Bristol Channel ports by way of Worcester and the Severn river and the Gloucester and Berkeley Canal to Sharpness. This trade is expected to be greatly developed by the deepening and widening of the Severn Navigation. It should, according to the calculation of the Severn Commissioners, receive a new impetus when the river is dredged up to Stourport to an even depth of 10 feet of water, with a bottom depth of 40 feet. But the Birmingham Navigation as it exists to-day places many impediments in the way of rapid water communication between the Bristol Channel and the Midland districts or the further north. There are waterways which would enable Bristol or Cardiff to run steam barges carrying 30 tons of cargo, and taking a cargo-barge in tow, either to Southampton on the one side or Liverpool and Ellesmere Port on the other. In the matter of access to Birmingham, however, an obstacle is raised by a series of thirty locks within a distance of 3 or 4 miles, which means a rise and fall of, roughly speaking, 200 feet from the level of the table-land. This it is proposed to meet by converting the long link of locks into an incline. Such a "lift" as that on the Weaver Navigation near Northwich is in this case out of the question. The proposal of the engineers who have been consulted is to receive the barges, whether propelled by steam or hauled, into a caisson, which shall be drawn by cable moved by hydraulic power up the stiff ascent, the descending vessel being made to help to raise the ascending craft. Mr. J. McGregor, whose name is honourably known in

connection with the improved works of the inland navigation of India, was the most distinguished member of a party of engineers and others who have just examined the Midland Canal ramifications and the Severn between Worcester and Gloucester. Vessels carrying 400 tons will be able to navigate the Severn from the sea to Worcester, instead of the 80-ton boats which have up to now been used for the journey. Mr. McGregor is of opinion that with specially constructed steam barges carrying 30 tons of cargo, and towing one or more barges of similar capacity, it will be possible to make Birmingham in 15 hours or connect with the Manchester Ship Canal in 48 hours. He estimates that ocean-going steamers will be able to steam up the improved Severn to Worcester at the rate of $7\frac{1}{2}$ miles an hour, or with a barge in tow at 6 miles. But until the Birmingham canals are taken in hand and reformed altogether, the rate of progress must at best be limited to 4 miles. Yet, even as things are, with the new boats the time taken for the transport of goods between Worcester and Birmingham will be shortened from 4 days, or sometimes a week, to less than a day and a half.

SUBTERRANEAN COMMUNICATIONS.

THE Philosophical Society's annual lecture in honour of the anniversary of the birth of James Watt was delivered in the lecture-hall of the Watt Museum, Greenock, by Sir Frederick Bramwell, Bart. The subject was "Subterranean Communications." At the outset the lecturer said that he proposed to confine himself to cases where the subterranean communication was for purposes of traffic, as ordinarily understood, and specially to deal with the kind of tunnelling performed with the aid of shields, supplemented or not, as occasion may require, by the employment of compressed air. Leaving the ancient history of the subject to take care of itself, he would go no further back than the Thames tunnel of the elder Brunel, which was commenced on the Rotherhithe side in 1826 and completed in 1843, so far as foot traffic was concerned, in which condition it remained until 1865, when it was acquired by the East London Railway Company, and was now used to afford railway communication between the north and the south of the Thames. This work was undoubtedly, when all the circumstances were considered, a great engineering triumph. The engineer was the victor in this battle. But it was well to know that victories are

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not unfrequently disastrous for the conqueror, and in the case of the Thames tunnel the public remembered the years that had been taken in the construction far in excess of the estimate of time, the cost far in excess of the estimate of capital and the fact that, after all, the work was incomplete as regarded the intended purpose of a road communication. It was in 1830 that Lord Cochrane obtained a patent for facilitating excavation, sinking and mining, and the combination of the employment of compressed air with the use of ordinary pumping was many years afterwards carried into effect in sinking the central pier of the Saltash Bridge. But Lord Cochrane not only saw the value of compressed air in the sinking of shafts, but he appreciated that value for the purposes of tunnel driving, in that its pressure against the working face would hold back the water. It is true, however, that Lord Cochrane did not appear to have appreciated a difficulty in using compressed air against a vertical face, and that he believed the use of compressed air would put an end to all trouble, and that no shield would be needed. So far as he knew, no use was made of compressed air, even for shaft-sinking, in England until 1850, when it was resorted to in sinking the caisson for the piers of the new Rochester roadway bridge. As to the provision of means for an inter-metropolitan communication, it was inevitable that as cities increased the ways that were first provided should become inadequate for the purpose and that they should need supplementing, even for the mode of conveyance in vogue at the time of the construction. Moreover, this augmentation of the means of ordinary communication, when made at great cost by the acquisition of valuable property pulled down to widen existing thoroughfares or to admit of the formation of totally new streets, resulted after all in little more than relieving the congestion of traffic, but did not provide the means of quicker transport. Three courses to attain the end were open to the engineer. First, to acquire property as if for a new street and to construct a railway on a viaduct. Second, with the object of saving the expense of the acquisition of property, the following the course of existing roadways by a subterranean line. Third, if the people would put up with it, and if the rights of property were wholly disregarded, the existing roadways might be utilised by the construction of a full-blown New York elevated railway, with the locomotives travelling on the level of the first-floor windows. In Liverpool there had been established an overhead railway, the trial trip of which had just taken place. This railway was an instance of an imitation of an American line, but shorn of

its obnoxious features. It did not interfere with the privacy of dwelling-houses, it did not darken their ground floors, and the traction was electric and not by steam locomotives. There was, on reflection, another course—to acquire property, as if for a railway above ground, but instead of devoting the space to the purposes of a railway only, use the surface for an ordinary street and make below it a subterranean railway. Engineers for the last few years had been turning their attention for inter-metropolitan communication to deep-seated tunnels of small dimensions as compared with the ordinary railway tunnel, and in connection with such construction had reverted, after a lapse of years, to the employment of shields, as projected by Brunel, and used by him and by Barlow. As instancing the improvement by the use of shields with compressed air in carrying out subterranean engineering, Sir Frederick reverted to works of this character in other connections than those inter-metropolitan communications, and said a few words about the Liverpool waterworks pipe tunnel, which runs along a line of 77 miles, of the proposed Blackwall tunnel by the London County Council and other similar works. Of the Govan subway he remarked that the great feature of it was that the vehicular traffic was to be raised and lowered by hydraulic power, a plan in which he had every confidence. The Glasgow district subway was also another instance within their cognisance of the use of shields with compressed air.

RAILWAYS IN IRELAND.

Two great wants of which railway travellers in Ireland have always had to complain, the *Dublin Daily Express* says, are the absence of any satisfactory heating apparatus when the weather is cold, and the utter inadequacy of the light supplied when the shades of night have descended. That a remedy for those two terrible enemies to the comfort of passengers on our railways has at last been found, was rendered manifest to all who were fortunate enough to take part in the trial trip of what may be said, without exaggeration, to be the first well-warmed and properly-lighted passenger train in Ireland. The train, which consisted of half a dozen first, second and third class and composite carriages, left Amiens Street Terminus, Dublin, for a run to Drogheda and back, in the course of which the excellency of the new systems for supplying light and heat was strikingly demonstrated. For a considerable time past the passenger cars on several American railroads have been heated by steam passing from the boiler of the engine into pipes placed

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under the seats of the carriages, and so contrived that the heat shall remain a constant quantity, the temperature never rising or falling below what is suitable for the state of the weather. This process—the advantages of which only those who have been alternately scorched and frozen, according to the ever-varying condition of the foot-warmers at present in use, can appreciate—was recently introduced into the United Kingdom by Messrs. Laycock, of Sheffield, and having been adopted by some English companies, has now for the first time been tried in Ireland by the Great Northern Company. Another improvement introduced for the first time into this country in this train was electric light, supplied by the energy arising from the motion of the train. Many of the first and second-class carriages on the Great Northern Railway are fitted with electric lamps lit from electric accumulators placed underneath the floor. The accumulators have always to be recharged by means of a gas-engine, either in Belfast or Dublin. The clumsiness, the cost and the trouble of this method of necessity precludes its adoption on any but a very limited scale. To many it would seem that the motion of the train would have been looked to, in the first instance, as the proper source of energy to supply the light, but probably the absence of regulators to insure a clear, steady current to keep the incandescent burner glowing with the proper intensity compelled the company to fall back on accumulators alone. Now, however, the former difficulties have been overcome, and a beautifully clear steady light can be supplied to all the carriages of a train by its mere motion, and there will never be any necessity to charge accumulators by outside energy, as is done at present. The light is supplied by means of a number of accumulators stored in the guard's van. These are charged by the motion of a shaft, which is connected through a hole in the floor by means of a machine belt with one of the axles or revolving wheels beneath. When the train is in motion the accumulators become charged, and by turning a switch in the guard's van the light is supplied to the whole train. If the speed becomes excessive, the surplus electricity thereby generated is dissipated through several coils of wire which have been arranged for the purpose; and if the speed is very slow or if the train stops the current still continues to be supplied at the proper pressure from the accumulators, which contain electricity enough to last for several hours, so that a bright clear steady light of uniform intensity is constantly maintained, no matter whether the train be moving rapidly, slowly or not at all. If a passenger does not wish to have the

light it can be turned off by a little cock at the burner. Third-class railway passengers in this country have, as a rule, been treated with little consideration, though of late considerable improvement in their condition has been effected on some of our principal lines. It is gratifying, however, to note that this latest improvement in the method of supplying both heat and light is not confined to any special class of passenger, but is common to all. Judged from the result of the trip, the new arrangements for giving heat and light to railway passengers are as near perfection as it is possible to imagine. The run to Drogheda and back, which was carried out in good time, and without the slightest mishap, was thoroughly enjoyed by all those who took part in it, a return being made to Dublin about six o'clock.

YORKSHIRE SANITARY ASSOCIATION.

At the meeting of this Association just held at the offices, Park Square, Leeds, Mr. Charlesworth presiding, the report submitted by the council showed an increase of members during the past year. The number of houses inspected for the first time during the past year was eighty-four, bringing the total number inspected by the Association from its commencement in 1886 to 1,260. The Chairman, in moving the adoption of the report, congratulated the society on the excellent work done by the engineers and executive committee, and also upon the great progress made since its formation. He said it was curious how little progress until lately had been made in house drainage. For many years, although house drainage was required and was carried out, it was no one's special duty to look after it. Of late years, however, a change had come, and he could not help thinking that it was partly due to the action of that society. If they examined the drainage of houses throughout the county they would find a very large proportion were still in a very bad condition, and that meant a serious state of affairs. The question arose, then, were the people to be made solely responsible for the drainage of their houses, or should the burden rest on the sanitary authority? He did not think it would be beneficial if sanitary authorities were made solely responsible, but he thought the landlord and tenant should be made mutually responsible to each other. That applied to houses of the well-to-do; but in the case of the poorer class of property, he thought it important that the sanitary authorities should exercise a control.

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THE new water-softening works belonging to the St. Helens Corporation, which have been erected at Brown Edge, Nut Grove, at a cost of 11,000*l.*, have been formally opened by the mayor, Mr. A. Sinclair. The object of the works is to reduce to a uniform rate of 10 or 12 degrees of hardness the whole of the water supplied to the borough. The water from Eccleston Hill and Whiston already fulfils this condition, but that from Collins Green, which has 22 degrees of hardness, and from Knowsley and Kirby, which have 18 degrees of hardness, will be treated at Brown Edge, and rendered as soft as the other. The new building adjoins the boundary wall of the new Rainhill Asylum. It has been erected by Mr. John Whittaker, of Sutton, and the machinery has been put in by Messrs. Woodhouse & Rawson, of Kidsgrove, the whole of the work being carried out under the superintendence of the water engineer, Mr. D. M. F. Gaskin, and the resident engineer, Mr. E. T. Hildred.

The Mayor, in starting the machinery, said in 1862 the consumption of water was 250,000,000 gallons, whereas in 1891 it was over a thousand million gallons—an increase of fourfold. The removal of the iron from the water was an important matter. His impression was that four new boilers had to be put in at his house owing to the large quantity of iron in the water.

TRADE ARRANGEMENTS.

THE following correspondence has taken place between Mr. Anstey and the secretary of the National Association of Operative Plasterers:—

1 Addington Square, Camberwell Road, S.E. :

November 13, 1892.

Sir,—I think the time has now arrived when I may venture to acknowledge the action of your society in stopping my business. After many years trading as a contractor for plastering work, in and about London, I suddenly find myself bereft of workmen and unable in consequence to undertake any more work for a time, or indeed to complete the contracts which I had in hand, since your society has kindly put the brake on. I may mention that I am grateful to you for one thing, and that is, your kindness in selecting for the period of your attack the slackest time I have known for many years past.

If your act of petty tyranny had taken place at some future

time it would probably have caused me serious loss, and it might also have inconvenienced some of my customers, but as it is I can afford to smile at the truly workmanlike diplomacy which orders the trade to boycott one of its best friends—one who challenges any man in the trade to prove that I have ever done otherwise, throughout my career as a plasterer, than to faithfully uphold the principle of the trade.

However, I now take the liberty of asking you why it is that I am boycotted, and what action it is possible to take to restore me to the favour of your society. I will not ask you for any reason reconcilable with the dictates of common sense, for there can be none.

Do you object to my being an employer of labour? If so, I must ask you to be at least consistent and inform the writer why he is selected, I may say honoured, by your keeping him under your notice for the last few months past.

Now, I am under the impression that my sole offence is that I have taken the unpardonable liberty of rising somewhat above the level of my fellow-workmen in becoming an employer instead of remaining a journeyman. If that is so, I regret sincerely that the great body of otherwise intelligent men for whom you act cannot see further into this particular matter. Awaiting your reply, I have the honour to remain, your obedient servant,

(Signed) HENRY ANSTEY.

The General Secretary, Plasterers' Society.

National Association of Operative Plasterers :

December 12, 1892.

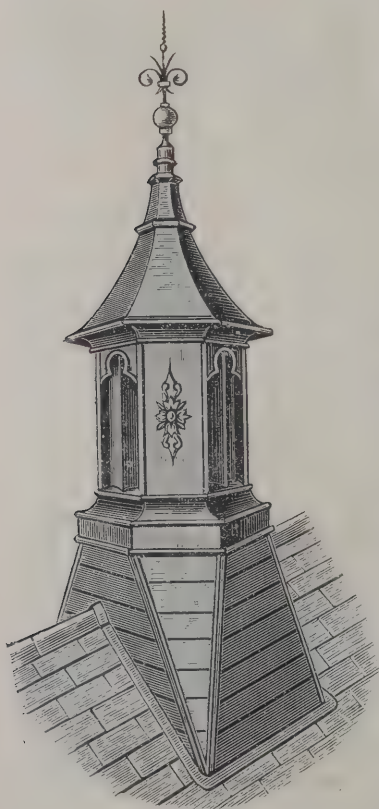
Mr. Anstey,—Dear Sir,—Your letter has been laid before the above committee, who instruct me to inform you that a ballot of the members of the London District of the National Association and the Metropolitan Society, as to whether piece-work plasterers recently struck against be reinstated, has been taken, with the result that 31 voted for reinstatement and 1,973 voted against. Your good-humoured banter could really never have been penned expecting a reply; committee therefore instruct me to be silent respecting it.—I am, yours obediently,

—, Secretary, &c.

1 Addington Square, Camberwell Road, S.E. :

December 28, 1892.

Sir,—I am duly in receipt of your letter of the 12th inst. in answer to mine of the 13th ultimo. I understand therefrom that it is the intention of your committee to prevent all further progress in business on my part, and you give as an argument



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for this, and as the only argument, that a ballot has been taken of the members of the London district of the Plasterers' Society, with the result that the reinstatement, as it is imperitantly termed, of piecework plasterers was voted against by an immense majority.

Your letter is a truly pitiable statement—I cannot call it a defence. Because 1,973 plasterers, who have never had the matter fairly placed before them, and consequently could have had but the haziest notion of what they were voting against, declare against the so-called reinstatement, your committee calmly instruct you to write and tell me the result of the ballot, as if the will of your committee was as the laws of the Medes and Persians, and as if that were an end of my business and of me also.

I doubt that very much. It rather proves to my mind that your committee does not seriously consider the immense power they control, or otherwise they would never use the same so tyrannically. What a ponderous machine to set in motion with such a base object in view, viz. to prevent a man from following his legitimate calling, and virtually stealing from him the opportunities of earning an honest livelihood, under the garb of doing away with piecework plasterers.

Now, if this is really your earnest desire, why do you not stop the piecework plasterers who are also members of your society? This is blowing hot and blowing cold with a vengeance. However, this is the kind of petty tyranny which has been dealt out to me by the order of your committee, without the slightest notice or the reason for so doing, and when I venture to ask for a reason you coolly inform me your committee instructs you to be silent in the matter.

Now, I will ask your committee as, I must presume, a reasonable and responsible body of men, is this consistent with the fair trading of which there has been so much talk about on behalf of the members of your society? I think not. To my mind this kind of business savours more of a secret organisation than a body of British workmen banding themselves together in council for their mutual benefit and for the advancement of the honourable craft which they represent. Now, will you kindly note the following remarks, and if you can instil them in the minds of your evidently not very communicative committee I shall be glad. In the first place, I demand an answer to my question, "Why am I boycotted?" Is the reason merely because I am a plastering contractor? I have always paid the full rate of wages, and declined to employ men at rates below the standard. Your committee can therefore have nothing to

say against me on that score. In the second place, you will be good enough to point out to your committee that I do not class myself in the category of piecework plasterers, neither do I see where the banter comes in, unless it be on your own side. In the third place, your committee may make a note of the fact that the power of reinstatement does not lie in their incapable hands, but in the hands of the master builders. Your committee can unjustly boycott, but they have no power to reinstate. Now, I wish to be enlightened on these matters, and therefore I must ask you to be generous enough to answer this letter in detail; I shall then know what further steps to take.—I am, yours truly,

(Signed)

HENRY ANSTEV.

The Secretary, National Association of Operative Plasterers.

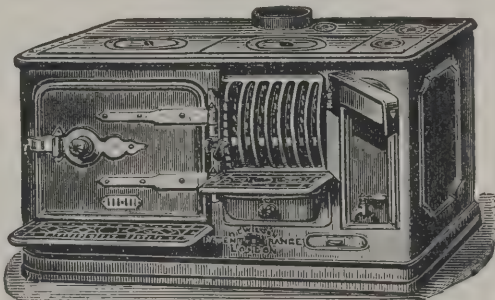
Professor Kirkpatrick, referee of the Edinburgh and Leith Masons' Conciliation Board, has issued his award, fixing the wages of the operative masons at 8½d. per hour, as from 15th inst. In note appended he says:—"In the Advocates' Library on March 20 last the case for the master builders, who seek to reduce the present rate of wages by one halfpenny per hour, viz. from 8½d. to 8d., was stated by Mr. John Sutherland, secretary of the Master Builders' Association; and the case for the operatives was stated by Mr. John McCallum. On both sides the case was argued with fairness and ability." After summarising the arguments and evidence submitted on both sides, he concludes with:—"I find it sufficiently proved (1) that the building trade here is in a depressed condition, being slacker than this time last year, and greatly slacker than at any time since the year 1888. (2) That while masons' wages rose to 9d. and 9½d. per hour last summer, and while trade was brisk and masons scarce, as at January 1 last, this apparent revival of prosperity was only temporary. (3) That masons' wages are at present more than ½d. higher in Edinburgh and Leith than the average rate in Scotland, and more than ¾d. higher than the average rate for the whole of Great Britain. These facts lead irresistibly to the conclusion that the present rate of wages must be reduced; but I have reduced the rate by the smallest possible sum, viz. ¼d. per hour, because there is reason to believe that a considerable overflow of work from last year remains to be done, and that part of it at least is of an unusually important character. The operatives of Edinburgh and Leith will still be paid more than the average wages earned by their brethren throughout Great Britain, while the reduction, though slight, will afford the employers relief to the

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appreciable extent of about 1s. per week. I have only to add that the parties conducted their respective cases with fairness and moderation, and I have no doubt they will abide loyally by the above decision. It can hardly be expected that either of the parties will view the decision with much satisfaction; but they will, I feel assured, bear in mind that it is the outcome of that beneficent system of conciliation and arbitration which averts the disastrous effects of less civilised methods of settling disputes."

Subsequently a mass meeting of Edinburgh and Leith joiners was held to consider the report and award. After considerable discussion it was agreed to approve the recommendation and accept the referee's decision.

THE SANDGATE LANDSLIP.

At the meeting of the London Geologists' Association, Mr. Wm. Topley read a paper on the subject of "The Sandgate Landslip." He said the geological conditions affecting the landslip were very simple. It was interesting to note that almost the whole of the line of coast from Hythe to Folkestone was a landslip. Sandgate, he said, was entirely built on an old landslip, due to the slipping of the clayey sands of the Sandgate beds, one of the subdivisions of the lower green sand. The recent slip was merely a renewed movement in the old slip. It was due to the great accumulation of water caused by the heavy rainfall of January, and to the fact that no provision had been made for underdraining the area. The eastern part of Sandgate had been drained by a deep land drain carried under the steep hill at the back of the undercliff. West of the town the land was also drained, and the recent slip commenced on the east exactly where the old land drain ends. The Sandgate beds underlie the Folkestone beds, and the explanation of the slips was that the water percolated through the Folkestone beds, soaked down into the Sandgate beds and saturated them, and was such a weight there was always a tendency to slips. In one part of Sandgate there were always slips at this time of the year; but as they did not do much damage not much was heard about them. It was quite a mistake to suppose there were no slips. Several houses had been removed from time to time as insecure because of these landslips. What little shingle came to Sandgate had been washed away, and he thought it was very likely that the taking away of this great amount of weight from the front of the shore had rendered it

somewhat more insecure. A very odd thing was that the landslip commenced, as a serious landslip, exactly at low-water mark on the evening of March 7. About six o'clock the next morning the movement recommenced at the next low spring tide, and it was reasonable to suppose that the want of support in the front of the shore had had something to do with determining the exact point at which the landslip took place. The blowing-up of vessels such as the *Calypso* and the *Benvenue* off the coast would render the ground a little bit insecure; but quite sufficient reasons for the slip were, he believed, to be found in other ways. The saturation of the ground due to heavy rains was a sufficient cause, and for this complete underdraining was the remedy.

BEQUEST TO WORKING-MEN.

A SCHEME for the application of the Proudfoot Bequest of over 20,000*l.* for the benefit of the working-men of Moffat was agreed to on Saturday at a meeting of working-men held in the Proudfoot Institute, Moffat, to consider the scheme proposed by the magistrates, who are trustees of the bequest, for the application of the income of the endowment. Provost Young, who presided, stated that as the bequest had been nearly all realised, the trustees had been, along with a committee of working-men, considering a scheme for the application of the income. Mr. Proudfoot's will only provided for a reading-room and place where temperance refreshments should be sold at cheap rates. As the trustees could not spend the income of the extremely large sum the bequest had unexpectedly amounted to on these things, they proposed to ask the Court of Session to sanction other matters for the benefit of working-men. On the Institute had been spent 1,800*l.* They proposed to enlarge and improve it at a cost of about 2,200*l.*, and to invest 7,000*l.* for its maintenance. They proposed spending 1,000*l.* in laying out a recreation ground and bowling green solely for working-men and their families, and to invest 1,000*l.* for its maintenance. The income of another 1,000*l.* invested would be given to Moffat Cottage Hospital, provided working-men are admitted for treatment free of charge. 3,000*l.* would be invested to provide temporary relief in time of sickness or want of employment or severe weather, to working-men and women who have resided five years in Moffat, and 3,000*l.* would be invested to provide pensions to old working-men or women who are natives of Moffat.



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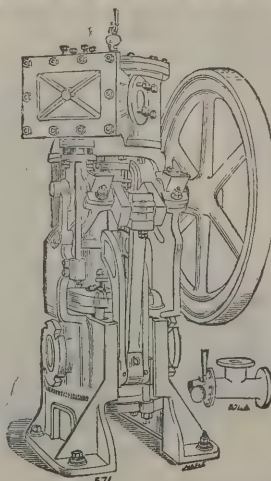
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SOCIETY OF ENGINEERS.

AT a meeting of the Society of Engineers held on Monday evening, Mr. William A. McIntosh Valon, J.P., president, in the chair, a paper was read by Mr. H. Conradi on "The Cleaning of Tramway and other Rails."

The author commenced by offering a few remarks with reference to street-cleaning appliances in general, and the conclusion arrived at by him was that they do not tend to keeping tramway rails clean, but rather the reverse. He then referred to the regulations enforced by some local authorities which compel the tramway companies to leave their lines in the muddy and dirty condition engendered by the general street traffic unless mud-collectors were used in combination with the apparatus for clearing the rails. He pointed out that, although the combination of a mud-collector with an ordinary street-sweeping machine had been condemned and abandoned, several local authorities still imposed this combination as a condition on the tramway companies when using rail-cleaning machines. He also showed how prejudicial to both animal and mechanical traction dirty tram rails were, and described several machines devised for effecting their clearance. These inventions, without exception, were of rigid construction, and, therefore, incapable of accommodating themselves to the inequalities of the track. They included the patents of Mr. Green, Messrs. J. & E. Townsend, Messrs. Rayner & Edwards, Mr. Dickinson, Messrs. Record & Jordan, Mr. Prosser and Messrs. Nobes & Jackson. The author then described his rail-cleaning machine, in which the principle of elasticity was introduced for the first time, and was combined with lightness of construction. The first apparatus constructed by him consisted of two tubes, each containing a vertical spring. In each of these main tubes was suspended an internal tube, leaving ample clearance for free play. To each of the inner tubes was fixed a leaf-spring, to which was attached the scraper-point and straight-plate, forming the cleaner. The lifting and lowering gear, carried on a cross-shaft, was worked by a connecting rod and lever from the driver's seat. After a private trial the apparatus was modified by making the scraper-spring a full coil, by making the scraping-steel and the shovel-plate separate and the latter of angular shape, and increasing the size of each. Triangular brushes were also added. The author then proceeded to point out the action of the cleaner, which he said was subjected at one and the same time to four constantly varying

conditions, viz. deviations and irregularities of the permanent way; lateral deviation of engine or car; vertical motion of engine or car, and the forward motion of the car or engine.

Describing the work this contrivance had to perform the author said:—Fine dry dust blown about by the wind, offering no great resistance to traction, should be removed by this apparatus only after the water-carts of the town have sprinkled the road and laid the dust. In other words, this apparatus should not be brought into use for dry dust, but be employed for dust only when the same has been slightly moistened by water. Mud, soft, sticky or greasy slush and snow are all readily removed by this contrivance. Mud which has been hammered in by the wheel flanges and has become very hard requires the scraper-points to run over it several times to cut it and then to remove it. In this case the scraper-points act like a pick, vibrating up and down, unless it is cut. For still harder mud or ice stronger springs have to be used. Obstacles wedged in, removable only by a chisel and a hammer, are not intended to be cleared by this apparatus, which is only constructed in accordance with the power available for tractive purposes. By means of the elasticity of the coil-spring, as also the given transverse motion of the shaft or the scrapers, the cleaner readily follows curves or an irregularity of the permanent way, and passes easily over joints, crossings, points, &c. A practical proof of this is afforded by its application to four cars at Reading which have now been working over eighteen months. It has also been fixed to other companies' electrical, cable and horse cars.

He then described several experiments made during the running of the cars, by which it was shown that the tractional resistance met with by a car running on rails cleaned by the previous car was from 25 to 30 lbs. less than when running on dirty rails. Not cleaning the rails, he said, was the cause of rapid deterioration either of horses or of any description of mechanical power used for traction, as well as of the rolling-stock, a fact generally known and admitted by engineers, managers and in some cases by the directors themselves. It was therefore difficult to understand why so little is done in this direction, and the cleaning of the rails so completely neglected. Horses or mechanical power and rolling-stock are permitted to run to destruction rather than provision be made for the proper cleaning of the permanent way. As electricity is rapidly coming forward for tractional purposes, and is specially cited as the cheapest method, the author maintained that for electrical traction clean rails are of the utmost importance,

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LIGHTFOOT, D. C., 104 High Street, Dunfermline, N.B.
PIERSON, W. R., 21 Orsett Road, Grays.
WHITE, J., 949 Bolton Road, Bradford.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

6414. George Henry Henn, for "Improvements in connection with window sash fasteners."
6429. Daniel Keith and John Keith, for "Improvements in and relating to fittings for windows."
6437. Ivan Pavlovitch, for "Improved means of hinging and fastening doors, windows and the like."
6461. Charles Guest Norris and George Henry Richmond, for "Improvements in apparatus for heating or cooling and ventilating buildings and other structures."
6519. William Louis Hulsembos Hamilton, for "A method for securing a key in lock by means of escutcheon."
6547. Hans Lauritz Hansen and William Walker, for "Improvements in ventilators."
6589. David Donald and John Sime, for "Improvements in ventilators."
6609. William Potter, for "The standard cap three-centred hinge."
6619. Michael Carthorn, for "Improvements in hand-sliding bolts for securing doors, windows, gates, wickets and other objects."
6643. Charles Coates, for "Improvements in apparatus for automatically closing doors, windows and the like."

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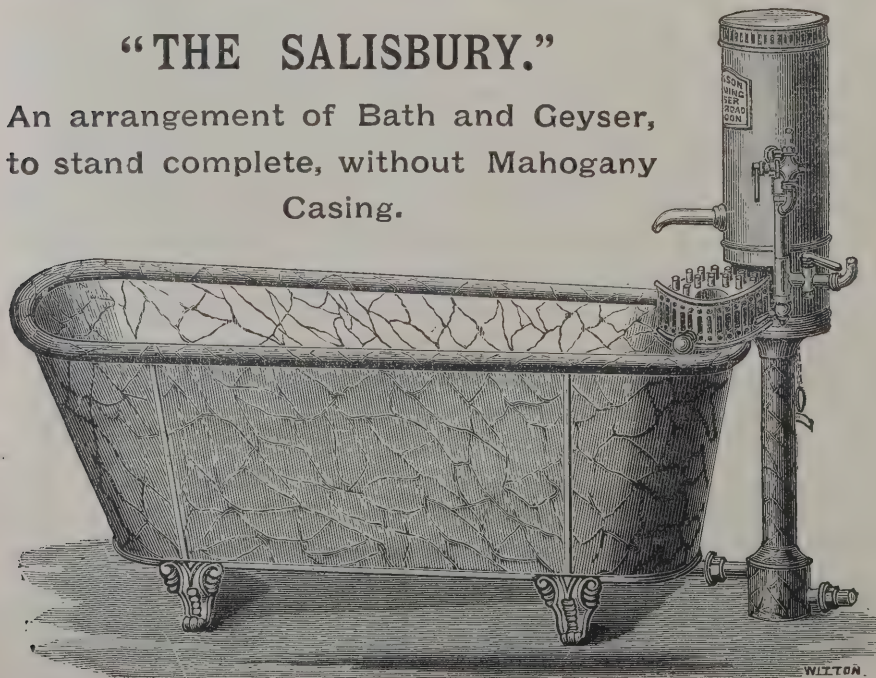
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CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr Matt. F. Blakiston, Clerk of the County Council, Stafford.

CONTRACTS OPEN.

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ABERGAVENNY.—For Building Six Semi-detached Villas. Mr. E. A. Johnson, Architect, Abergavenny.

ABERGWNFL.—May 1.—For Building Church. Messrs. Halliday & Anderson, Architects, 19 Duke Street, Cardiff.

ABERSYCHAN.—April 29.—For Additions to Board Schools. Mr. E. A. Lansdowne, Architect, Newport, Mon.

ATHLONE.—May 1.—For Constructing Waterworks. Messrs. Strype & Comber, 115 Grafton Street, Dublin.

AYLESBURY.—April 26.—For Building Waiting-rooms, Footbridge and Platform at Railway Station. Mr. G. K. Mills, Great Western Railway Company, Paddington Station, London, W.

BAILDON.—May 1.—For Building Six Terrace Houses. Messrs. J. Robertshaw & Son, Architects, 55 Tyrrel Street, Bradford.

BALLINGLASS.—April 22.—For Building Cottage and Chimney Stack and Constructing Sewers. Mr. J. R. Dagg, Clerk to the Guardians, Ballinglass, Ireland.

BARNLEY.—April 26.—For Building House. Mr. H. Crawshaw, Architect, Regent Street, Barnsley.

BARNSTAPLE.—April 27.—For Construction of River Retaining Wall, Laying Pipe Sewer, &c. Mr. H. Masterton, Engineer, Barnstaple.

BARRY.—May 8.—For Constructing Outfall Sewers. Mr. C. R. Walker, Local Board Offices, Cadoxton, near Cardiff.

BELFAST.—May 2.—For Constructing Low Level Sewer under River Lagan. Mr. Samuel Black, Town Hall, Belfast.

BISHOPSTON.—For Building Wesleyan Chapel. Mr Herbert J. Jones, Architect, 12 Bridge Street, Bristol.

BOSCOMBE.—May 6.—For Building Police Station. Mr. James Robinson, County Architect, 13 Southgate Street, Winchester.

BRADFORD.—May 1.—For Building Four Dwelling-houses. Mr. J. H. Cox, Borough Surveyor.

BUCKFASTLEIGH.—May 1.—For Building Chapel of Ease. Mr. C. G. S. Acock, Architect, Bridgetown, Totnes.

CAMBORNE.—April 22.—For Building Two Shops and Dwellings. Mr. James Hicks, Architect, Redruth.

CAMBRIDGE.—May 8.—For Building Guildhall. Mr. W. M. Fawcett, Architect, 1 Silver Street, Cambridge.

CANTERBURY.—April 24.—For Building Cottage for Sewage Farm Committee. Mr. F. Baker, C.E., Vernon House, Canterbury.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CARDIFF.—May 8.—For Extension of Infirmary. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CHELSEA.—April 26.—For Building Casual Wards. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

CHISWICK.—April 24.—For Constructing Road and Sewers. Messrs. F. & W. Stocker, 90 and 91 Queen Street, Cheap-side, E.C.

CORK.—April 24.—For Works at District Asylum. Mr. W. H. Hill, Architect, Cork.

CROMPTON.—April 29.—For Building Local Board Offices. Mr. Harold Cheetham, Architect, 87 Union Street Oldham.

CRUMLIN.—April 25.—For Building Twenty Cottages. Mr. T. C. Wakeling, Architect, Market Square Chambers, Merthyr Tydfil.

DUBLIN.—April 26.—For Supplying and Delivering Square Set Paving Stones. Mr. Spencer Harty, City Hall, Cork Hill, Dublin.

ENFIELD.—April 26.—For Building Boundary Wall. Mr. W. Kitteringham, Court House, Enfield.

EPSOM.—For Building Residence. Mr. J. Hatchard Smith, Architect, 41 Moorgate Station Buildings, E.C.

FULBOURN.—April 22.—For Altering and Enlarging School. Mr. I. Miller, Fernside, Fulbourn, Cambridge.

FULHAM.—April 26.—For Providing and Laying Creosoted Deal Blocks and Paving, Kerbing, Channelling, &c. Mr. J. P. Norrington, Town Hall, Walham Green, S.W.

GLASGOW.—April 24.—For Building Carriage Shed at South Side Station. Mr. F. H. Gillies, St. Enoch's Station, Glasgow.

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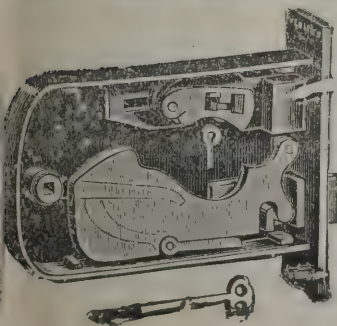
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GREAT HORTON.—April 22.—For Building Houses, Altering Existing Houses and Forming New Street. Mr. J. Drake, Architect, Winter Bank, Queensbury.

HACKNEY.—April 26.—For Supplying Broken Granite. Mr. James Lovegrove, Town Hall, Hackney, E.

HAVERSTOCK HILL.—April 24.—For Building Administrative Block, &c., at North-Western Fever Hospital. Mr. T. Duncombe Mann, Norfolk House, Norfolk Street, Strand, W.C.

HEREFORD.—April 26.—For Altering School. Messrs. Nicholson & Son, Architects, Hereford.

HESSLE.—April 27.—For Building Police-station. Mr. A. Beaumont, County Surveyor, County Hall, Beverley.

HEYWOOD.—May 1.—For Building Technical School. Messrs. Woodhouse & Willoughby, Architects, 100 King Street, Manchester.

HOLY ISLAND.—April 29.—For Taking-down and Rebuilding Hotel. Mr. M. I. Wilson, Architect, 53 Narrowgate, Alnwick.

HOOLE.—April 29.—For Building Local Board Offices, House, Stables, &c. Mr. C. A. Ewing, Architect, 29 Eastgate Row North, Chester.

ILCHESTER.—May 1.—For Pulling-down Victoria County Bridge and Building Iron Bridge. Mr. A. J. Goodford, Chilton Cantels, Ilchester.

KELVEDON.—April 27.—For Building School. Mr. Fred Chancellor, Architect, Chelmsford.

LEEDS.—May 3.—For Building Thirty-four Houses. Mr. C. N. Wilkins, North-Eastern Railway Company, York.

LEITH.—May 10.—For Construction of Reclamation Embankment on Foreshore, and Wet Dock Graving Dock, and Relative Works on East Side of Harbour. Sir Alex. M. Rendel, Engineer, 8 Great George Street, Westminster; or Mr. Peter Whyte, Engineer, Harbour Offices, Leith.

LIVERPOOL.—May 1.—For Repairs to Buildings for Three Years, for the Commissioners of Her Majesty's Works. Mr. H. W. Primrose, 12 Whitehall Place, London, S.W.

LLANELLY.—April 27.—For Building Parish Hall, Burry Port. Mr. W. Griffiths, Architect, Llanelly.

LLANTHONY.—April 28.—For Repairing St. David's Church, Mr. J. Spencer, Architect, 18 Monk Street, Abergavenny.

LOUGHBOROUGH.—April 26.—For Constructing Outfall Sewers. Mr. A. W. Cross, Municipal Buildings, Ashby Road, Loughborough.

MAIDSTONE.—April 22.—For Levelling Land for Cricket Ground. Messrs. Tootell & Sons, 13 King Street, Maidstone.

MALDON.—April 21.—For Building Shop. Mr. P. M. Beaumont, Architect, Maldon, Essex.

MARYPORT.—April 27.—For Mason and Joiner's Work of Five Dwelling-houses. Mr. C. Eaglesfield, Architect, Maryport.

MATLOCK BRIDGE.—April 27.—For Building Lock-Up, Inspector's Quarters, &c. Mr. J. Somes Story, County Architect, Market Place, Derby.

MIDDLESEX.—May 29.—For Supplying and Delivering Broken Granite to various Railway Stations, &c. Mr. F. H. Pownall, 9 Great George Street, Westminster, S.W.

OLDHAM.—May 4.—For Building Villa, Dobcross. Messrs. John Kirk & Sons, Architects, Huddersfield.

OSSETT.—April 21.—For Building Church and Schools. Mr. R. Castle, Architect, Westgate, Cleckheaton.

PENTRE.—April 29.—For Building Nave, Chancel, Aisle and Vestry, Rebuilding Old Nave of Parish Church. Mr. E. M. B. Vaughan, Architect, Cardiff.

PLAISTOW.—April 25.—For Constructing Stoneware Pipe Sewers. Mr. Lewis Angell, Town Hall, Stratford, E.

POOLE.—May 9.—For Building New Quay Wall, &c. Messrs. Kinipple & Jaffrey, 3 Victoria Street, S.W.

PORTSMOUTH.—April 25.—For Alterations and Additions to School. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

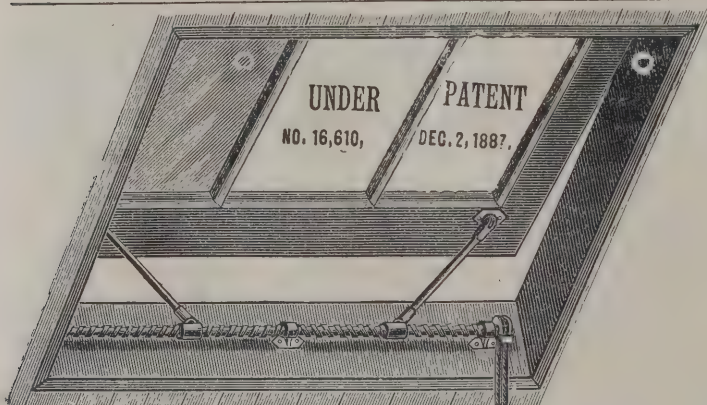
RYHOPE.—April 27.—For Building Asylum. Mr. G. T. Hine, Architect, 35 Parliament Street, Westminster.

SHEFFIELD.—April 28.—For Building Valve and Governor House. Mr. Hanbury Thomas, Sheffield United Gaslight Company, Commercial Street, Sheffield.

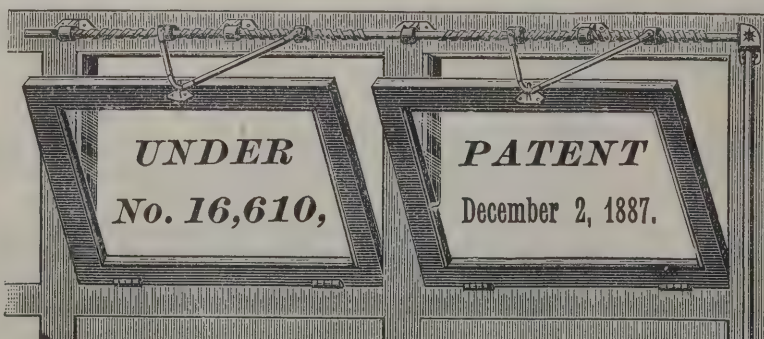
SLOUGH.—April 25.—For Building Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

ST. GEORGE-IN-THE-EAST.—April 27.—For Building Additional Chamber at Public Mortuary. Mr. H. Thompson, Vestry Hall, Cable Street, E.

SUNDERLAND.—May 27.—For Erecting Superstructure of Asylum. Mr. G. T. Hine, Architect, 35 Parliament Street, Westminster.



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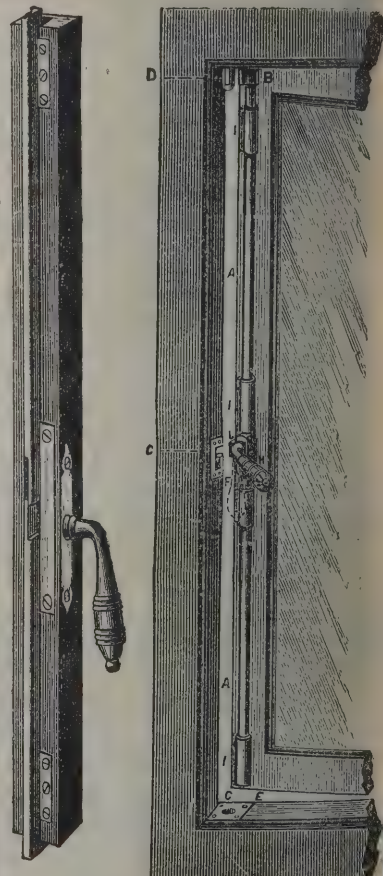
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TORQUAY.—May 2.—For Supplying Cast-iron Ornamental Railing and Gates. Mr. H. A. Garrett, Municipal Offices, Torquay.

WALSALL.—April 22.—For Building Public Baths. Mr. H. T. Bonner, Architect, 29 and 30 King Street, Cheap-side, E.C.

WILLESDEN.—April 25.—For Constructing Pipe Sewer. Mr. O. Claude Robson, Public Offices, Dyne Road, Kilburn, N.W.

TENDERS.

ALTRINCHAM.

For Alterations and Additions to Literary Institution, Altrincham, for Free Library, Reading-rooms and Technical Instruction Classes, for the Altrincham Local Board. Mr. F. POPPLEWELL, Architect, 87 Mosley Street, Manchester.

M. Stone, Altrincham	£4,320	0	0
S. Johnson, Irlams-o'-th'-Height, Manchester	4,313	0	0
J. Hamilton, Altrincham	4,307	0	0
W. LAMBERT & SON, Altrincham (accepted)	4,240	0	0
R. Campbell, Altrincham	4,205	0	0

BARNSELEY.

For Enlargement of Board School, Hoyland Common, for the Hoyland and Nether School Boards. Mr. W. J. SYKES, Architect, Hoyland.

M. A. Hague, Hoyland Common, mason	£624	0	0
H. Brearley, Hoyland Common, joiner	360	0	0
Firth & Sons, Hoyland, plumber	102	0	0
A. Calvert, High Green, slater	74	0	0
J. McPartlain, Platts Common, plasterer	25	0	0

BRIGHTON.

For Erection of a Public Abattoir in the Hollingdean Road, with Fittings, &c.

LONGLEY & CO. (accepted) £6,639 0 0

For Extension of Engine-house, Erection of Testing-rooms, &c., at the Electricity Generating Station, North Road.

J. T. CHAPPELL (accepted) £2,839 0 0

BEDDINGTON.

For New Hygienic Bakery at Old Wandle Mills, Beddington, Surrey, for Messrs. J. & T. H. Wallis. Mr. HORACE T. BONNER, A.R.I.B.A., Architect, 29 and 30 King Street, Cheapside.

Dawson & Son, Beddington	£774	12	0
Stuart, Wallington	758	10	0
Humphries, Sutton	698	0	0
Burnand, Wallington	675	0	0
Trappitt & Batley, Beddington	672	0	0

BEVERLEY.

For Laundry Extension at East Riding Asylum, Beverley. Mr. A. BEAUMONT, County Surveyor.

G. Jackson & Sons, Hull	£1,185	0	0
Holden & Myers, Stalybridge	1,092	0	0
H. Greenlaw, Beverley	1,030	0	0
G. & R. Pape, Beverley	1,020	0	0
A. Moore, Scarborough	949	0	0
R. Potts, Beverley	937	10	0
J. CONSTABLE, Beverley (accepted)	882	11	10

BOURNEMOUTH.

For Building Hotel, Lansdowne Park, Bournemouth. Messrs. H. E. HAWKER & MITCHELL, Architects, St. Peter's Chambers, Bournemouth.

Tilsed	£1,991	0	0
Buckingham	1,950	0	0
W. Hoare	1,943	0	0
Masters & Knight	1,885	0	0
F. Hoare	1,809	0	0
Jenkins & Sons	1,794	0	0
Curtis	1,747	0	0
Bath	1,697	0	0
Lucas	1,695	0	0
ENTWISLE & COX, Bournemouth (accepted)	1,588	0	0

BURNLEY.

For 100 Yards of Timber Piling to the Bank of Pendle Water, at Wood End Sewage Farm. Mr. F. S. BUTTON, Borough Surveyor, Burnley.

R. Dean & Sons, Burnley	£280	0	0
W. Gradwell, Barrow-in-Furness	269	12	8
CLEGG BROS., Burnley (accepted)	259	3	8

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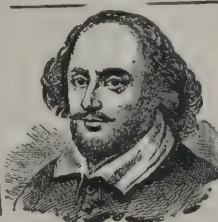
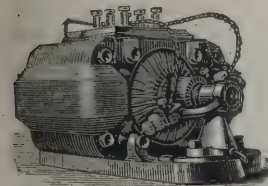
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Accepted Tenders.

J. Pollard, Burnley, ironfounder	£336	18	9
Clegg Bros., Burnley, joiner	333	18	4
Pickles Bros., Leeds, slater	141	6	0
J. Smith, Burnley, plumber	35	15	4

BURSLEM.

For Building Terrace Walls, &c., in the Borough Park, for the Corporation. Mr. F. BETTANY, Borough Engineer, Burslem.

W. Grant	£560	0	0
W. Cooke	544	0	0
N. BENNETT (<i>accepted</i>)	520	0	0
J. Windsor	490	0	0

For Building Lodge by Main Entrance to the Borough Park, Burslem, for the Corporation. Mr. F. BETTANY, Borough Engineer.

N. J. Bennett	£916	17	0
W. Grant	850	0	0
W. Cooke	816	0	0
N. BENNETT (<i>accepted</i>)	770	0	0
F. W. Jackson	730	0	0

DUNOON.

For Esplanade at Kirm and Slipway at Kirm Pier, for the Dunoon Police Commissioners. Mr. C. J. M. MACKINTOSH, Burgh Surveyor.

J. A. McBeth, Alexandria	£3,431	8	7
H. McDougall, Dunoon	2,859	11	9
J. Baire, Ayr	2,824	12	11
J. M. Pearson, Kilmarnock	2,782	17	6
R. C. Brebner, Edinburgh	2,578	18	6
D. Cunningham, Kilbarchan	2,561	11	6
M. Alexander, Glasgow	2,561	9	8
J. McFarlane, Partick	2,449	11	4
W. G. Flett, Glasgow	2,382	13	0
KERR & MELVILLE, Dunoon (<i>accepted</i>)	2,213	13	4

DARTFORD.

For Erection of a Male Staff Block, Patients' Discharge Block, and other works on shore at the Smallpox Hospital Ships at Long Reach, near Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

J. Ellingham	£3,395	0	0
Leslie & Co.	2,992	0	0
Wall & Co.	2,973	0	0
C. Miskin	2,790	0	0
W. JOHNSON & Co., Limited, Wandsworth Common (<i>accepted</i>)	2,483	0	0

CARDIFF.

For Building Pair of Semi-detached Villas, Dynas Powis, near Cardiff. Mr. W. H. DASHWOOD CAPLE, Architect, 1 St. John's Square, Cardiff.

Knox & Wells, Cardiff	£1,485	0	0
Stephens, Bastow & Co., Limited, Bristol	1,399	0	0
Jenkins & Arnold, Barry	1,195	0	0
E. C. Newby, Cardiff	1,125	0	0
H. J. Money, Barry	1,100	0	0
W. Richards, Barry	1,070	0	0
W. Rees, Dynas Powis	943	0	0

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Cooke & Co., Battersea	11,634	0	0
T. P. Hall, Portsmouth	11,600	0	0
H. J. Sanders, Southampton	11,000	0	0
Young & Son, Birmingham	10,594	0	0
F. Reek, Lymington	9,527	0	0
Morgan, Isted & Morgan, Southampton	9,436	0	0
CROOK & SON, Northam (<i>accepted</i>)	9,344	0	0

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W. Lewis, Blaenau	247	10	0
Hill & Smith, Brierley Hill.	246	0	5
W. A. Baker & Co., Newport, Mon.*	245	15	0
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For Alterations and Additions to Duchy House, Harrogate, for Mr. H. Mitchell. Mr. T. BUTLER WILSON, F.R.I.B.A., Architect, Leeds and Harrogate.
THOS. LINSKILL, Harrogate (*accepted*).

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For Erection of Five Terrace Houses and Boundary Wall in Deighton Lane, Healey, Batley. Mr. F. FIRTH, Architect, Dewsbury.

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Blackburn Bros., Heckmondwike, builder	£550	0	0
R. Charlesworth, Heckmondwike, joiner and carpenter	222	0	0
J. Lockwood, Staincliffe, plasterer	62	0	0
J. Thornton, Staincliffe, slater	49	0	0
J. Walshaw, Batley, plumber	37	0	0

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For Construction of Sea-wall, Groynes, Esplanades and other Works, near Medina Quarter Deck, for the Hove Commissioners. Mr. H. H. SCOTT, Surveyor.

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J. T. Chappell, Pimlico	11,783	0	0
J. Band, Grays	10,750	0	0
G. Lawson, Glasgow	10,199	0	0
J. Cochran & Sons, London	10,008	12	7
Wilkinson Bros., Finsbury Park	9,924	0	0
G. Bell, Tottenham	9,253	0	0
J. Parsons & Sons, Hove	8,549	0	0
W. HILL & Co., Gosport (<i>accepted</i>)	8,187	0	0
T. P. Hall, Portsmouth	8,074	0	0
Morgan, Isted & Morgan, Southampton	7,946	0	0
H. Weldon, Birmingham	7,664	0	7

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F. Messom, Nottingham	1,331	0	0
E. Stainforth, Hucknall Torkard	1,103	0	0
J. & R. STAINFORTH, Hucknall Torkard (<i>accepted</i>)	1,095	10	0

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For Repairs to be done to Houses, Nos. 124 and 126 Green Street, Bethnal Green, E., for Miss Bayley, High Barnet.
Mr. W. F. POTTER, Architect.

C. Smith, Herne Hill	£147	0	0
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For Repairs to be done to Seven vacant Houses, Licensed Victuallers' Asylum, Old Kent Road, preparatory to Election of New Inmates on May 25. Mr. W. F. POTTER, Architect.

W. J. WALKER, Poplar (*accepted*).

For Construction of Two Shelters for Patients at South Wharf, Rotherhithe, for the Metropolitan Asylums Board. Mr. T. W. ALDWINKLE, Architect.

T. & H. Higgs, Loughborough Junction	£1,999	0	0
W. Johnson & Co., Limited, Wandsworth	1,969	0	0
J. Mills, Stamford Street	1,896	0	0
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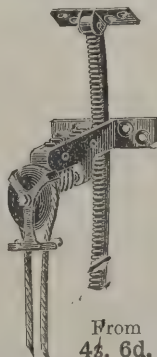
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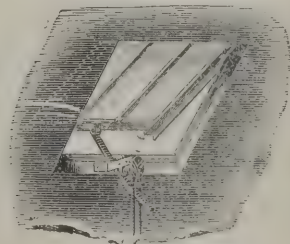
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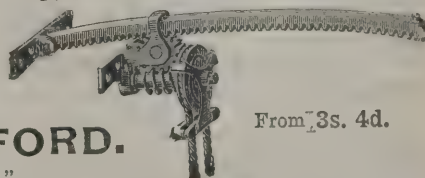
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Hart Bros.	55,000	0	0
Treasure & Son	53,320	0	0
C. Wall	52,042	0	0
J. T. Chappell	51,700	0	0
J. Allen & Sons	50,985	0	0
A. Kellett	45,021	0	0

For Building Diphtheria Wards at the Western Hospital, Seagrave Road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities by Mr. W. T. FARTHING, 46 Strand, W.C.

W. H. Lascelles & Co., Bunhill Row	£12,297	0	0
Bulled & Co., Croydon	11,646	0	0
F. G. Minter, Bridle Lane	11,490	0	0
C. Miskin, St. Albans	11,340	6	0
Wall & Co., Kentish Town	10,945	0	0
Leslie & Co., Kensington Square	10,691	0	0
W. JOHNSON & CO., LIMITED, Wandsworth Common (accepted)	10,487	0	0

For Erection of New Laundry Receiving-room and Ashes Shed, and making Alterations to the Mortuary at the Eastern Hospital, The Grove, Homerton, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

Barrett & Power	£671	0	0
Wall & Co.	620	0	0
J. EDMUNDS, Poplar (accepted)	542	0	0

MILLOM.

For Building Farmhouse at Whittriggs Close, Millom, for Mr. J. Atkinson, Beck Farm.

W. Tomlinson, Millom	£680	0	0
W. Bradley, Millom	629	7	0
H. K. RICHARDSON, Millom (accepted)	603	0	0

MACROOM.

For New Flooring, Seating and other Improvements to Macroom Church. Mr. D. J. COAKLEY, Architect, Cork.

J. Jorres, Dunmanway	£530	0	0
E. Sheehan, Macroom	508	0	0
J. McSweeney, Youghal	421	0	0
J. Sisk, Cork	415	0	0
MURPHY BROS., Macroom (accepted)	369	0	0
E. Coughlan, Macroom	348	0	0
Hallissy, Macroom	289	7	0

NORWICH.

For Erection of Schools for the Norwich School Board, at Avenue Road, Norwich. Mr. CHARLES J. BROWN, Architect and Surveyor, Cathedral Offices, Lower Close, Norwich.

Downing & Sons, Norwich	£10,544	0	0
G. E. Hawes, Norwich	10,300	0	0
Youngs & Son, Norwich	9,945	0	0
H. Lacey, Norwich	9,925	0	0
CHAPMAN & SON, Norwich (accepted)	9,694	0	0

PWLIGWAUN.

For Building Infants' School, with Outbuildings, Boundary Walls, &c., at Pwllgwaun, Pontypridd, for the Llantrisant School Board. Mr. J. J. EVANS, Architect, Penarth.

W. Seaton, Pontypridd	£2,997	0	0
L. Evans, Tonyrefail	2,900	0	0
J. Williams, Pontypridd	2,855	18	9
D. Jones, Trefoest	2,827	10	0
C. Jenkins & Sons, Perth	2,800	0	0
W. WILLIAMS, Pontypridd (accepted)	2,532	10	0
Architect's estimate	2,822	0	0

RICHMOND.

For Furnishing New Town Hall, for the Richmond Town Council. Mr. W. J. ANCELL, Architect, 3 Staple Inn, W.C.

F. Arthur, London	£3,068	12	0
Felix & Wayman, London	3,026	8	0
Gillow & Co., London	3,014	6	0
Lapworth Bros., London	2,483	6	0
WHITE, ALLOM & CO., London (accepted)	2,450	6	0

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Biggs, Wall & Co., London	£1,160	12	7
W. Coper, Halling, Rochester	1,053	12	8
L. H. Green, Dartford	995	10	3
J. Dierden, London	932	3	9
Hughes & Gotto, London	928	19	8
Millen & Chrisfield, Sittingbourne	873	0	3
Lodder & Sellers, Queenborough	809	6	11
W. R. Taylor, Rochester	805	8	0
J. Bligh, Eastchurch	797	1	5
G. PAVEY, Sittingbourne (accepted)	789	0	3
L. Seager, Sittingbourne	771	10	10

RANDWICK.

For Works at Parish Church, Randwick, near Stroud. Messrs. WALLER & SON, Architects, 17 College Green, Gloucester.

Hatherly & Carr, Bristol	£2,830	0	0
J. Freeman, Miserden	2,784	14	1
Drew Bros., Chalford	2,460	0	0
H. Welsh, Hereford	2,421	0	0
W. Jones, Gloucester	2,391	10	0
A. King & Sons, Gloucester	2,288	0	0
Wall & Hook, Brimscombe	2,133	0	0
F. Brown, Tetbury	2,088	0	0
English & Sons, Stroud	2,047	0	0
S. Cox, Lightpill	2,014	3	0
A. S. COOKE, Pakenhill (accepted in part)	1,844	0	0

ROSSENDALE.

For Building Board Schools, Waterfoot, Rossendale. Mr. THOMAS BELL, Architect, Burnley. Quantities by the Architect.

W. Coupe, Waterfoot, Rossendale, excavator.
J. Greenwood, Bacup, carpenter.
Tomlinson, Rawtenstall, slater.
C. Whitaker, Burnley, concretor.
R. Rawlinson, Burnley, plasterer and painter.
Lord & Hodgson, Waterfoot, plumber and glazier.
W. F. Spencer, Oldham, heating.
W. Walton, Burnley, gates and railing.
E. Wood, Manchester, ironfounder.

REIGATE.

For the Construction of Precipitation Works, Sludge-press House, Sewers and Incidental Works, Reigate. Mr. F. D. CLARK, Borough Engineer, Market Hall, Redhill.

W. Cunliffe, Kingston-on-Thames *	£11,584	0	0
Sludge-pressing Machinery, &c.			
Manlove, Alliott & Co. *	£2,953	0	0
* Recommended for acceptance.			

SHIRLEY.

For Building Board Offices, for the Shirley and Freemantle Local Board. Mr. H. J. WESTON, Surveyor.

W. Harvey, St. Denys	£1,580	0	0
H. Cawte, Shirley	1,495	0	0
Crook & Son, Northam	1,474	0	0
J. W. Rowland, Southampton	1,436	0	0
F. OSMAN, Four Post (accepted)	1,395	0	0
S. Golding, Freemantle (withdrawn)	1,195	10	0

SMALLBRIDGE.

For Construction of Two Precipitating Tanks, Two Filter Beds, and other Works upon Outfall Ground at Smallbridge, near Rochdale, for the Wuerdle and Wardle Local Board. Mr. J. T. WOOD, Engineer, Butts Chambers, Rochdale.

Kershaw, Rochdale	£1,612	14	1
Perkins, Graham & Co., Limited, Manchester	1,383	14	3
W. A. PETERS & SONS, Rochdale (accepted)	1,155	13	4
Engineer's estimate	1,160	0	0

THORNE.

For Alteration of Chapel, for the Trustees of the Methodist New Connexion Chapel, Thorne.

H. Kelsey, Goole	£443	0	0
W. H. Smith, Thorne	430	0	0
BARTON & MIDDLETON, Thorne (accepted)	416	0	0

TIMSBURY.

For Constructing Lime-settling Tank at Timsbury, Hampshire, for the South Hants Waterworks Company. Mr. C. M. BURNETT, Engineer, 24 Portland Street, Southampton.

H. Cawte, Shirley	£289	0	0
Wheeler & Son, Romsey	285	0	0
F. OSMAN, Southampton (accepted)	263	10	0
Engineer's estimate	269	10	0

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THORPE.

For Building Two Semi-detached Villas at Thorpe, Yorkshire, for Captain J. Hunter. Mr. ROBERT LENNARD, Architect, Cliff Street, Whitby. Quantities by Mr. J. J. MILLIGAN, Whitby.

Builders.

R. Harland, Whitby	£999	13	0
Cornforth, Hawaker	999	9	9
A. Palpaman, George Street, Whitby	991	0	0
C. Winterburn, Silver Street, Whitby	800	0	0
E. RUSSELL, Robin Hood's Bay (accepted)	735	0	0

Joiners.

Thos. Fletcher, Whitby	453	10	0
Coverdale & Lovighorn, Whitby	414	0	0
Cornforth, Hawaker	353	15	2
M. MENNELL, Robin Hood's Bay (accepted)	285	0	0

Plumbers.

Fisher, Whitby	170	0	0
Smithson, Whitby	141	0	0
Stephenson, Whitby	127	0	0
J. BROWN, Whitby (accepted)	101	2	0

NOTES ON NOVELTIES.

The "Sireon," the sole patentee and manufacturer of which is Mr. Milton Syer, of 36 Rye Lane, Peckham, is a combination of closet-pan, metal spreader, metal arm and two-gallon syphon cistern. The silent syphon cistern and closet-pan combination of metal arm and spreader with flush-tank. Perfect water waste-preventer, silent action, water-closet pan perfectly cleaned, force of flush directed where most required, trap cleared at every discharge, entirely new principle, no putty joints, no earthenware arm to break off by frost or flushing-rim to contract or warp in the kiln, and thus cause bad flush. This is a common fault with present system; hardly two closets flush alike. With this invention a perfect and regular flush is obtained with every closet. Each closet can be used with a right or left hand supply or straight, as the inlet arm is made bent and has a screw cap to fix in any position. No rubber joint, but arm is soldered to lead pipe, making a perfect and lasting connection, without any contraction of water-way.

TRADE NOTES.

THE well-known Grinnell sprinkler fire-extinguishing system has been lately fitted up in The Poplars, Avenue Road, Regent's Park, the private dwelling-house of Mr. Ludwig Mond. Mr. Mond being particularly anxious to have his house made as secure from fire as possible decided to adopt sprinkler protection, and he gave Messrs. Dowson, Taylor & Co. carte blanche to fit their Grinnell system in the most "risky" portions of the premises. As the interior decorations of The Poplars are of a rich and tasteful description, it was of course necessary to fix the pipes for the supply of the sprinklers in such a manner as not to cause disfigurement. This has been done, and the pipes and sprinklers carried along the ceilings have been decorated and give a not displeasing effect. In the upstairs portions of the house, to which the system may ultimately be extended, it is proposed to fix the pipes underneath the floors, and drop the sprinklers through the ceiling at intervals, in the same manner as adopted at Mr. William Whiteley's premises, Westbourne Grove. There the sprinklers are fixed in the centre of an ornamental rose-leaf, giving a pleasing effect to the ceilings of the various rooms. Grinnell sprinklers until lately have been only sought after for the protection of manufacturing risks, but they are now being adopted for the fire-protection of other descriptions of property, such as public buildings, theatres and private mansions.

MESSRS. LAING, WHARTON & DOWN, of 82A New Bond Street, W., have just received the contracts for electrical installations, or other electrical work, at the following places:—The business premises of Messrs. Mathias & Strickland, 23 Princes Street, Cavendish Square; additions at 34 Hyde Park Square; the premises of Mr. C. J. Phillips, 1 Eaton Square; the residence of Mr. G. Peck, 25 Chesham Place; the business premises of Mr. R. Douglas, 21 and 23 New Bond Street; the premises of Messrs. Henry Poole & Co., Savile Row.

NEW works are to be erected for the Dunfermline Gas Light Company, some of the contracts for which have been accepted at a cost of about 20,000*l*.

THE Hove Commissioners have accepted the tenders of Messrs. John Freeman, Sons & Co. to supply 1,800 feet of granite curbing at 1*s*. 5½*d*. per foot, and 1,800 feet of granite channelling at 1*s*. 3*d*. per foot; also to accept the tender of the Imperial Stone Company to supply 600 yards of artificial stone paving slabs at 5*s*. 3*d*. per yard.



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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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THE Streets and Buildings Committee of the Edinburgh Town Council have accepted estimates of footway and carriage-way repairs for the year ending May 15, 1894, amounting to over 10,000/.

It is proposed to obtain a faculty for erecting a chancel screen in Bromsgrove parish church. A sketch design has been submitted by Messrs. Jones & Willis.

THE Brighton Board of Guardians have accepted a tender of Messrs. Comyn Ching & Co., of London, for the erection of an improved steam cooking apparatus, capable of supplying 1,500 people, at the Brighton workhouse.

IN the advertisement for tenders for town improvements at Swansea which appeared in our last issue there was an error in the name of the architects. Tenders should be sent to Messrs. J. P. Jones & Rowlands, 58 Wind Street, Swansea, not later than the 26th inst.

THE hospital in connection with the East Poorhouse, Dundee, is being fitted throughout with heating steam cooking apparatus and laundry machinery by Messrs. Harper Twelves-trees, engineers, London and Manchester.

THE firm of White, Allom & Co., of 8 Mount Street, W., decorators and collectors of antiques for the artistic treatment of house interiors, have just secured an important contract for furnishing the new Town Hall at Richmond. The firm apparently have peculiar opportunities for carrying out good work on very reasonable terms.

VARIETIES.

AN inquiry has been held by the Local Government Board into the application of the Manchester Corporation for power to borrow 100,000/ for purposes connected with the collection, deposit and disposal of the refuse of the city. It was stated that the money was required for the completion of works at Carrington Moss, and for the provision of destructors, &c., at the various depôts in connection with the work of the cleansing committee.

AT Gorton an inquiry was held with reference to an application by the Gorton Local Board for powers to borrow the sum of 30,000/ for the purpose of constructing sewage works. It is proposed to treat the sewage by a system of chemical precipitation, subsequently passing it through filter-beds. The Manchester Corporation opposed the scheme.

AN inquiry has been held at the offices of the Swinton and Pendlebury Local Board into the application of that Board for sanction to borrow 1,443/ for works of sewerage. It was explained that the Board proposed to construct a main sewer from Chorley Road, Swinton, to Dale's Brow, by way of Worsley Road, to relieve the sewer in Chorley Road during heavy falls of rain.

THE Water Committee of the Carlisle Town Council have received a report from Mr. James Mansergh, the consulting engineer, with reference to a supply of water for the city by gravitation, in which he estimates the cost of the work at 210,000/.

AT the monthly meeting of the Yarmouth Port and Haven Commissioners it was decided, by advice of the engineer, Mr. Matthews, that the South Pier should be repaired, at a cost of 5,600/. A sum not exceeding 2,500/ is to be expended this year, and the whole work is to be completed within two years, in conformity with the recommendation of the late Sir John Coode.

A CLAIM made by the Greenock U.P. Church congregation for 1,000/ against the Caledonian Railway Company, for damages alleged to have been caused to the church by the tunnelling of Newton Street, has been submitted to Mr. W. R. Copland for arbitration.

AT the ninth general meeting of the Glasgow Association of Students of the Civil Engineers, just held, Mr. W. R. Copland, president, in the chair, Mr. James Young, jun., Stud. Inst.C.E., read a paper on "Underpinning in connection with the Central Railway Works." The following office-bearers for the coming year were elected as follows:—President, Mr. George Graham, M.Inst.C.E.; vice-presidents, Messrs. J. E. Harrison, John Cowan, and D. A. Matheson, Assoc.M.M.Inst.C.E.; hon. secretary, Mr. W. R. Copland, jun., Stud.Inst.C.E.; council, Messrs. Easton, B.Sc., Gale Venters, B.Sc., and Wilson, Stud.Inst.C.E.

THE Denbigh Town Council propose to borrow 4,500/ for the erection of a Smithfield Market.

AN interesting collection of fine old brass work from Thibe and Nepal, just received, is on view at Messrs. Howell & James's, Regent Street, Pall Mall, consisting of panas, hanging lamps, secundra, vases, incense-burners, water-bottles, gods and goddesses, indras, procession lamps, ink-pots and pen cases, tea-pots, bells, &c.

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[MESSRS. BODLEY & GARNER, ARCHITECTS.]

BATSFORD PARK, MORETON-IN-THE-MARSH.*
[MESSRS. ERNEST GEORGE & PETO, ARCHITECTS.]

VIEW IN RATISBONNE.

* From photographs by Messrs. BEDFORD LEMERE & CO.

ELECTRICAL.

THE introduction of electric light into Crieff is contemplated. An electrical engineer has lately visited Crieff and examined the water-power available, with the result, it is stated, that he considers that for an outlay of about 3,000*l.* an installation of about 600 lamps of 16 candle-power each can be secured, and if accumulators are used an additional outlay of about 2,000*l.* will be required; but in that case 2,000 lamps of 16 candle-power each would be obtained. It is reported that a splendid waterfall, ample for all purposes, may be placed at the disposal of the town if the scheme is gone into.

AT the meeting of the Worcester Watch Committee the electric-lighting question was again under discussion. Plans and estimates for the proposed buildings at the generating station at Powick were received and discussed in detail, and it was decided to recommend the City Council to apply to the Local Government Board for the loan of an additional sum of not exceeding 9,000*l.* for the purpose, repayable in thirty years. It was stated that the total expense of the installation of the electric light was inclusive of this estimate.

IN Edinburgh the Lord Provost's Committee approved of a sub-committee's report recommending that the Corporation should themselves undertake the carrying out of the powers conferred upon them under their electric lighting order. A memorial against the Town Council working the electric light order themselves has been largely signed by the Princes Street and other shopkeepers.

THE Gas Committee of the Carlisle Town Council have passed a resolution to the effect that, while keeping the matter under careful consideration with a view to taking action when desirable, they are of opinion that the time has not arrived for taking steps with respect to electric lighting.

BUILDING AND BUILDERS.

AT the meeting of the Derbyshire County Council a report recommending the erection of county offices at an approximate cost of about 15,000*l.* was adopted. The Council also sanctioned the expenditure of 24,000*l.* for the enlargement of the lunatic asylum.

THE *Leeds Mercury* says:—A month ago attention was drawn to the fact that the Building Clauses Committee had had before them and passed upwards of a hundred plans for buildings it was proposed to erect in the city. The members of this committee have had another busy day, when they passed a further batch of ninety-five plans.

THE Halifax Board of Guardians are negotiating for the purchase of about nine acres of land at Skircoat Green for the erection thereon of a new Workhouse Infirmary.

A COMMITTEE has been formed to raise money on behalf of the building fund of the Radcliffe Infirmary Buildings, Oxford.

A CHURCH is about to be built at Cogan on a site adjoining the main road to Penarth, given by Lord Windsor, who has also generously given 500*l.* towards its erection. Mr. J. S. Corbett, Mr. T. R. Thompson, and Miss Olive Talbot have also promised substantial subscriptions. The total outlay, including fencing of site, will be about 2,500*l.*, about 1,750*l.* of which has been promised. The contract has been let to Mr. W. Richards, contractor, Barry, and an excellent design in the Perpendicular style has been prepared by the architects, Messrs. Kempson & Fowler, Llandaff. It is hoped that the work will be completed by December next.

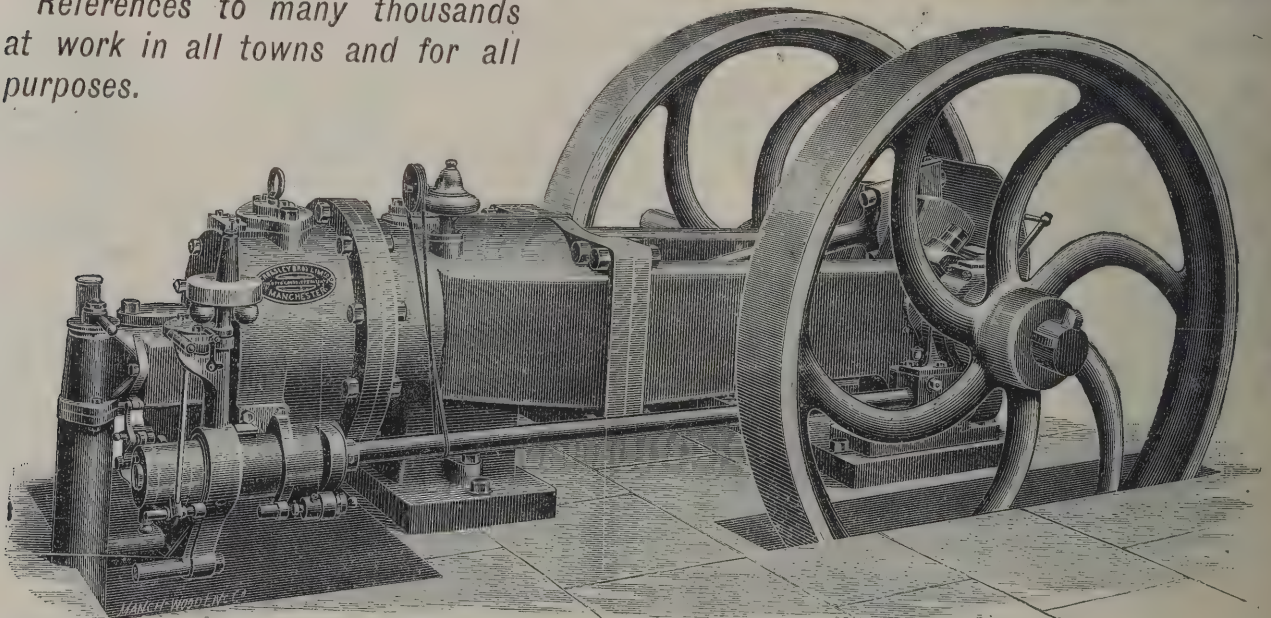
THE foundation-stone of a new Primitive Methodist Chapel, at Donaldson's Lodge, near Cornhill-on-Tweed, has been laid by Mr. F. D. Blake, of Tillmouth, who generously gave the site. The contractors for the building are Messrs. Elliot & Son, Berwick-on-Tweed, and they are carrying it out under the superintendence of the architect, Mr. George Reavell, jun., of Alnwick.

WORLD'S FAIR COIN.

THERE is considerable speculation as to how great a premium will be asked for the World's Fair souvenir coins when the issue is exhausted. It is generally known that a subsidy or grant of 2½ million dollars (2,500,000 dols.) was made by the United States Government to the World's Fair, and that it was decided that this donation should be made in the shape of

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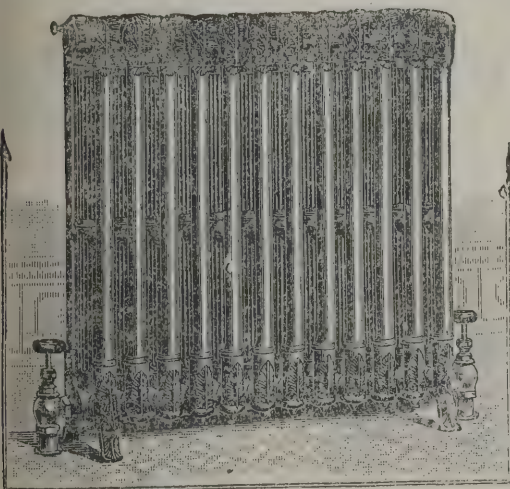
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5,000,000 souvenir half-dollar coins. Early last autumn, when it was announced by the managers of the Columbian exhibition that bids would be received for the disposition of the first souvenir half-dollar coined at the Philadelphia Mint, a well-known New York firm, desiring to contribute somewhat to the success of the great industrial enterprise, quietly submitted its offer of 10,000 dols. for the first perfect coin struck by the die. The bid being in excess of anything offered, New York receives this valuable and interesting souvenir, and the proprietors of the Remington Typewriting Company are to be credited, on New York's behalf, with this evidence of public spirit. This is believed to be the highest bid ever paid for any coin, modern or antique. Of the first lot of 10,000 of these half-dollars minted in Philadelphia, four were reserved as prize coins; the first, now the property of the firm just mentioned, the four hundredth as indicating the anniversary period now being celebrated, the number 1492 signifying the date of the discovery of America by Columbus, and number 1892 being that of the present year, or four hundredth anniversary. Columbus did not announce his great discovery to Isabella by means of lightning passing in a current through wires laid on the bed of the Atlantic Ocean, and then sit down and confirm his cable despatch of that date with a letter dictated to the operator of a typewriting machine. It was not until 1867 that the Remington Standard Typewriter was invented. In 1874 the Remington machine was first put upon the market. There are now in use in different parts of the world about 150,000 of the Remington Standard Typewriters.

THE MARSDEN TILE COMPANY.

THIS company has succeeded in producing beautiful tilework, as may be seen by works already carried out by them in London buildings, and also by inspection of samples of their work at their premises, 37 Walbrook, E.C. There is a large scope for beautiful work in tiles, where pictures, landscape effects, &c., are the aim, and this field has been widely worked with great success owing to the beauty of the pictures and work. The tilework of the Marsden Company, which we lately made a close inspection of as carried out by them, certainly deserves to carry off the palm for tilework, as it depends only on good design and colour properly applied for success. It may seem that we are over critical, but in this class of decorative tilework we have thought the weak point has too frequently been in the colouring.

Mr. G. W. Marsden, the managing director of the company, is, we understand, responsible for the colouring, and also for the designs, though architects' designs are also worked out to perfection. It would take too long to do more than allude to one or two points. Architects, artists, &c., will soon, if they see the work, be able to judge that Mr. Marsden is a master in the treatment of colour and all the various effects of contrast and blending that produce a wonderful harmony to delight the eye with beauty and restfulness. From first to last there is nothing discordant, the varied colouring of long corridors form one pleasing whole. The colours are deftly blended. Bright colour is not gaudy, but takes a natural place in a general scheme. Toned colours are not insipid or dead, but appear to brighten up the work in proper correspondence to the rest. Anyone interested in the use of tilework for decoration will find it worth their time to look at the corridors and staircases at Thanet House, 61 and 62 Gracechurch Street, E.C. The whole of these are carried out by the Marsden Tile Company, for Mr. H. H. Collins, architect. The dado work, in richly coloured majolica work, is beautifully designed in different colours, with honeysuckle pattern, the frieze above being an admirable reproduction of the architect's design. The filling above this to ceiling is, in colour, a beautiful light sage green, of alternate embossed and plain tiles, producing a very fine effect by this simple arrangement. The building has been thus tiled interiorly from top to bottom, and the length of corridors and height of staircase show off the beauty of the work to the full. The same character of work is carried out in the lavatories. A pleasing departure from the usual routine of printed notice-boards on the walls has been devised. Small panels enclosed in rich mouldings are used as indication-tablets, the lettering being executed in the Marsden decoration. In the whole of this work a little examination will be necessary to understand how the effective whole has been produced by delicacy of shading and of blending, and by other details that one is only accustomed to look for from among old masters or living artists, fully understand the mysteries of colour, and how to apply it. Other works carried out by the Marsden Tile Company are at New Broad Street House, E.C., Messrs. Davis & Emanuel, architects; 36 Essex Street, Strand, for Messrs. Hesketh & Stokes, architects, who since instructed the company to carry out the work also at 37 and 39 Essex Street. The work is more than creditable to so young a company, and in addition they have turned out not only artistic work, but work that is



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original, so that an observant eye is at once struck by seeing something out of the common. Aiming at this too frequently results in disaster. In carrying out extensive works there is a difficulty in keeping the tints exact. But nothing of this sort is perceptible in the Marsden tile work, however large the superficial area to be covered. We should mention that Mr. A. Wellesley Smith is the London representative of the company, 37 Walbrook, E.C.

THE LONDON COUNTY COUNCIL.

DISAPPOINTED in their expectation of being able to dictate to the Imperial Parliament what its duty is in the matter of such trifles as "unearned increment" and the great principle of "betterment," the London County Council at their meeting, the *Standard* says, resolved to withdraw the provisions relative to certain schemes included in their Improvements Bill, thereby bringing the outlay, originally estimated at more than five millions and a quarter, down to less than one million.

After criticising the schemes of the London County Council for raising money and consequent abandonment of improvements, the *Standard* adds:—But what kind of finance and what kind of common sense does all this exhibit? The Council rate is going up, and will continue to do so, yet improvements declared to be needful are arrested for lack of money. The plain truth is that the policy of the London County Council has plunged the finances of the Metropolis into confusion. There was a time when Thames Embankments could be built, when a costly scheme of main drainage could be accomplished, when such a thoroughfare as Queen Victoria Street could be laid out and other great works executed. The rates were not so heavy then as they are now, and yet all sorts of miserable schemes are being devised in order to delude the existing ratepayer into the notion that somehow he is being "relieved," whereas he finds that the process is rather the other way. The principle of "betterment" lurks in the present Bill, clearly based, as it is, on some "new rate, duty, charge or contribution," by which the Council want to be rescued from the financial quagmire into which they are daily sinking. The magnificent promises made when the Coal Duty was so confidently abandoned have not averted the inevitable result—that either improvements must cease or rates must rise. The case is even worse, for the rates rise and the improvements are

withheld. But what else can we expect from a London County Council of whose members no small proportion are men without experience, without ballast, without property and without one single qualification for the adequate and responsible discharge of the duties laid upon them?

CARVED FRUIT STONES IN CHINA.

IN China nothing is wasted. The stones of various fruits and the shells of nuts are cleaned, dried and carved into ornaments of the most graceful kind. Among the stones used are the olive, plum, peach and cherry, and of the shells the walnut and cocoanut. The stones are collected with care; each must exceed a certain standard of size, proportion, hardness and weight. They are dried slowly and at such a heat as not to crack or sprout, and are then ready for the carver. The designer makes a rough outline of the future group or picture, and hands it over to his boys or apprentices. These work with great rapidity, and soon block out the design, cutting through the hard ligneous tissue, and then extract the kernel. A second treatment now takes place to dry the interior of the stone, as well as to prevent the fine lining of the interior from undergoing decomposition. This completed, the designer sketches a second outline, and also indicates by his pencil or brush where the surface is to be manipulated, made into leaf-work or arabesque, or be cut altogether away. The work is performed by the subordinates, as at first. The designer then does the finishing touches, after which the assistants clean, polish and oil or wax the perfected carving. The stones are sold in this shape to quite a large extent, but more largely in other forms. Among these may be mentioned buttons, watch-charms, sleeve-links, earrings and brooches, and, when strung together, bracelets, anklets, necklaces, watch-chains, rosaries and official ornaments. The price of a stone varies greatly with the workmanship and the fame of the carver. Some may be bought as low as 5d. apiece, others command as high as 8s. and 12s. each. The average price is 1s. 3d. a stone, with a handsome discount for purchases in quantity. The carvings display great variety and beauty. One class represents bunches of flowers and leaves, in which pistils, stamens and tendrils are accurately executed. Similar to these are fruits and flowers, and flowers and leaves. A second class is composed of carvings of birds, reptiles and higher animals. The dragon, griffin, stork, horse,

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lion, tiger, camel, elephant and bull are the favourite figures. A canon in Chinese carving is to reproduce only those animals which have been deified, and those mentioned are about the only ones which have enjoyed divine honours. A third class, and by far the most interesting, comprises groups of human figures representing scenes in history, poetry, mythology and the drama. The workmanship is often so fine as to be microscopic in its delicacy. In fact, the finishing touches are made by the artist while using a magnifying glass of at least fifty diameters. On stones not over an inch in length along their major axis, it is not uncommon to find eight, nine and ten characters in different attitudes and costumes. Unlike most phases of Chinese art, there is much regard paid to perspective and foreshortening. Some of these pieces might have been made by Hindoo or Italian artists, so free are they from local conventionalism. Nevertheless, in the main, conventionalism is all-prevailing.

AN AMERICAN RESERVOIR DAM.

At the meeting of the American Society of Civil Engineers on the 5th inst., Mr. Walter McCulloh read a paper on the new Sodom Dam of the Croton Waterworks, in which he explained the use of wire cables as part of a contractor's plant.

The reservoir consists of two basins, joined by a 10-foot circular tunnel 2,000 feet long, through which the water passes from the basin which has the larger watershed into the Bog Brook basin, which has only $3\frac{1}{2}$ square miles of watershed, with a storage capacity nearly as great as the former, which drains 73.42 square miles. The combined storage capacity obtained in this manner is 9,500,000,000 gallons. Sodom Dam, which impounds the water in the larger basin, is of masonry throughout, and the Bog Brook Dam is of earth only. The Sodom Dam spans a gorge, and is 500 feet long at the coping line, which is 78 feet above the river bed.

Examinations at the site were made by test pits and borings in 1886. The dam crosses the valley at right angles to the stream, which here flows to the north, and at the site adopted the hill to the east showed an outcrop of hard gneiss rising abruptly 30 feet above water, with boulders and gravel at its foot. The rock back from this rose about 40 feet in 100, and was covered with a few feet of soil. The slopes on the west side were 15 per cent. at water surface, diminishing to 5 per cent. at top of dam; and the rock, which was from 4 to 10 feet

below the surface, was decomposed and shaly for a depth of about 15 feet. The rock in the river bed was solid, and was overlaid by a light deposit of sand and gravel. The ridge to the east, below the site of the dam, was parallel to the river and about 75 feet above it, and a dam of earth 600 feet long was constructed upon it to the height of the masonry dam, and at the north end of this earth dam is the spillway dam, which is a masonry wall 8 feet high and 500 feet long, with the lip 10 feet below the top of coping of the Sodom Dam and 6 feet below the flood line. After passing this the waste-water follows through an old water-course in a channel cut to the rock and between curved retaining walls.

The greatest height of the dam (above rock) is 98 feet, the thickness at bottom is 53 feet, and under the coping 12 feet. The total batter on the lower face is 37 feet, decreasing from 9.3 in 10 to 2.7 in 10. The batter on the back is 10 per cent. up to 38 feet below the top, and plumb above that point. The gatehouse is 37 by 42 feet, and rises 23 feet above the dam near the centre. This discharge is through two 48-inch pipes, which pass through the body of the dam. The work was begun February 22, 1888, and completed and accepted October 31, 1892, nearly three years after the date fixed by the contract.


The floods in the stream rise suddenly, and the discharge in a spring freshet reaches 250,000 cubic feet per minute. To control this during construction, a timber crib-dam was thrown across the river about 80 feet above the site of the work, and a canal cut 26 feet wide and 15 feet deep on the west side and around the work to a point 500 feet below. The gatehouse and eastern half of the dam were then built to about 25 feet above the discharge pipes, and in the dry season of 1889 the water was turned through the pipes and the other half of the dam started.

In preparing the foundation all loose rock was removed by dynamite, and afterward all loose seams or shakes by blasting with black powder and barring out. The foundation was swept with wire stable-brooms and washed clean. All pockets or holes were then filled with rich Portland cement concrete. A tighter bond it was found could be made with rubble consisting of small stones than with concrete beds. Water entered through several seams in the rock and would wash the mortar out of the concrete, but it could be led around the rubble beds until finally a small well 2 feet in diameter and 1 foot deep was formed at the point where the water boiled up. After the mortar had set the well was baled out and filled quickly with dry mortar, on top of this a bed of stiff wet mortar was laid

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and capped by a large rubble stone. After the first 6 feet of the rubble foundation had been placed there was no further trouble.

The dam for about 40 feet of its height is of rubble masonry laid in Portland cement mortar mixed 2 to 1. Above this there was facing stone, 30 inches deep, laid in 2 to 1 Portland cement mortar, backed with rubble in mostly 2 to 1 mortar. The rubble stones varied from a cubic foot to a cubic yard in bulk, and were laid in full beds of mortar. There were no through horizontal joints. Joints were filled with mortar, into which as many stone spalls were forced as was possible. All stone was washed before using. Sand and cement were mixed dry, and then wet only when required. All cement passed through a sieve of 10,000 meshes, and was carefully tested. All loamy sand was rejected. The face stone was a light bluish-grey limestone, cut rectangular, with rock face. Stretchers were 3 to 6 feet long by 30 inches wide, and headers 4 feet long. The thickness of courses diminished from the bottom up. The beds were at right angles to the face, and the stone had to be held in place with wooden blocks and wedges, to prevent slipping until the mortar had set, after which the blocking was removed and spaces left were filled with rubble. The dimension-stone was brought by rail from Wilmington, Del.

Stone-setting was done by the use of the cable, the traveller and derricks. The cable consisted of a $2\frac{1}{2}$ -inch steel-wire cable, stretched over and parallel to the dam, and over towers 67 feet apart, and anchored in the bedrock. On this a trolley ran which was worked by a double-drum reversible engine. A load of 10 tons would sag the cable 25 feet with a clearance of 5 feet above the coping. Most of the excavation was removed, and all material delivered on the wall in this manner. The cost of the cable erected was 3,750 dols. The first cable after fifteen months' use parted without warning, under a load of 6 tons, the break, in the author's opinion, being probably due to unequal wear at the point where stone and cement were hoisted. The towers were then raised 10 feet so as to lessen the tension, and a new cable supplied which lasted until the completion of the work. When the wall had reached a point 31 feet below the top, the standing derricks were replaced by a travelling derrick, mounted on a 30-foot trestle and running on a track of 36 feet gauge; a boom 55 feet long was used with this derrick.

The most serious flood occurred in November 1889, when 3·8 inches of rain fell in eighteen hours, and 8·7 inches during the month. In eight hours after the rain had ceased, the

water rose to 10 feet behind the dam, and in twelve hours to 15 feet, and poured over the top of the dam, although both 48-inch pipes were discharging to their full capacity. No serious damage followed, as part of the dam over the channel was kept 4 to 5 feet lower than the balance of the wall.

The final estimate for the dam and appurtenances was 436,499 dols. The lowest bid received at the letting was 366,990 dols.; the highest, 583,315 dols., and the engineers', 540,030 dols. The difference between bid and estimate was due to modifications in the plans.

The dam is watertight. With 68 feet of water behind it, no leaks whatever have been found, either through or under the wall, or around the ends. Sweating at the joints appears at points, but not so much as to cause a trickle, but it cannot be seen on a dry day. This very desirable result is due to the excellent materials used, the care in preparing the foundation, thorough cleaning of all stone, care in mixing mortar, breaking of joints horizontally and vertically, and close attention by the engineers to every detail. In addition to this the desire on the part of the contractors to do good work, and the existence of a proper relationship between them and the engineers were factors. The contractors were Messrs. Sullivan, Rider & Dougherty.

HAMMERING v. COGGING.

A CORRESPONDENT of the *Glasgow Herald* writes:—A very interesting discussion was ventilated at the shareholders' meeting of A. & J. Stewart & Clydesdale, Limited, as to whether hammering or coggling is the best process of preparing steel for plate purposes. Two well-known and prominent manufacturers were quoted, giving it as their opinion and experience that hammering had its advantages. It must be admitted that hammering, in the meantime, is absolutely necessary for forgings; but for plates—ship, boiler or bridge—steel is prepared by coggling and rolling, not only to give satisfaction to the designer or builder's requirements, but to command their implicit confidence in the coggled material and the practical test results. Take Lloyd's, Board of Trade or Admiralty requirements, and by hammering an ordinary piece of steel beyond certain conditions it will bring about rejection. As an instance, an ordinary piece of steel hammered out till it is practically forged would stand a most satisfactory bend and elongation test, but would exceed the maximum tensile tonnage,



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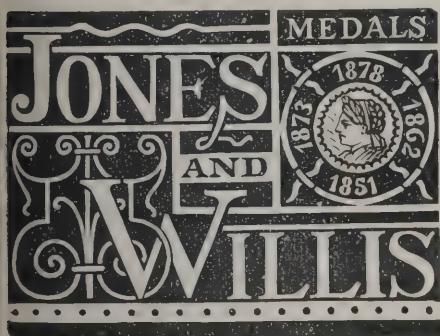
WORKS, ROTHERHAM. Estab. 1854.

and therefore be summarily rejected. A similar result would affect ship, boiler and bridge steel, as the elongation and tensile tonnage have slight, distinct, but important variations. One important factor in the manufacture of steel is this. When the metal is run in the ingot mould it must be free, to a certain extent, from impurities, and contain a proportion of carbon, according to the conditions and results it is intended to stand. This is the true chemical and practicable condition by which good or highest quality of steel is produced. The steel ingots must possess a due proportion of certain elements (which it is not necessary to specify here); if not, all the hammering that can be bestowed is futile and useless. Commencing with an ordinary quality of steel for plates, it is generally cast in moulds as near the size of the slabs desired as it is possible to work them. In the case where a large slab is required—when the ingot is laid on the anvil—it is often wider than the anvil, thus causing one-half of the blow from the hammer face to affect only one-half of the width of the ingot, and then with suspended hand-levers the other half is moved sideways on to the anvil. In this way it is flattened down and drawn out before it is edged, and, to put it plainly, the edging is only, and has never been much more, than a closing and squaring of the sides under the hammer. To edge one of these large pieces under a hammer is accomplished by putting a square hook on the piece of steel, with a short chain attached, and then, fastened to a projecting key in the hammer "tup," it is turned on edge with the rising of the hammer, and then requires great skill and unity of action on the part of the lever-men to manipulate it. But the effect of hammering an oblong flat surface has its drawbacks, because it is impossible to have an ingot free from hot scale, and every blow being struck and being received on a flat surface drives the scale into the skin of the steel. It must be borne in mind that slabbing means a succession of blows on the same spot to reduce and draw out the ingot before edging. Suppose the scale on the top surface is carefully removed, the surface next to the anvil receives blow after blow without an opportunity of removing it. Again, hammering is a quick, sudden shock, or an act of concussion, and its first effects are at the two points, where it is struck and the solid resistance. The result is that by hammering a large piece of steel is subjected to superficial effect first, before the heart of the steel is in the slightest affected. Forging is not to be confounded with slabbing for reasons it is unnecessary to touch upon meantime. Briefly stated, the conditions and effects of the latest improved cogging are:—A large steel ingot is handled without danger and

laborious skill; the steel is passed between two revolving forces, which are firmly fixed and cannot give way, and which give a uniform impression or compression on the full width of the piece of steel at the same time. The convex formed on the sides proves conclusively that the internal parts of the steel are being obviously affected; then, when the steel is edged, this convexity comes more prominently into contact with the compressive forces, and bears with it greater density to the heart of the steel. Then the revolving forces are circular; this breaks, lifts and carries off the scale from both surfaces. Every pass is presenting a clean surface for further compression, and this is the true art of improving the tenacity and ductility by the cogging and rolling process. Cogged steel for ship, boiler or bridge work as plates, bars or section can be produced of a more natural equality, through and through, than hammered steel, and is more easily worked and with less probability of fracture in the punching and bending of the builder to which the steel has to be subjected. Steel cogged from the ingots into plates or even rivet-bars can be made, and is made, to stand the bending strain, the tenacity and the stiffness to a degree more satisfactory and with less risk of creating a serious want of uniformity. Cogging has enabled the British manufacturer, and will still further enable him, to increase his output and to be satisfied with smaller profits. It shows him ready and willing to march with the times, and, what is more important still, to keep at bay the ruinous and foreign competitor.

LICENSED VICTUALLERS' ASYLUM.

A MARBLE tablet has been recently unveiled in the chapel of this institution, Old Kent Road, to the memory of the Rev. William George Martin, M.A., the first chaplain, who officiated there from the time of its erection in 1850 to the date of his death, April 9, 1892. The choral service was conducted by the Rev. W. H. W. Casely, the present chaplain, and the tablet was unveiled by Mr. John Coveney, the chairman of the Asylum. The memorial consists of a white statuary marble panel, 2 feet 6 inches by 2 feet, enclosed in ornamental framing of same material, supported on marble brackets, caps and bases, and Siena marble shafts, and four brackets over same, the whole surmounted by a pediment enclosing a carved tympanum consisting of a circular garter or ribbon and shield and scroll-work; on the shield is the monogram of the



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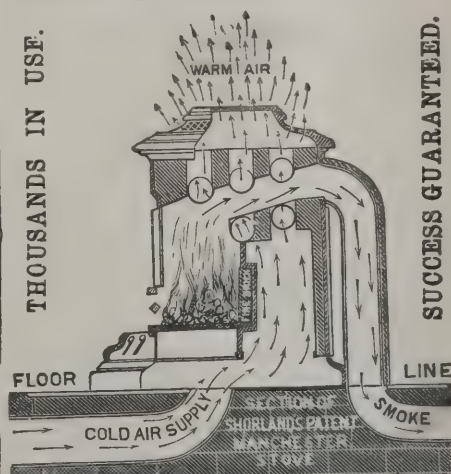
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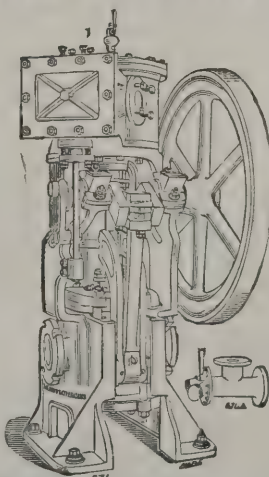
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deceased, "W. G. M.," the total dimensions being 6 feet by 4 feet. The inscription on the panel runs:—"To the memory of the Rev. William George Martin, M.A., of St. John's College, Cambridge, who faithfully officiated as chaplain to the Licensed Victuallers' Asylum from the opening of the chapel in 1850 until his decease. Born February 18, 1820; died April 9, 1892. This tablet is erected by supporters of this institution as a tribute to his Christian worth." The cost of the tablet was 60*l.*, exclusive of the inscription. The whole was executed very admirably by Messrs. H. W. Wilkins & Sons, monumental sculptors, of Pentonville Hill, from designs by Mr. W. F. Potter, architect to the institution, in Classic Renaissance style, to harmonise with the chapel and Asylum. At the conclusion of the service the company attended in the large board-room, when an oil-portrait, life-size, of the deceased chaplain, by Mr. W. Goodfellow, of 179 Regent Street, W., was also unveiled.

PUBLIC WORKS, VENICE.

THE following particulars are given in a report by Consul-General Sir D. Colnaghi, Florence:—

The long and narrow island which goes from north to south as far as Malamocco Harbour is called Lido. Pietro Giustiniano states that there were there two high towers older than Venice, which the Venetian writer Bernardo alleges to have seen with his own eyes, on one of which was engraved the following inscription:—

Adhuc stantem vidit etas nostra
Antiquissimam altitudinis eximie.

In 1053 the monastery and church of San Nicolo were constructed by order of the republic in which to place the remains of St. Nicholas, which are stated to have been brought to Venice from Myra on December 6, 1098.

The first record, now extant, of the port of Lido is a description of the departure in 998, on Ascension Day, of the Venetian fleet, commanded by the Doge Pietro Orseolo the Second, who subsequently defeated the Dalmatians and established the supremacy of Venice in the Adriatic. The Doge was honoured with the title of Duke of Dalmatia, and from that time forward the famous ceremony of the betrothal of the sea was celebrated every year on Ascension Day in the port of Lido. In 1202 the Pope, Innocent III., having proclaimed a new crusade against the Turks, an army consisting of 40,000 men, French and Flemish, arrived at Venice and camped at Lido.

About the end of the same year the Venetian fleet, under the command of the Doge Enrico Dandolo, consisting of 240 ships of war, 70 transport ships, 50 galleys and about 150 "palandre," left the Lido Port, with the troops on board, bound for the conquest of Constantinople. It is evident from the departure of such a powerful fleet that the Lido Port was at that time deep, wide and of easy ingress and egress. But in subsequent centuries the conditions of the port changed, as a decree was issued by the republic permitting ships to throw their ballast overboard before entering the Lido Port, in order to pass through it the more easily. In 1359, 1390 and 1391 vigorous attempts were made to deepen the port by means of barges and men and by making the mouth of the river Brenta flow into the port. In 1402, 1,000 men were employed to excavate a bank which had formed near the entrance of the harbour. But all the efforts were of no avail, as in 1541 only small craft could go out of the Lido Port. Gradually, however, the port was naturally deepened, and during the last period of the republic the galleys found easy entrance and exit through the Lido waters.

The works for reopening the Lido Port began, as may be seen from previous reports, several years ago. The construction of the north-east breakwater, which starts from the point of Treporti, was commenced in 1882. It is to be of the length to its extreme limit of 3,450 metres, of which 2,900 have already been constructed. The building of the south-west breakwater, which starts from the port of Lido, began in the month of March 1889. It is to be of the length of 2,850 metres, of which 1,450 metres have been completed. The two breakwaters jut out to sea, forming at their extremity a mouth 900 metres wide. The construction of the portions under water is of ashlar blocks of Istrian stone and "pietra Euganea," or stone from the hills in the province of Padua, while the upper parts are composed of large artificial blocks of pounded stone, lime and "pozzuolana" framed on the spot. About 1,500 metres distant from the seashore there is a bar running parallel to it. Owing to the construction of the breakwaters a channel was cut by the current through the bar about 5 metres deep at low tide and of a variable breadth from 100 metres to 250 metres. Two gas conical buoys have been moored at sea opposite the breakwaters to mark their extreme limits. The buoy marking the north-east mole exhibits a fixed red light of the range of 9 kiloms. (5½ miles). The buoy marking the south-west pier exhibits a fixed green light of the range of 7 kiloms. (4½ miles). Fort San Nicolo Light has been discontinued, and

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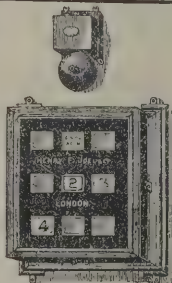
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the white bell buoy, previously marking the extremity of the north-east breakwater, has been withdrawn.

Although the works will not probably be completed before the year 1895, it is confidently expected that next year the Lido Port will be rendered navigable for the largest vessels. Two large Italian merchant steamers and an English steamship have already gone out of the Lido Port at high tide in charge of pilots. The estimate of the expenditure to be incurred when the works are finished is 6,000,000 fr. (240,000*l.*), but it is expected that a much larger amount will ultimately be laid out by the Italian Government. This important undertaking is carried on under the immediate direction of the eminent engineers Chevalier Carlo Perosini and Chevalier Cesare Spadon. All the Italian and foreign engineers who have visited the new port have expressed their approval of the high ability and success with which the works have so far been carried out.

The works for lengthening the principal quays, and the construction of new stores and other general improvements in the maritime station, have been continued most satisfactorily during the year. There is now sufficient accommodation for steamships discharging their cargoes alongside the moles in railway trucks. Two hydraulic steam cranes of a power of 20,000 kilos. (44,092 lbs. avoirdupois) and 12,000 kilos. (26,455 lbs. avoirdupois) respectively, with a cradle for lifting loaded railway waggons from off the rails, were erected in the month of December, 1891, and are now in operation. The quays have been supplied with 12 cranes running on rails, each of 1,500 kilos. (3,307 lbs. avoirdupois) lifting power, for loading and discharging heavy goods, and in addition there are now some small movable cranes in operation on the quay of the railway station for lifting goods from barges alongside the quay. In conclusion, the maritime station is now supplied with steam hydraulic cranes of great power, sheds, warehouses, railways, running close alongside the ships, and with every modern appliance necessary for a large shipping trade, and has become a dock of the first order.

It is a great security for the health of Venice that the water of the river Brenta, which was the source of supply of the town, has been abandoned. Owing to the river bringing down sewage and refuse matter the water was pronounced unfit for drinking purposes. The water now supplied to Venice through the aqueduct is derived from the springs of St. Ambrogio near Treviso, is conveyed to Venice from the mainland in a conduit placed under the lagoon, and is then distributed, to private houses and public wells, through underground pipes. Before the

year 1884 Venice was watered partly by the water of the Brenta, conveyed to the city in open barges, and partly by rain-water collected from the house roofs, in the "pozzi" or Venetian wells, where it was purified and drawn for use. The difficulty of obtaining drinking water at Venice, since time immemorial, made the Venetians very careful in the construction of their wells. It may not prove uninteresting in England to know how a Venetian well is constructed. It consists of a basin more or less wide, according to the conditions of the place, closed all round and at the bottom by a stratum of baked clay, which is placed on a slab of stone (piatto) laid on the clay. The pipe is constructed of circular bricks (pozzali) joined together with cement of pure clay and sand, to render them permeable, so that the water may pass through them into the pipe from the surrounding basin. The basin is then filled with marine sand to be taken from the dunes, and not with river sand which putrefies easily. The salt sand can be easily purified by frequently putting sweet water into the well and taking it out until all the sand is well washed and purified of its salt ingredients. In the inner part of the basin and all round the pipe are constructed the reservoirs (cassoni), in which rain water is collected through exterior perforated slab stones (sigilli). These reservoirs are also made of baked bricks joined together, like those of the pipe, with pure clay and sand to allow the water with which they are filled to percolate. They are covered with large plates of stone or vaults. One of the greatest difficulties in the construction of such a well is the selection of suitable clay. The quality of clay used here is obtained from the neighbouring moors. The clay must be worked in such a manner as to be rendered a soft mass without any heterogeneous substance, and laid on the subsoil with all possible care and skill. Even here, where all the wells are constructed in this way, few workmen are fitted for the work, and only special workmen are constantly employed. From the proper or improper moulding and laying of the clay depend the success or failure of a well. With regard to the St. Ambrogio water now distributed at Venice, it is most satisfactory to state that it is of a high degree of purity, needs no filtration, is cool in summer, and is entirely approved by all consumers. The municipality and the engineer, Chevalier Filippo Lavezzari, who represents the owners of the waterworks, deserve the greatest credit for the prompt solution of a question which was of paramount importance to Venice.

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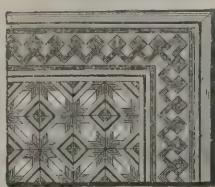
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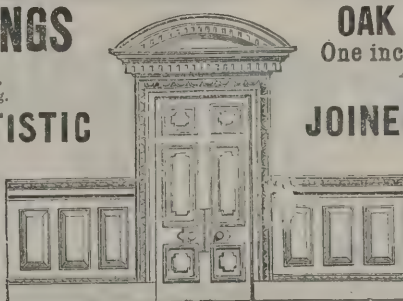
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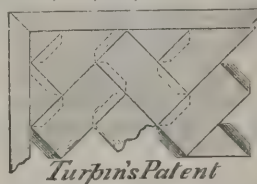
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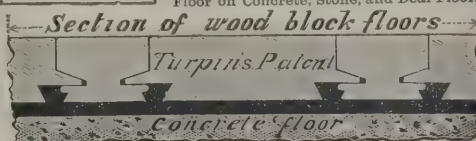
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THE HULL TRADES' UNION CONSPIRACY.

THE defendants in *Temperton v. Russell* and others having appealed against the verdict given against them at the Leeds Assizes, their case was heard before the Master of the Rolls and Lords Justices Lopes and A. L. Smith on Friday and Monday. The action was brought by a builder in Hull against the defendants, who were officers of certain trades' unions having branches there, to recover damages against them for injury caused to his trade by the defendants conspiring together to induce workmen to leave the employment of a number of builders who had entered into contracts with him for the supply of material unless those contracts were broken. The result was that in many instances the contracts were broken, and the plaintiff lost a part of his business. The case was tried at Leeds before Mr. Justice Collins and a special jury in March last, when a verdict was found for the plaintiff with 250% damages. The defendants now applied for judgment or for a new trial.

Mr. Robson, Q.C., on the part of the defendants, submitted that their action was perfectly legal. There was no evidence to show that the object of the defendants was to procure a specific breach of any particular contract.

The Master of the Rolls: The question was whether there was any evidence from which the jury might properly have inferred such an intention, whether the defendants used means to carry out their rules which went beyond the law.

Mr. Robson submitted that there was no evidence to support the inference that the defendants had intended to force the master builders to break their existing contracts with the plaintiff, and yet this special jury at Leeds had found a verdict for him for 250%.

The Master of the Rolls: A common jury would have found a similar verdict.

Mr. Robson thought that even a mixed jury would not have arrived at such a finding.

The Master of the Rolls: Why not? Do you think that a common jury would have been led by their prejudices to have found a dishonest verdict? In my experience common juries have always acted honestly in the teeth of their prejudices when their duty was clearly pointed out to them.

Mr. Robson said that even in the present case he believed that the jury had acted honestly, but he thought that they were mistaken in the conclusion at which they had arrived.

Mr. Tindal Atkinson followed on the same side on behalf of certain defendants.

Mr. Lawson Walton, on behalf of the plaintiff, said that this case had arisen out of a conspiracy that had been going on for a long time in Hull for the purpose of compelling the submission of certain building firms to the rules of the trade unions. The plaintiff was the brother of a member of one of these firms, and as he had declined to obey the order of the trade union that he was not to supply his brother's firm with building materials he had been signalled out to be blocked.

The Master of the Rolls: You mean to say that he was to be punished because he would not refuse to supply his brother with goods?

Mr. Walton said that was so.

The Court dismissed the application.

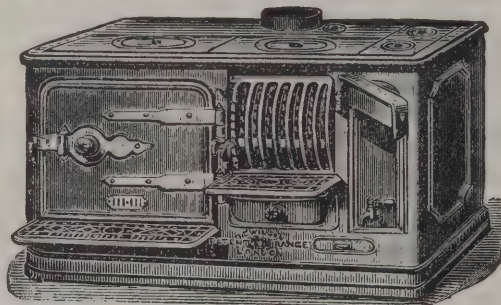
The Master of the Rolls said that he proposed first to state what he considered were the facts of the case according to the evidence, and then to state what was the law applicable thereto. The first thing to be noticed was the formation of the trade unions in the building trades in Hull. There were three trade unions in connection with the three trades which made up the building trade in Hull. The members agreed to form a union and to subscribe certain moneys, and, in consideration of each member so agreeing with the others, they all agreed to submit themselves to certain liabilities. Each member was to receive certain benefits, and agreed that if he did not comply with certain conditions he should forfeit those benefits. One of the main conditions was that, if a member was called upon to do certain things and refused to obey the orders given by those in authority, he would be expelled from the union, and would lose all benefits. That was probably the constitution of all trade unions, but, at any rate, the evidence here showed it to be the case of those trade unions. That being the case of the three unions, they decided that certain things should be observed by builders in Hull, and that, if persons did not conform to what they thought was good for their trade, they would take action through their members. The unions formed a joint committee, which was to be the authority to determine what the individual members of each of the three trade unions should do, and therefore the joint committee was the agent of each of the three trade unions to act for them, and the joint committee delegated their authority, as they had a right to do, to Russell to act for them in the present case. Russell, therefore, became the agent of each union, and he was the person to direct the workmen to do or not to do certain acts. The joint com-

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mittee passed rule 9, and determined to insist upon compliance with it, and, as regards the members of the unions, they had a perfect right so to insist. They had no right, however, to insist upon anyone outside the unions complying with the rule or yielding obedience to it. It appeared that a firm named Myers & Temperton exercised their undoubted right to carry on their business in Hull as they pleased, and they carried on their business in a way not consistent with rule 9. The unions and the joint committee objected to this, and resolved to coerce Myers & Temperton to carry on their business in accordance with the rule, and they attempted to do so, and failed. They then thought that they could coerce Myers & Temperton by coercing other people who dealt with Myers & Temperton, and accordingly they tried to make the plaintiff, among others, refuse to deal with the firm. The plaintiff answered, as Myers & Temperton had already answered, that he was not bound by rule 9 and that he intended to carry on his business in his own way, and he refused to cease dealing with his brother's firm. The committee and the unions thereupon began to coerce the plaintiff into refusing to deal with Myers & Temperton. They tried to coerce him in the same way as they tried to coerce Myers & Temperton, by saying that, if any persons in this trade dealt with the plaintiff, their men would refuse to work for them upon any goods supplied for the plaintiff, and they thought thereby to coerce the plaintiff into submitting to their rule. The business result of that would be that the plaintiff's business would come to an end. They began accordingly to act upon persons dealing with the plaintiff, among others, with Brentano and Gibson. Russell, who was acting for the unions and the committee, knew that Brentano had entered into contracts with the plaintiff, and that he would enter into other contracts with him. Russell, knowing that, let Brentano know that if he dealt with the plaintiff he would come to harm in his business by reason of his workmen being called out. The words used by Russell to Brentano, coupled with the resolution of the committee, which was made known to Brentano, had for their object the preventing Brentano from carrying out his contract with the plaintiff, not for the purpose of injuring Brentano, but for the purpose of injuring the plaintiff in his business, and thus to force the plaintiff to agree to their rule. It was said that this was not an order to the workmen, but only a piece of advice to them, and that they could do as they liked. It was impossible to say that that was so. These workmen had agreed to obey, and if they did not do, so they would be expelled from the

union or fined, or both. It was an order, and an order which the workmen had undertaken to obey. It was an order by the delegate Russell that, if Brentano did the work for the plaintiff under his contract, his workmen were to leave, and in consequence his business and that of the plaintiff would be injured. The defendants therefore acted so as to force the plaintiff to obey them, and if he did not his business would be ruined, and they so acted with intent to injure him in his business. There was ample evidence that all the defendants authorised what was done by Russell. So also with regard to Gibson the same thing happened as with Brentano. The defendants dealt with Brentano and Gibson in order to injure the plaintiff, and as Russell was stated in evidence to have said (though Russell denied this) to "bring him to his knees," and to impose upon him a policy which they had no right to impose upon him. Those were the facts. What was the law applicable to them? The law was indeed hardly disputed, the great stress being to show that the facts did not make the defendants liable. The case of *Bowen v. Hall* showed that no distinction existed between the case of master and servant and other cases. This Court affirmed the judgments of the majority of the Court in *Lumley v. Gye*, and stated that merely to persuade a person to break his contract might not be wrongful in law or fact, but "if the persuasion be used for the indirect purpose of injuring the plaintiff or of benefiting the defendant at the expense of the plaintiff, it is a malicious act which is in law and in fact a wrong act, and therefore a wrongful act, and therefore an actionable act if injury ensues from it." That exactly applied to this case. The next question was whether there was any real distinction between forcing a person to break an existing contract and forcing a person not to enter into a contract. He could see no distinction whatever between the two. There was the same wrongful intent, wrongful because malicious. It had the same effect of injuring the person. The decision in *Gregory v. Duke of Brunswick* seemed to him to be an authority for showing that where persons combined together to do an act so as to injure a person an action might lie, though it would not be so if the act were done by one person. In *Mogul Steamship Company v. McGregor, Gow & Co.*, the House of Lords did not draw any distinction between the two. No doubt there was a difference between an indictment and an action. In an indictment the proof of the conspiracy was enough; in an action, damage to the plaintiff must also be proved. The jury here, upon the true construction of their verdict, found damage to the plaintiff,

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and then the judgment of Lord Bramwell in the Mogul case showed that the agreement to do the act was unlawful, and the damage made it actionable. That judgment seemed to show that an agreement to do an act, which if done by an individual would not be wrongful, if damage was caused thereby to an individual might be actionable. It would not be actionable if done by one, but the agreement made it actionable. That doctrine applied to contracts already made and to contracts not yet made. In the present case there was evidence that persons were prevented from entering into contracts with the plaintiff, and that damage was done to the plaintiff thereby. There was, therefore evidence upon both counts to go to the jury, there was no misdirection, and the verdict of the jury was the only one they could have given consistently with common sense. The application must therefore be dismissed.

Lord Justice Lopes said the broad principle was that if a man induced one of two parties to a contract to break the contract, intending to injure the other or to gain a benefit for himself at the expense of the other, that person committed an actionable wrong. A contract conferred upon the parties to it certain rights, and it imposed upon all the world the duty of respecting that contractual tie. That being the law, there was abundant evidence to support the finding of the jury upon the first question. As regards the second question the jury intended to answer it fully in the plaintiff's favour. Was it an actionable wrong? In his opinion it was. The law was that a combination by two or more persons not to deal with a particular individual or not to enter into a contract with him, if done with intent to injure him, and if he was thereby injured, was an actionable wrong. There was evidence in this case to show that individuals were induced by the defendants not to enter into contracts with the plaintiff, and that the plaintiff was thereby injured. The verdict and judgment must therefore stand.

Lord Justice A. L. Smith said he did not think that an ordinary strike, which, since the Trade Union Act, 1871, was legal, was at all analogous to the present case. The present was a very different case to merely calling out men. There was evidence in this case—first, that the defendants intended to coerce Myers & Temperton to obey their edicts, and to bring this about they determined to cut off from them the supply of all materials they might require for their trade, and also the supply of men; secondly, that inasmuch as the plaintiff would not fall in with their edicts, the defendants then determined to cripple and injure him in his trade by inducing Brentano (together with others who were under contract with him) to

break his contract, which they well knew he had with the plaintiff, so that by these means the plaintiff might be coerced into obedience; and thirdly, that the defendants did induce Brentano to break his contract to the loss and injury of the plaintiff. Upon the first cause of action it was impossible to hold that there was not sufficient evidence to support the verdict of the jury, and in his opinion that verdict was right. As regards the second cause of action, namely, the conspiracy, the direction of the learned judge was right, and there was evidence to support the finding of the jury.

PATENTS.

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6991. Henry Lawson Hopkins, for "The pentagram improvements in stoves."

7034. George William Melvin, for "Improvements in fire escapes."

7090. James Arthur Thomlinson, for "Improvements in fireproof floors and ceiling."

7148. Charles Hepworth and Robert Robson, for "Improvements in fire-grates for domestic and other such-like purposes."

7155. Daniel Keith, for "Improvements in and relating to window-sash frames."

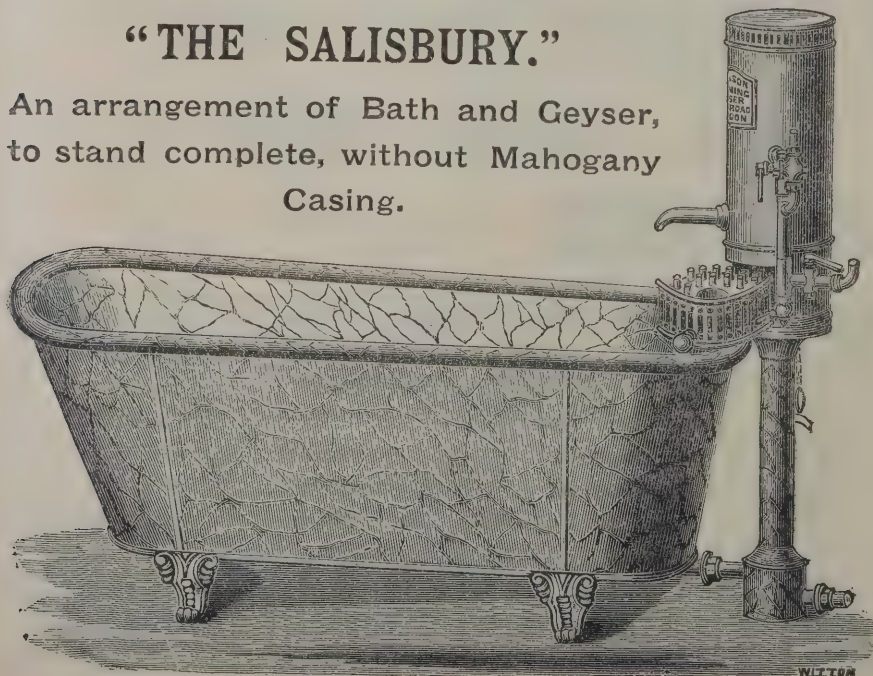
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COMPETITIONS OPEN.

CHADDLETON.—May 1.—Designs are Invited for Proposed Lunatic Asylum. Premiums of 200l., 150l. and 100l. Mr. Matt. F. Blakiston, Clerk of the County Council, Stafford.

LEEDS.—May 31.—Designs are invited for Public Baths. City Engineer, Municipal Buildings, Leeds.

LUDLOW.—May 30.—Prizes of 25l., 15l. and 10l. are offered for Schemes for Disposal of Sewage. Mr. John H. Williams, Town Clerk, Ludlow.

WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50l. and 25l. Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10l. Mr. Horatio Brevitt, Town Hall, Wolverhampton.

CONTRACTS OPEN.

ABERGWYNFI.—May 1.—For Building Church. Messrs. Halliday & Anderson, Architects, 19 Duke Street, Cardiff.

APERSYCHAN.—April 29.—For Additions to Board Schools. Mr. E. A. Lansdowne, Architect, Newport, Mon.

ATHLONE.—May 1.—For Constructing Waterworks. Messrs. Strype & Comber, 115 Grafton Street, Dublin.

BAILDON.—May 1.—For Building Six Terrace Houses. Messrs. J. Robertshaw & Son, Architects, 55 Tyrrel Street, Bradford.

BARMOUTH.—May 12.—For Constructing Waterworks. Messrs. Thomas Roberts & Son, Civil Engineers, Portmadoc.

BARNSELY.—May 3.—For Completing Arcade Buildings. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

BARRY.—May 8.—For Constructing Outfall Sewers. Mr. C. R. Walker, Local Board Offices, Cadoxton, near Cardiff.

BELFAST.—May 2.—For Constructing Low Level Sewer under River Lagan. Mr. Samuel Black, Town Hall, Belfast.

BOSCOMBE.—May 6.—For Building Police Station. Mr. James Robinson, County Architect, 13 Southgate Street, Winchester.

BRADNINCH.—May 26.—For Building Police Station. Mr. E. H. Harbottle, Architect, Exeter.

BRADFORD.—May 1.—For Building Four Dwelling-houses. Mr. J. H. Cox, Borough Surveyor.

BROCKLEY.—For Building Two Pairs of Villas. Mr. Walter Barnett, Winchester House, Old Broad Street, E.C.

BUCKFASTLEIGH.—May 1.—For Building Chapel of Ease. Mr. C. G. S. Acock, Architect, Bridgetown, Totnes.

CAMBRIDGE.—May 8.—For Building Guildhall. Mr. W. M. Fawcett, Architect, 1 Silver Street, Cambridge.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CARDIFF.—May 8.—For Extension of Infirmary. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

CARDIFF.—For Building Mission Hall, Houses and Shops. Messrs. Habershon & Fawckner, Architects, Pearl Street, Cardiff.

COLCHESTER.—May 12.—For Building Engine and Boiler House, Coal Store, Chimney Shaft, &c. Mr. C. E. Bland, 12 Crouch Street, Colchester.

CROYDON.—May 5.—For Building Ten Cottages. The Town Clerk.

CROMPTON.—April 29.—For Building Local Board Offices. Mr. Harold Cheetham, Architect, 87 Union Street Oldham.

EDGWARE.—May 6.—For Alterations to Infirmary. Mr. D. R. Soames, The Workhouse, Redhill, Edgware.

EDINBURGH.—May 9.—For Building Board School. Mr. R. Wilson, Architect, 3 Queen Street, Edinburgh.

EDMONTON.—May 10.—For Additions to Workhouse. Mr. T. E. Knightley, Architect, 106 Cannon Street, E.C.

FULHAM.—May 4.—For Supplying and Fixing Fifty-seven Cupboards, Western Fever Hospital. Mr. T. Duncombe Mann, Norfolk House, Norfolk Street, W.C.

GREAT YARMOUTH.—May 11.—For Building House. Mr. Sidney Rivett, Architect, 5 South Quay, Great Yarmouth.

HEYWOOD.—May 1.—For Building Technical School. Messrs. Woodhouse & Willoughby, Architects, 100 King Street, Manchester.

HOLY ISLAND.—April 29.—For Taking-down and Rebuilding Hotel. Mr. M. I. Wilson, Architect, 53 Narrowgate, Alnwick.

HOOLE.—April 29.—For Building Local Board Offices, House, Stables, &c. Mr. C. A. Ewing, Architect, 29 Eastgate Row North, Chester.

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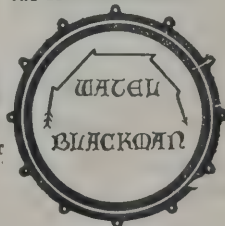
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ILCHESTER.—May 1.—For Pulling-down Victoria County Bridge and Building Iron Bridge. Mr. A. J. Goodford, Chilton Cantels, Ilchester.

LEEDS.—May 3.—For Building Thirty-four Houses. Mr. C. N. Wilkinsen, North-Eastern Railway Company, York.

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LLANTHONY.—April 28.—For Repairing St. David's Church, Mr. J. Spencer, Architect, 18 Monk Street, Abergavenny.

MIDDLESEX.—May 29.—For Supplying and Delivering Broken Granite to various Railway Stations, &c. Mr. F. H. Pownall, 9 Great George Street, Westminster, S.W.

OLDHAM.—May 4.—For Building Villa, Dobcross. Messrs. John Kirk & Sons, Architects, Huddersfield.

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PENTRE.—April 29.—For Building Nave, Chancel, Aisle and Vestry, Rebuilding Old Nave of Parish Church. Mr. E. M. B. Vaughan, Architect, Cardiff.

POOLE.—May 9.—For Building New Quay Wall, &c. Messrs. Kinipple & Jaffrey, 3 Victoria Street, S.W.

RISCA.—May 3.—For Building Baptist Chapel. Mr. Thomas Rowland, Architect, Market Buildings, Pontypridd.

SCARBOROUGH.—May 5.—For Building Timber-framed Firing Battery, Silent Battery, Drill Shed, Latrines, &c., for use of Royal Naval Reserve. Director of Works Department, 21 Craven Street, Charing Cross, W.C.

SHEFFIELD.—April 28.—For Building Valve and Governor House. Mr. Hanbury Thomas, Sheffield United Gaslight Company, Commercial Street, Sheffield.

SOUTHAMPTON.—May 9.—For Renewing Slopes of Two Reservoirs. Mr. W. Matthews, Municipal Offices, Southampton.

ST. ALBANS.—May 2.—For Supplying and Delivering Broken Granite. Mr. A. H. Debenham, Town Clerk, St. Albans.

SOUTHEND.—May 3.—For Painting Pier. Mr. William Gregson, Town Clerk, Southend-on-Sea.

STROOD.—May 11.—For Building Dining Halls, Kitchen, &c., at Workhouse. Mr. S. E. Bond, Architect, Rochester.

SUNDERLAND.—May 27.—For Erecting Superstructure of Asylum. Mr. G. T. Hine, Architect, 35 Parliament Street, Westminster.

TORQUAY.—May 2.—For Supplying Cast-iron Ornamental Railing and Gates. Mr. H. A. Garrett, Municipal Offices, Torquay.

TOTTENHAM.—May 2.—For Constructing Sewers. Mr. J. E. Worth, Coombes Croft House, High Road, Tottenham, N.

WANSTEAD.—May 5.—For Making-up Road. Mr. William Blewitt, Local Board Offices, Wanstead.

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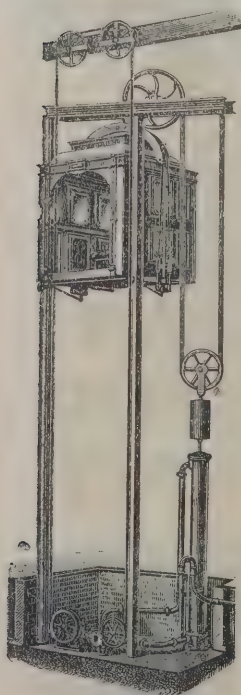
For Extension and Alteration of St. John's Church, Boxmoor, Herts. Mr. T. FOSTER WOODMAN, F.S.I., Architect.

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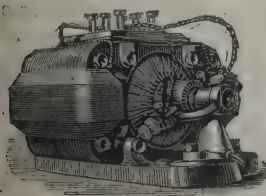
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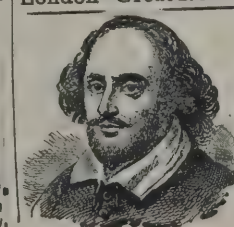
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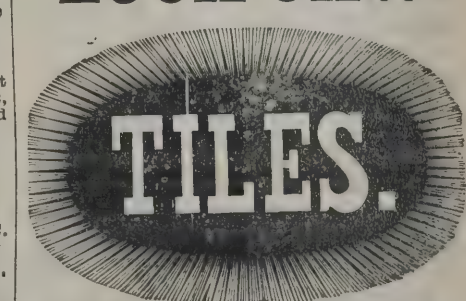
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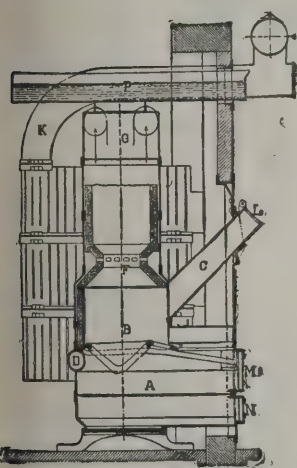
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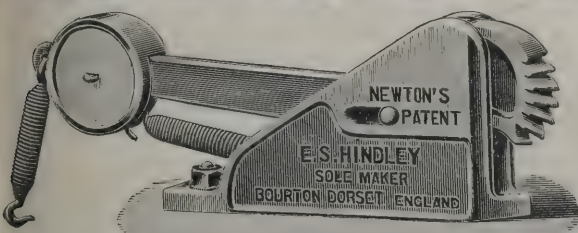
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Barnett & Co., Newcastle-on-Tyne	226	2	0
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H. Cawte, Southampton	1,182	0	0
Roe & Co., Southampton	1,075	0	0
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BUILDING AND BUILDERS.

THE Warwickshire County Council have decided on the enlargement of the Pauper Lunatic Asylum at Hatton, at an estimated cost of 38,000l.

At Halifax it is proposed to transform the Riding School, St. John's Lane, into a concert hall, erecting an orchestra, gallery, &c., and providing new approaches. There will be a large sitting accommodation, and it is believed the acoustic properties will be satisfactory.

THE Dee embankment, extending for some miles from Flint to Holywell, and beyond, has been seriously threatened at a point near Flint. Some time back the channel taken by the tide was found to be changing its course towards the embankment or cop. It first struck the refuse-tip of the Flint Chemical Works, and in the course of a few days washed away thousands of tons. It then ran against the embankment, and speedily the groins and foundations were exposed. This cop not only prevents the flooding of many hundreds of acres of land, but is the only barrier for the protection of the main line of railway

from Chester to Holyhead. The London and North-Western Railway Company immediately laid a trainway from their system right along the cop, and put on a large gang of men, who are strengthening the embankment with 100 tons of stone daily.

PLANS have been submitted to the Coventry School Board by Messrs. G. & J. Steane, architects, for proposed additions to Spon Street Schools, consisting of class-rooms for the accommodation of 120 children.

WHILE the rebuilding of St. Paul's Church at Palfrey, Walsall, is in hand, it has been decided at the same time to build a mission-room for the district, at a cost of about 900l. or 1,000l. A committee has just been appointed to carry out the work.

SOME forty or fifty stonemasons have come out on strike at Halifax. They were engaged on the new infirmary and the new markets, along with a small number of non-society men, and the strike is said to be due to the fact that the masters would not compel the non-society men to join the union.

THE thorough reparation of and rearrangement of seats, &c., in Clarboston Church, Pembrokeshire, has been desired for some years. Sir Owen H. P. Scourfield, Bart., and the rector of the parish have authorised the first instalments of the work, which was commenced this week. Substantial new roofs, of which the main beams will be oak, will be provided. The wooden windows will be replaced with stone traceried windows, glazed with strong ornamental glazing, and fitted with gun-metal casements. The seats, fitting, &c., will be done by instalments, as funds become available. The present contract will be carried out by Mr. G. Rowland Jones, Milford Road, Haverfordwest, under the direction of Messrs. Kempson & Fowler, of Llandaff and Cardiff.

At a meeting of the committee for the restoration of St. Mary's Chapel, Aberdeen, the report by the architects, Messrs. A. M. Mackenzie, A.R.S.A., G. G. Jenkins and William Kelly, was considered and adopted. The expense of the alterations is estimated at between 600l. and 700l. The Marquis of Huntly, in moving the adoption of the report, referred to the historical connection of the chapel with his family, it having recently been discovered that Elizabeth Gordon, the surviving daughter and heiress of Adam Gordon, founded and endowed the chapel, and lies buried within it; and that Sir John Gordon, a suitor for Queen Mary's hand, was also interred in the chapel.

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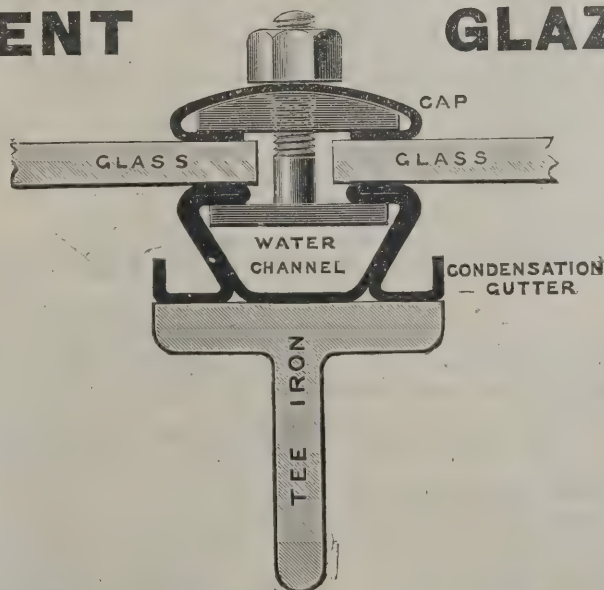
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Exeter Cathedral	Eddystone Lighthouse
Llandaff "	Birmingham Municipal Buildings
Wells "	Hove Town Hall
Sligo "	Burnley, Holy Trinity Church
Bradford Town Hall	Crawley Parish Church
St. James's Palace, London	Corbridge-on Tyne Parish Church
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[MR. J. G. FAIRLEY, ARCHITECT.]

* From a photograph by Messrs. BEDFORD LEMERE & CO.

VARIETIES.

THE general works sub-committee of the Coventry City Council recommend the erection of a refuse destructor on the ground at the rear of the new baths, at a cost of about 6,000*l*.

THE death is announced of Mr. Tom Gledhill, A.M.Inst.C.E., surveyor to the Heckmondwike Local Board, at his residence, Church Street, Heckmondwike. Mr. Gledhill was sixty-three years of age, and had held the appointment under the Board—originally as a working surveyor—for twenty-eight years, and under his direction the town's internal drainage scheme and sewage disposal works were being proceeded with.

CONSIDERABLE progress is being made with the extension of the Wet Dock at Alloa. One of the cofferdams has been constructed and the necessary excavations are being pushed forward, and when completed and the channel in front deepened, vessels of a greater draught than hitherto will be able to pass into the dock. Messrs. Young & Son, Edinburgh, are the contractors.

SATISFACTORY progress is reported by Messrs. Maxwell & Tuke regarding the erection of the Blackpool tower, which is now 203 feet 6 inches high, with the exception of a few braces. The rivetters are following up the work rapidly, and if all goes well the tower will be completed within the specified time. The electric crane, the first of its kind ever made, is lifting eighty-five tons a week. Up to April 22 the total amount of iron and steel erected was 1,613 tons. The buildings are being rapidly pushed on.

A LOCAL Government Inquiry has been held at Middlesbrough with reference to the application of the Tees Port Sanitary Authority to borrow 7,000*l*. for the provision of a

cholera hospital on the Tees. The hospital is to be similar to that on the Tyne, and will accommodate twenty beds.

AT a special meeting just held, the Runcorn Board of Improvement Commissioners decided to purchase the Runcorn, Weston and Halton Waterworks Company for the sum of 67,500*l*. The Commissioners propose to expend several thousand pounds in connecting the town with the Vyrnwy main of the Liverpool Corporation.

THE members of the York Architectural Association have just held the concluding meeting of the session, when a paper was read by Mr. John Ferguson, entitled "Strains in Girders, Roof Trusses, &c." The chair was occupied by the past president, Mr. A. Pollard. The lecture was illustrated by diagrams. A discussion ensued, and votes of thanks were passed to the lecturer and the chairman.

WE are reminded of the thoughtful enterprise of the Local Board for Hornsey in establishing a museum of sanitary appliances by receiving the excellent catalogue which has been prepared under the direction of Mr. T. de Courcy Meade, M.Inst.C.E., engineer to the Board. Mr. de Courcy Meade has also been asked to furnish explanatory notes, which will be issued in pamphlet form. This will make the institution doubly valuable as a factor in sanitary education. In addition lectures on hygiene have been promoted by the Middlesex County Council, and classes are held under the auspices of the Plumbers' Company.

A YACHT, built for the Prince of Wales, has been launched at Partick. The saloon has been decorated from the designs of Mr. T. L. Watson, F.R.I.B.A., Glasgow.

THE Worcester City Council have decided to borrow another 9,000*l*. for carrying out their electric lighting scheme.

A LAW has been passed, the *Engineering News* of New York says, by the New York State Legislature, appropriating 30,000 dols. for a topographical survey and map of the state, to be made by the state engineer, co-operating with the director of the United States Geological Survey. This appropriation of 30,000 dols. is for the present year. Of this amount, 6,000 dols. will be spent by the state engineer for determining and marking town and county boundaries, and 24,000 dols., with an equal amount from the United States Geological Survey (or 48,000 dols. in all), will be employed in making a topographical map of the state, similar to those already made of Massachusetts and Connecticut. There will be 5,000 square miles mapped this year, on a scale of 1 mile to 1 inch, with 20 feet

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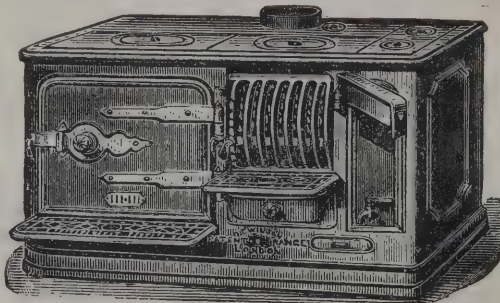
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WE are informed that Mr. W. E. Ommanney, of 185 Victoria Street, S.W., is now very busy in electric light installation work, the following works having been successfully completed:—Messrs. Hunt, Cox & Co., 29 Threadneedle Street, E.C.; Miss Anderson, 39 Craven Hill Gardens; White House, 15 Somers Place; 9 Radnor Place, W., for Mrs. Younghusband; the Old Three Tuns, 5 High Street, Kensington; Mr. F. Wilkins, 11 High Street, Kensington, and several extensive additions for large houses in the neighbourhood. Additions to 19 Kensington Court, for Mr. P. E. Singer; 28 Hyde Park Gate, for Lady Laffan; No. 1 Hyde Park Gate, for Mr. H. Edgell Hunt; No. 4 Queen's Gate, S.W., for Mrs. Alexander Staveley-Hill; No. 4 Palace Gate, W., for Mr. P. Hardy, &c. Victoria district.—Complete installation for 185 Victoria Street, S.W., for the Home of Rest for Horses, and for the Cabmen's Shelter Fund; additions and alterations for Messrs. Wilkes Bros., Buckingham Palace Road, S.W.

TRADE NOTES.

THE contract for the erection of the building of the Industrial Exhibition at Bristol has been secured by Mr. A. Krauss, of Bristol, for the sum of 9,985*l*.

THE County Buildings Committee report, just adopted by the Warwickshire County Council, recommended the acceptance of Mr. J. Bowen's tender for 8,160*l*. for the erection of new police courts at Aston.

VARIOUS contracts for the erection of a new mission church at Eldwick, near Bingley, have been let as follows:—Mason and joiner's work, Messrs. Wm. Ives & Co., Shipley; plastering, Mr. Henry Spurr, Bingley; slating, Mr. Wm. Thornton, Bingley; plumbing, Mr. John Hodgson, Keighley; painting, Mr. J. W. Anderson.

THE Gas Committee of the Leeds Corporation have accepted the following contracts for the ensuing year:—Stanton Ironworks Co., pipes; Messrs. Rhodes Bros., flags; Messrs. W. Hepton & Son, brass main cocks; Ribblesdale Lime Co., lime; Messrs. J. Bowling & Co., castings. The contract of

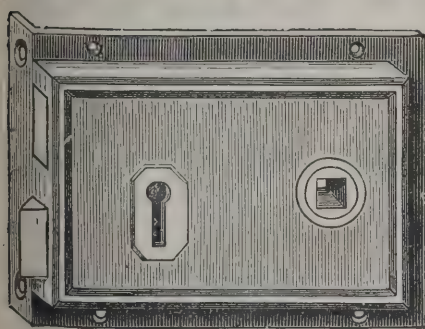
Messrs. J. E. Binns & Sons was accepted for the erection of a new governor house at Dewsbury Road.

THE Victoria Ironworks, Walsall, formerly carried on by Mr. H. Mills, and now the property of Messrs. Walker, of Dudley and Walsall, have been closed in consequence of the low price of iron and the high price of coal. The stoppage is only to be a temporary one, but nearly two hundred men are thrown out of employment by it, and other works in the neighbourhood are said to be contemplating a similar step.

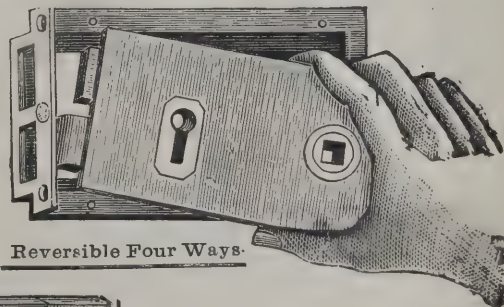
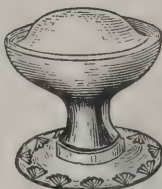
THE new offices for the *Morning Post*, London, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates and patent Manchester stoves, supplied by Mr. E. H. Shorland, of Manchester.

A NEW system of improved ship ventilation has recently been invented and introduced by Messrs. Baird, Thompson & Co., the well-known ventilating engineers, of London and Glasgow, which, having been subjected to the most severe tests, has proved so successful that it has already created quite a sensation in scientific and sanitary circles, receiving the approval and commendation of the highest authorities. In actual practice it has proved, if possible, even more successful, and one of the principal Atlantic steamship lines, after trying it on one of their vessels, have already adopted it for the whole of their fleet, instead of the existing systems, at a contract price of 100,000*l*. (one hundred thousand pounds). To well-appointed passenger vessels its application may only mean the additional luxury of an abundant supply of fresh air under all conditions; but to emigrant ships it is an absolute necessity, as with no system can the evils of over-crowding be so mitigated as to maintain a clean bill of health, by keeping the atmosphere 'tween decks in a constant state of purity. For cattle ships no system is so efficient and economical, as with it live-stock cargoes are greatly increased in value, owing to fewer casualties and to their arriving in better condition, while with fruits and other perishable freights the saving is enormous. For the "Baird-Thompson" system it is claimed that it is the most efficient, economical and reliable, and this, indeed, appears to be the case, seeing that even its opponents admit it is amongst the most satisfactory, and that it has many and decided advantages. A full description of the system and appliances is given in the catalogue Messrs. Baird, Thompson & Co. have recently issued dealing with ship ventilation, and in it is also quoted the opinions of our most prominent contemporaries, such as the *Times*, the *Lancet*, &c., all of which are highly favourable.

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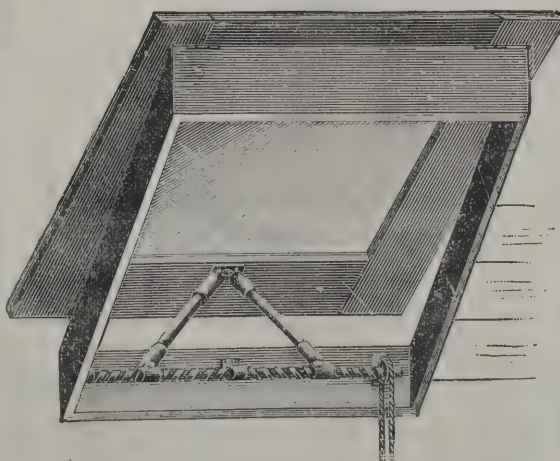


Reversible Four Ways.



Reversible Four Ways.

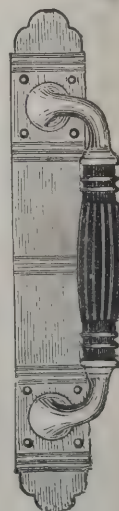
All kinds of Rim
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Skylights, &c.,
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PRICES AND PARTICULARS ON APPLICATION.

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MESSRS. LAING, WHARTON & DOWN, of 82A New Bond Street, W., have just received the contracts for electrical installations, or other electrical work, at the following places:— Extensions at the Devonshire Club, St. James's Street; the premises of Messrs. Willington & Pollard, 278 Strand; extensive alterations for Dr. Coffin, at Whitehall Court; Sir C. Tennant, Bart., 40 Grosvenor Square; Dr. Wingfield Bowles, 16 Upper Brook Street; an electric pumping plant, for Sir Philip Rose, Rayners; the Capital and Counties Bank, Limited, Threadneedle Street; Messrs. Peek, Winch & Co., 4 Fenchurch Street; Messrs. Turner & Hacon, Leadenhall House; the National Bank, Old Broad Street; the Eastern Telegraph Company, Old Broad Street; Messrs. Brunton, Bourke & Co., 18 Finch Lane.

MESSRS. BAIRD, THOMPSON & CO., of Queen Victoria Street, E.C., and Bath Street, Glasgow, the well-known ventilating engineers, have just issued their new illustrated price-lists, which are of a very artistic character and calculated to give the reader some idea of the inventions and improvements that the company has achieved in the present as in past years. Ventilation, a sanitary necessity, is brought by the efforts of Messrs. Baird, Thompson & Co. to a state of perfection, involving as it does no unsightly appliances. The ornamental turrets, of which we are favoured with a multiplicity of designs in nearly every style of architecture, are constructed to carry away heated and vitiated air from any building without down-draught, and are truly artistic and decorative. The quality of the materials and of the workmanship used in the carrying out of these designs is sufficient guarantee for their durability. The new turret ventilators possess another virtue, and one which will prove not an unimportant factor in the sum of their certain popularity, this is, their economy. Being, as these designs are, efficient, economical and decorative, we cannot be mistaken in predicting for them an assured, if not brilliant success, and we should advise any one who contemplates ventilating a building to send for one of Messrs. Baird, Thompson & Co.'s illustrated catalogues.

MESSRS. R. & W. WINFIELD, Limited, have appointed Mr. Seymour Cremen, late manager to Messrs. F. W. Reynolds & Co., of Southwark, to the charge of their London business from May 1.

DROYLSDEN SEWAGE DISPOSAL SCHEME.

SCHEMES for the disposal of the sewage of town after town in the Manchester district are being rapidly pushed forward, in view of the determination of the authorities not to allow pollution of rivers and streams falling into the Manchester Ship Canal.

A Local Government Board inquiry has been held by Mr. Samuel J. Smith, C.E., into an application of the Droylsden Local Board for sanction to borrow 28,000*l.* for works of sewerage and sewage disposal.

The town clerk of Manchester and the city surveyor watched the proceedings on behalf of the Corporation, but explained that they were not there to oppose the scheme. The clerk to the Local Board said that at present the sewage passed into a stream which emptied itself into the river Medlock, and they proposed to purify it in order to produce a comparatively pure effluent. The Board had visited several places to ascertain the best process, and with their medical officer of health came to the conclusion that to deodorise and precipitate with ferozone, and finally filter through polarite filters, would be the best.

Mr. Washington Hurst, engineer to the Board, entered into further details as regards the scheme, and stated that the outfall works would consist of six tanks, having a total capacity of 600,000 gallons, and eight polarite filters, with 3 acres of land below, which could be used if desired.

Mr. Hurst explained that without polarite beds the area would not be enough, but plus them it was quite sufficient. The site proposed for the outfall works is rather low, but the clerk stated that negotiations with a landowner in the district were in progress, which, if carried out, would obviate the difficulty. The scheme also provides for a destructor.

The inspector subsequently took evidence as to the borrowing of money for the purchase of land for a recreation-ground, cemetery and town's yard, after which the inquiry terminated.

The scheme proposed for purifying the sewage of Droylsden is the same as that adopted by the neighbouring Local Board of Gorton, who have also applied to the Local Government Board for a loan to carry out their works.

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House Cistern, fitted
with a Cistern Filter.

PATENT CISTERN FILTERS. Charged Solely with Animal Charcoal. Requiring, when once fixed, NO attention whatever, and superior to any others. Vide Professor Frankland's Reports to the Registrar-General, July 1866, November 1867, and May 1870. The *Lancet*, January 12, 1867.

Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

Price, £1 10s. and upwards.

Portable Filters on this System, £1 5s. to £3.

Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Bagshot Park, by H.R.H. the Duke of Cambridge, the Duke of the Medical Profession, and at the London, Middlesex, St. George's, St. Mary's, Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4s. 6d. and 6s. each. Household and Fancy Filters, from 10s. Water-testing Apparatus for detecting Impurities in Water, 10s. 6d. and 21s. each.

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Gold and Silver Picture Wire.

WIRE ROPES.

Established 1875. Telegrams:—"Orchard."



The illustration shows a heavy-duty metal filing cabinet with its lid open. The interior is organized into several sections. At the top, there are two large drawers labeled 'PRIVATE LETTERS' and 'RECEIPTS'. Below these are several smaller compartments labeled 'PAID GIVING ACCOUNTS', 'PAMPHLETS', and 'LETTERS'. A hand is shown placing a document into one of the compartments. The cabinet has a sturdy metal construction with a visible lock mechanism on the front. The lid is also labeled 'SAYLOR'.

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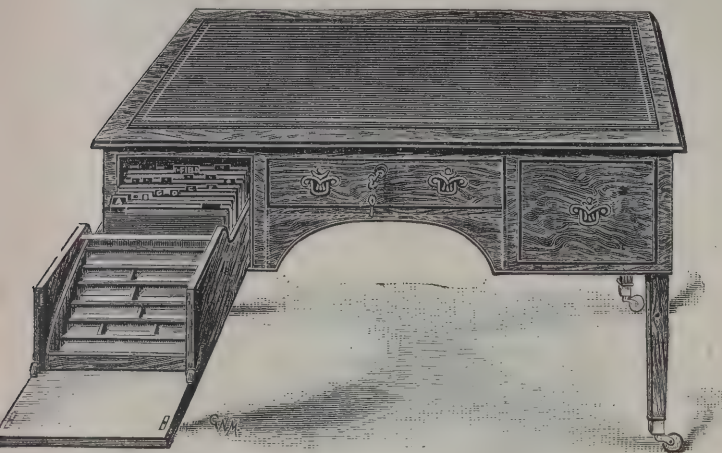
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reduce professional worries as much as possible to invest in one of the tables, and insure any amount of convenience and comfort. We would add that the boxes, cabinets, tables, &c.,



are highly finished; that the best Yale locks are used in them and that the price is extremely moderate. Mr. Bowater Vernon's offices are at Albany Buildings, 39 Victoria Street, S.W.

THE CENTRAL RAILWAY, GLASGOW.

By an arrangement between the Parliamentary Bills Committee of Glasgow Corporation and the Caledonian Railway Company with reference to the Central Underground Railway, the Corporation give consent to the company appropriating and enclosing the portion of the open space at the Cross for the erection of a station not exceeding one storey in height, the building not to occupy more than 100 square yards. The plans of the station are to be adjusted between the city engineer of Glasgow and Mr. J. J. Burnet, architect, and in case of

difference by Mr. James Thomson, architect. The Corporation also agree to the acquisition by the company for ventilating purposes of property on the south side of the Trongate, with the stipulation that on the street frontage they shall erect a screen wall of suitable height and architectural design to harmonise with the street façade of the new buildings of the Corporation in Trongate. The design is to be determined by the gentlemen already named. There is also a stipulation that screen walls be erected on the line of the street where any other properties are similarly acquired throughout the city for ventilating purposes. The Corporation agree to certain extensions of time for the completion of the railway, in return for which the company grant several concessions as to the street and other improvements.

A MODEL GLASGOW FACTORY.

IN days when the factory worker is hedged by Acts of Parliament and guarded by a Government Department from the evil effects of trade competition, some extra credit is due, the *Glasgow Herald* says, an employer who makes improvements beyond the contemplation of either. In the fitting-out of their William Street factory Messrs. Arthur & Co., Limited, have done this. They have reduced the danger from machinery to a minimum and vastly improved the place from a sanitary point of view—shown, in fact, exactly how much perfection in these respects is compatible with commercial success. The building is 280 feet long and 40 feet broad, and there are five floors and a basement; but as a central wall, fitted with fire-proof doors, divides the establishment into two sections, there are practically ten flats. To the hundreds who toil in these spacious apartments, fashioning garments for every description of mortal, Hood's famous poem is rather a pointless production. There is no weary stitching—hardly any drudgery here. Rows upon rows of sewing machines driven by steam, and deftly controlled by well-cared-for young women, rattle through most kinds of work at the rate of from 1,600 to 1,800 stitches a minute. Circular knives cut layers of material into certain shapes indicated in chalk on the uppermost lengths, and perform the work so expeditiously that the supply is oftener over than under the demand of the hundreds of workwomen.

Awards Obtained:—LONDON, 1862, 1874; PARIS, 1867, 1878, &c.

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Length, Fourteen Feet Seven Inches by Fifteen Inches deep.

A Splendid Example of Colour-Work in Permanent Ink Photo,
BY M. PAUL ALBERT BAUDOIN.

This magnificent Illustration was presented to the Subscribers to "The Architect" in 1886. A few Proofs were taken, which immediately became out of print.

P. A. GILBERT WOOD, 175 Strand, W.C.

Machines of the ordinary type with equal precision put the pieces together and, roughly speaking, give the things some form, and then they are passed over to where ingenious contrivances which represent the highest development of the sewing machine are constantly doing nothing less than slitting and finishing button-holes and sewing on buttons. Naturally, nothing is soiled in a process so purely mechanical, and the finished goods are as absolutely clean as the material was at the commencement. For certain manufactures of course a visit to the laundry is necessary, but even in that department the stay is of the briefest, everything possible being done there, as elsewhere in the building, to facilitate the process of production. With so much machinery in motion the danger to life and limb is obviously great, yet in Messrs. Arthur's establishment the possibility of serious accident is always remote. The pulleys, shafts and belts are protected in such a manner that a break anywhere could have no more serious consequence than a temporary cessation of work. The necessity, too, for stopping the machinery in an instant when danger is apprehended is provided for, the smashing of a small glass disc conveniently placed on the walls of the more important flats automatically bringing to a standstill practically the whole establishment. A reversal of the same electrical arrangement downstairs throws the engine out of gear instantaneously, and a governor, which ought to form part of the equipment of every engine, automatically prevents racing. On the boilers there is a remarkable arrangement styled a "steam loop," which tends to economise fuel by enabling the firm to re-use what would otherwise be waste steam. The principle embodied is certainly opposed to engineering practice, or engineering practice rather ignores it; but the invention exists and—Messrs. Arthur say—to some purpose. In striving in these directions to facilitate labour the firm did not lose sight of the fact that a great deal still depended on the provision of healthy quarters for their workpeople. Everything that could be done to make the place bright and sweet was done. Recently electricity as an illuminant displaced gas, and only the other day the Sturtevant system of heating and ventilating, which has proved highly successful in America, was introduced. Briefly described, the system consists in the massing of steam pipes in peculiarly constructed coils, and the locating of them, enclosed in steel-plate jackets, in the basement of the building or some other convenient point. The fresh air to be heated is taken from out of doors, passed by means of a Sturtevant fan across the surface of the steam coils, and then distributed in the building through

properly proportioned ducts built into the walls, or metal pipes provided for the purpose. Previous to being drawn or forced through the heater the air is passed through a filter screen in order to remove atmospheric impurities, and at this point, when circumstances render the process advisable, it is moistened and washed to increase in some degree the humidity, which will be affected by the rise in the temperature and also to procure absolute freedom from smoke or dust particles. As the air is introduced into the building under slight pressure all leakage is necessarily outwards—a feature which, considered in connection with faulty sewers and drains, is important from the sanitary point of view. In Messrs. Arthur's place the best arrangement possible was to lead a large vertical brick-built flue, narrowing as it passed each floor, and parted with a proportion of the heated air, from the fan-house in the basement to the attic floor on either side of the dividing wall. From these vertical flues air is distributed to each floor according to the number of workers on it. The displacement necessary to perfect ventilation varies, of course, with the nature of the employment and other circumstances, but it may be affirmed generally that no scheme is satisfactory which does not provide hourly for each worker at least 2,000 cubic feet of perfectly fresh air. In this factory there is accommodation for 1,000 workers, and the air which the heating apparatus is capable of supplying is considerably in excess of the quantity necessary according to this calculation. The apparatus has been supplied by the Sturtevant Blower Company, and consists of a fan 7 feet in diameter and 4 feet in width, driven by a direct connected engine with steam cylinders 7 inches in diameter and a 10½-inch stroke. The heater, which is made up of six separate sections and derives the whole of its heat from the exhaust steam of the main engine, consists of over 3,000 lineal feet of steam pipe, all enclosed in a steel-plate jacket, and together with the fan and engine, covers a floor space not exceeding 13 or 14 feet square. On winter mornings the fan is started half an hour before the factory opens, and with a temperature outside below freezing-point, the workers find themselves on entering the building in a comfortable atmosphere of about 60 degrees. This temperature is maintained with hardly any variation during working hours, and in that time the fan also discharges throughout the different floors a continuous stream of over two million cubic feet of pure warm air and displaces an equal quantity which has become vitiated. In every other respect, it is almost unnecessary to add, the factory is thoroughly and completely up to date.



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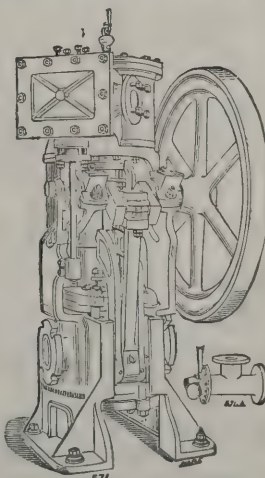
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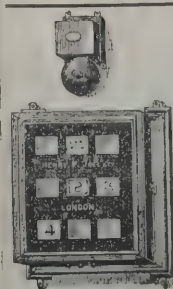
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MANSFIELD STONE,

FROM THE "LINDLEY" QUARRIES,
MANSFIELD.

A CURIOUS BOULDER.

A CORRESPONDENT of the *Manchester Guardian*, Mr. S. M. Morley, writes:—

It may interest many of your readers, and especially those who take a delight in geology, to hear that during the past week a boulder of considerable size has been unearthed at Eccles. The discovery was made by workmen engaged in digging for a foundation for a house, the site being at the top of Sandwich Road, Ellesmere Park. The owner of the premises is Mr. Willis, of Eccles. This erratic block, which is composed of granite, is about 27 cubic feet in dimensions, and weighs, perhaps, a little short of three tons. The granite is light in colour, owing to a preponderance of quartz—the felspar of a light reddish brown, the mica black. The stone, if polished, would present a very beautiful appearance, being bright and crystalline in structure. Those amongst your readers who are more or less acquainted with what rough outline geology affords of the past history of our earth will, of course, be able to conjecture by what mode of transit this boulder has got to the place in which it was found, even though the question "Where has it come from?" proves too much for them. Would that this "silent witness" of past ages had a voice to tell its own story, for its secrets must be such as neither poet nor philosopher ever dreamed of—more wonderful than any adventure we ever heard, more thrilling than any romance we ever read. For the convenience of those to whom the earth's past is a locked-up secret, I make the following remarks concerning the boulder of which I am writing. It is possible that this boulder once formed the head of some steep, towering pinnacle, situate, perhaps, on the Isle of Arran; or it may be that its ancient home was Criffell, and that for centuries it looked down upon what is now the Solway Firth. It is certain that during some part of the glacial period, possibly at a time when a vast glacier extended from the North Pole to England, and the greater portion of our island was covered with a thick coating of ice, this boulder, yielding to the attack of the elements, fell from its original position, and came to rest on the ice that lay beneath. This ice, shifting in accordance with glacial action, conveyed the boulder to the edge of the sea, and upon the ice breaking up under the influence of the increased temperature of the northern part of the globe the portion of the glacier bearing the boulder became detached and floated at large upon the

Irish Sea. At this time the whole of Lancashire would be lying beneath the ocean, and the iceberg conveying our boulder must have been carried by wind and current into the locality we now call Eccles. The iceberg, gradually melting, dropped its burden in the place where, during the present week, it has been found. I understand that Mr. Willis intends to offer the boulder to the Peel Park Museum Committee.

TALL BUILDINGS IN AMERICA.

ACCORDING to the *Engineering Record* the Masonic Temple, Chicago, has twenty floors above ground and a height from sidewalk to roof coping of 274 feet. The Pulitzer Building, New York City, occupied by the *World* newspaper and by offices, has twelve storeys above ground in the main structure, with a roof 191 feet above the sidewalk. On the top of this, however, is a six-storey dome, in which the highest standing room is 280 feet above the ground. The New Netherlands Hotel, New York, now approaching completion, will have seventeen floors, and reach to a height of 210 feet above the sidewalk. Among the newer buildings erected in Chicago are the Katahdin and Wachusett, each of seventeen storeys, and 200 and 205 feet high respectively from the sidewalk to the top of the roof. The Old Colony, another seventeen-storey building, will be 215 feet high from sidewalk to roof. The Hartford and the Ellsworth buildings, each of fourteen storeys, will be respectively 165 and 170 feet high from sidewalk to roof. The law relating to buildings in New York City imposes no restrictions upon the height of buildings for office purposes. An older law, limiting the height of dwelling-houses in New York City, prescribes their height in accordance with the width of the street upon which the buildings front. On streets and avenues not exceeding 60 feet in width the height shall not exceed 70 feet, and on streets and avenues exceeding 60 feet in width, the height shall not exceed 80 feet. The Chicago building ordinance adopted last month establishes the maximum height of buildings at 130 feet. The State law relating to the construction, main enance and inspection of buildings in Boston, which went into effect last year, fixed a maximum height of 125 feet for all buildings except the spires of churches, and further restricted the height to two and a half times the width of the widest street or square upon which they stand, measured from the face of the building to the street-line upon the other side.

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THE STOREY INSTITUTE, LANCASTER.

THE Free Library Committee of the Lancaster Corporation have been visiting the libraries and other places in the town with a view to secure a building in which they might temporarily lodge the public library, or otherwise fix upon a site for the erection of a building in order to carry out the purposes of the Public Libraries Acts, recently adopted by the ratepayers. As a result, it was decided to negotiate with Sir Thomas Storey for the use of the library and reading-room of the Storey Institute as part of the scheme for putting in force the Acts. Sir Thomas Storey has replied to the Corporation, and expressed his pleasure at the progress made in the way of technical and scientific instruction in connection with the Institute, pointing out that at present the whole of the educational work of the Institute was in the hands of the Town Council, including the science, technical and art classes. He had come to the conclusion that he would be best carrying out the local Act of 1886 and the wishes of the trustees of the old Mechanics' Institute, on the site of which the present Institute stands, by transferring to the Corporation the whole of the Institute, with its pictures, statuary, furniture, laboratory and apparatus, library and fittings. After a brief discussion the Town Council unanimously decided to accept the generous offer of Sir Thomas Storey, and to carry out his conditions, which they considered exceedingly simple. They were that compensation should be given to Mr. Turpin, the principal of the Institute, in case his services should be no longer required, and that Sir Thomas might have occasional use of the rooms on the basement for social purposes. A committee was appointed to arrange the details of the transference of the Institute to the Corporation. The Storey Institute, opened by the Duke of Devonshire on October 23, 1891, may now be regarded as given to the public of Lancaster. It is estimated that it cost between 20,000*l.* and 25,000*l.*

THE BIRMINGHAM BATHS.

DURING the past winter several improvements have been accomplished in some of the baths which are under the control of the Corporation of Birmingham. It may not be generally known, says the *Daily Post*, that the water used in the various departments is obtained from deep wells sunk upon the premises of each establishment. This arrangement necessitates a complete plant, large enough to raise the 100,000,000 gallons of water used every year and to heat the greater portion of

it to various degrees of temperature, varying from 76 degrees in the swimming-baths to 212 degrees in the private baths. The alterations recently carried out have principally affected the Kent Street and Northwood Street baths. At Kent Street the old corrugated iron roofing over the first-class swimming-bath has been removed, owing to its decayed and unsafe condition, and has been replaced with a new lantern roof, forming five bays, supported by the original principals. For purposes of ventilation, in place of the louvre boards two rows of clear fluted glass windows have been provided with suitable casements on each side, regulated by gear-work from the bath-room below; while two large archimedian ventilators have been added with tubes of 24 inches diameter and a height of 7 feet above the ridge. These are connected by means of wooden flues to gratings fixed in the ceiling, and each grating has an area of about 12 square feet. Means have been taken to prevent the action of the sun's rays upon the water, which has been a source of trouble by causing vegetation or other discolouration of the water. The committee have had the promenade round the bath, together with the floor of the side corridors, laid with Edwards's Ruabon adamantine quarries, bordered on each side of the promenade with coloured tiles, terra-cotta, buff and black. This pavement, which has a neat and pretty appearance, will be much more satisfactory to the bathers than the old blue-brick paving, which had become full of holes and hollows. The sanitary arrangements have also been considerably improved, and the whole department, including the entrance corridors, passages and dressing-rooms, has been thoroughly cleaned and painted. Round the walls between the dressing-room doors there are ornamental brackets, supporting pots of shrubs, and the statuary removed some time ago from the glass pavilion at Aston Hall still remains. For the greater comfort of bathers during the winter a new system of steam heating has been adopted for warming the atmosphere of the bath and dressing-rooms. There is upwards of 650 square feet of heating surface. Bathers may now obtain a comfortable winter swim free from the cold draughts and chilling atmosphere hitherto experienced. The water will be of equal temperature with the air. The alterations at Northwood Street have been of a different character. Here for some time past complaints have been made of the low temperature of the water in the swimming-baths, and the occasional want of sufficient hot water to meet the demands of bathers in the slipper baths. The committee have inaugurated a new and satisfac-

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tory system. Instead of the old hot-water and steam boilers, of which there were three of the former and two of the latter, they have put in two large steam-boilers, specially designed by their engineer for the purpose. Each is of sufficient power to do the whole work of the establishment, including the supply of necessary steam-power to the pumping-engine, the heating of water in the swimming-baths, and the provision of hot water for about seventy private baths. They will work alternate months, so that they may undergo frequent cleaning and repairs. They were made to specification by Mr. Edwin Danks, of Oldbury, and they are fitted with the most modern and approved gauges, valves and fittings, obtained from selected manufacturers. To each of the boilers are attached one 3-inch and one 4-inch bore steam service main, the former supplying the pumping-engine and the latter the various heating appliances. In place of the old hot-water boilers a specially-constructed steam-heating instrument has been connected to each of the swimming-baths, whereby the water is extracted from the deep end of the bath, conveyed to the heater, and returned into the bath at the reverse end, thus creating a steady and constant flow of tepid water through the bath, and maintaining the whole body of water at a uniform temperature of from 70 to 76 deg., as may be required. In addition to this a new steam-heater of special design has been introduced in the service pipe between the cold-water service tank at the top of the buildings and the inlet pipe of the bath; so that on all occasions when the attendant has to put fresh water into the bath (generally from 20,000 to 30,000 gallons a day) he can do so at a temperature of 74 deg., or higher if required, instead of at 48 deg., as formerly. The hot water supply to the private or slipper baths has been constructed on the same principle, with the addition of a large reserve hot-water tank, containing about 600 gallons of water, heated either by "live steam" direct or by steam circulation, according to the demand made upon the tank. To accommodate these new boilers a boiler-house, about 44 feet long by 22 feet in width, has been erected in the yard adjoining the old boiler-house. The old boilers were in the basement; the floor of the new boiler-house is on a level with the roadway and is covered with a light lantern roof. At the Monument Road establishment the committee have determined to discontinue the use of the wood foot-racks forming a portion of the floor round the promenade of the first-class swimming-bath, and to replace them with ribbed tiles. Wood soon gets rotten with the constant wet. The same change will be made in the first-class swimming-

bath at Northwood Street in due course. It is satisfactory to know that by the introduction of the new system of steam-heating at Northwood Street (rendered necessary by the unsound condition of the old boilers and the inefficient system referred to), that a considerable saving of fuel will be effected. This was found to be the case at the Kent Street establishment after a similar reconstruction in 1887. The committee are also gratified to find that in neither case have the original estimates of expenditure been exceeded. The changes have been designed and carried out by the committee's engineer, Mr. J. Cox, general superintendent.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

7306. George Josiah Body, for "Body's patent metallic double-rebated and tongued sashstile for the pulley and pivot principle."

7309. Ralph Bradley Cockcroft, Joseph Bradley and William Ward, for "Improvements in fastenings, whereby window-cords may be secured to the stiles of window-sashes."

7315. Edith Bowen Penn, for "Improvements in window-fasteners."

7326. James Marshall, for "An improved fire-alarm."

7382. Joseph Shaw, for "Improvements in ventilators for the escape of foul or heated air from rooms or buildings."

7412. Edwin George Warner, for "Warner's unbreakable tap or valve."

7425. Frank Hine Willis, for "Improvements in the construction of fireproof floors."

7427. James Rodgers Coker, James Sett and Samuel A. Rodgers, for "An improved portable fire-escape."

7459. Joseph Clulow Jackson and Joseph Ogden, for "Improvements in or connected with cage-hoist doors."

7473. Joseph Shaw, for "Improvements in ventilators."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CO., Patent Agents, 37 Chancery Lane, London, W.C.

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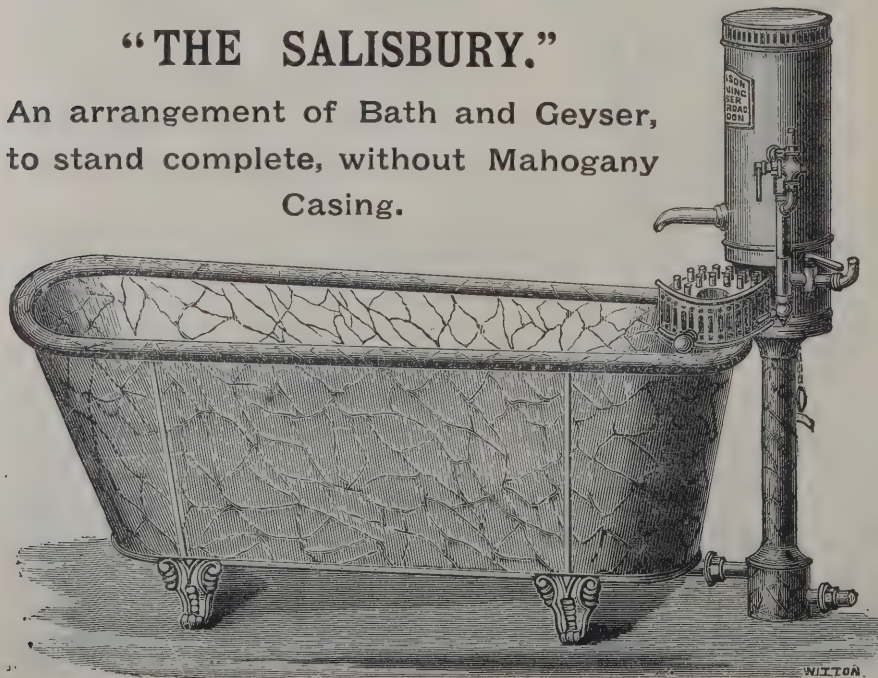
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THE Architect and Contract Reporter.

TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

LEEDS.—May 31.—Designs are invited for Public Baths. City Engineer, Municipal Buildings, Leeds.

LUDLOW.—May 30.—Prizes of 25*l.*, 15*l.* and 10*l.* are offered for Schemes for Disposal of Sewage. Mr. John H. Williams, Town Clerk, Ludlow.

WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50*l.* and 25*l.* Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10*l.* Mr. Horatio Brevitt, Town Hall, Wolverhampton.

CONTRACTS OPEN.

ACCRINGTON.—May 9.—For Excavation of Site to Basement Floor Level for proposed Technical School. Mr. Henry Ross, Architect, Birch Street, Accrington.

BARMOUTH.—May 12.—For Constructing Waterworks. Messrs. Thomas Roberts & Son, Civil Engineers, Portmadoc.

BARRY.—May 8.—For Constructing Outfall Sewers. Mr. C. R. Walker, Local Board Offices, Cadoxton, near Cardiff.

BATH.—May 11.—For Works at Winchester House. Mr. Amor, Octagon Chambers, Bath.

BELFAST.—May 11.—For Reinstatement of Premises, Berry Street. Mr. E. N. Banks, Architect, 10 Chichester Street, Belfast.

BIRDWELL.—May 12.—For Building Four Houses, &c. Mr. Walter J. Sykes, Architect, Hoyland, Barnsley.

BIRKENHEAD.—May 22.—For Building Administrative and Laundry Blocks, Isolation Pavilion and Four Ward Pavilions for proposed Infectious Diseases Hospital. Mr. Charles Brownridge, Borough Surveyor.

BOSCOMBE.—May 6.—For Building Police Station. Mr. James Robinson, County Architect, 13 Southgate Street, Winchester.

BOURNEMOUTH.—May 22.—For Construction of Above and Underground Public Conveniences. Mr. F. W. Lacey, Borough Engineer.

BRADDOCK.—May 15.—For Building Bridge over River Fowey, Nainsford. Mr. W. R. Stephens, Surveyor, Mount, Warleggan.

BRADFORD.—May 11.—For Building Workshops. Messrs. Milnes & France, Architects, Bradford.

BRADFORD.—May 10.—For Building Fourteen Houses and House and Shop. Mr. J. T. Parkinson, Architect, Bowling Old Lane, Bradford.

BRADNINCH.—May 26.—For Building Police Station. Mr. E. H. Harbottle, Architect, Exeter.

BRIGHTON.—May 16.—For Building Board School for 750 Boys, Pelham Street, and Alterations to Board School, York Place. Mr. J. W. Simpson, Architect, 10 New Inn, Strand, London, W.C.

BROMLEY.—For Building School Chapel. Mr. George E. Bolshaw, Architect, 189 Lord Street, Southport.

BROMYARD.—May 10.—For Construction of Gasworks. The Secretary, Gaslight and Power Company, Limited, Bromyard.

CAMBRIDGE.—May 8.—For Building Guildhall. Mr. W. M. Fawcett, Architect, 1 Silver Street, Cambridge.

CANNING TOWN.—May 30.—For Building Keeper's Lodge at Recreation Ground. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CARDIFF.—May 8.—For Extension of Infirmary. Messrs. Seward & Thomas, Architects, Queen's Chambers, Cardiff.

COLCHESTER.—May 8.—For Building Engine and Boiler House, Coal Store, Chimney Shaft, &c. Mr. C. E. Bland, 12 Crouch Street, Colchester.

CROYDON.—May 5.—For Building Ten Cottages. The Town Clerk.

CROYDON.—May 11.—For Additions to Polytechnic Buildings. Mr. G. Frisch, Architect. Bills of Quantities with the Town Clerk.

EAST DONYLAND.—May 17.—For Additions to National School. Plans at the National School, East Donyland, Essex.

EDGWARE.—May 6.—For Alterations to Infirmary. Mr. D. R. Soames, The Workhouse, Redhill, Edgware.

EDINBURGH.—May 9.—For Building Board School. Mr. R. Wilson, Architect, 3 Queen Street, Edinburgh.

EDMONTON.—May 10.—For Additions to Workhouse. Mr. T. E. Knightley, Architect, 106 Cannon Street, E.C.

FALLOWFIELD.—May 17.—For Building Stabling. Mr. Oliver S. Holt, Secretary, London Road Station, Manchester.

FLEETWOOD.—May 12.—For Building Cottage Hospital. Mr. R. Forrester Addie, Solicitor, Dock Street, Fleetwood.

GREAT YARMOUTH.—May 11.—For Building House. Mr. Sidney Rivett, Architect, 5 South Quay, Great Yarmouth.

GREAT YARMOUTH.—May 16.—For Building Board School for Boys. Messrs. Bottle & Olley, Architects, Regent Street, Great Yarmouth.

HALIFAX.—May 10.—For Building Four Lock-up Shops. Mr. Joseph F. Walsh, Architect, Waterhouse Chambers, Halifax.

HORNSEY.—May 8.—For Constructing Sewers, Making Roads, &c. Mr. T. de Courcy Meade, Local Board Offices, Southwood Lane, Highgate, N.

LEAVESDEN.—May 18.—For Building Isolation Block at St. Pancras Schools. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

LEEDS.—For Building Stables, &c. Messrs. Swale & Mitchell, Architects, 98 Albion Street, Leeds.

LEITH.—May 10.—For Construction of Reclamation Embankment on Foreshore, and Wet Dock Graving Dock, and Relative Works on East Side of Harbour. Sir Alex. M. Rendel, Engineer, 8 Great George Street, Westminster, or Mr. Peter Whyte, Engineer, Harbour Offices, Leith.

LITTLE BADDOW.—May 11.—For Building Cottage for Navigation Company. Mr. F. Whitmore, Architect, 21 Duke Street, Chelmsford.

LLANELLY.—May 10.—For Building Bonded and Free Stores and Offices, New Dock Road, for Messrs. Margrave Bros., Llanelly.

LOTHOUSE.—May 12.—For Part Building of Christ Church. Mr. W. Watson, Architect, Barstow Square, Wakefield.

LONDON.—May 15.—For about Fifteen Temporary Iron Buildings, School Board Offices, Victoria Embankment.

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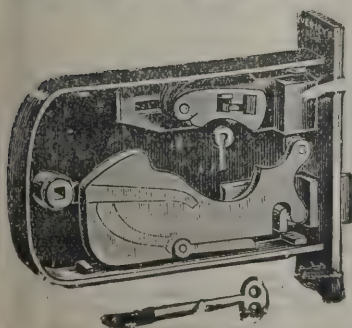
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LUDDENDEN FOOT.—May 13.—For Building Board School. Messrs. C. F. L. Horsfall & Sons, Architects, Lord Street Chambers, Halifax.

MAGHERAGALL.—May 12.—For Renovation of Church. Mr. James Hunter, B.E., Architect, Brookmount, Lisburn.

MIDDLESEX.—May 29.—For Supplying and Delivering Broken Granite to various Railway Stations, &c. Mr. F. H. Pownall, 9 Great George Street, Westminster, S.W.

MIDDLETON.—May 17.—For Purifying House with Iron Roof. Mr. T. Duxbury, Gas Manager, Middleton.

PARC GWILT.—May 31.—For Building Two Blocks for 126 Patients each, at County Asylum. Messrs. John Giles, Gough & Trollope, Architects, 28 Craven Street, Strand, W.C.

PENZANCE.—May 10.—For Building House, Hayle Towns. Mr. Oliver Caldwell, Architect, Victoria Square, Penzance.

PETERBOROUGH.—May 13.—For Building House, Park Road. Mr. James Ruddle, Architect, Boroughbury, Peterborough.

PONTYPRIDD.—May 12.—For Building Six Cottages. Mr. Thomas Rowland, Architect, Market Buildings, Pontypridd.

POOLE.—May 9.—For Building New Quay Wall, &c. Messrs. Kinipple & Jaffrey, 3 Victoria Street, S.W.

ROTHERHAM.—May 11.—For Building Theatre Royal. Mr. J. Platts, Architect, Rawmarsh Hill, Rotherham.

RUSWARP.—May 11.—For Building Villa. Mr. Edward H. Smales, Architect, 20 Skinner Street, Whitby.

SALFORD.—May 11.—For Buildings for Electric Lighting Station. The Gas Engineer, Bloom Street, Salford.

SCARBOROUGH.—May 5.—For Building Timber-framed Firing Battery, Silent Battery, Drill Shed, Latrines, &c, for use of Royal Naval Reserve. Director of Works Department, 21 Craven Street, Charing Cross, W.C.

SHEFFIELD.—May 15.—For Construction of Urinals, Hillsborough Park. Mr. C. F. Wike, City Surveyor, Bower Spring, Sheffield.

SOUTHAMPTON.—May 9.—For Renewing Slopes of Two Reservoirs. Mr. W. Matthews, Municipal Offices, Southampton.

STROOD.—May 11.—For Building Dining Halls, Kitchen, &c., at Workhouse. Mr. S. E. Bond, Architect, Rochester.

SUNDERLAND.—May 27.—For Erecting Superstructure of Asylum. Mr. G. T. Hine, Architect, 35 Parliament Street, Westminster.

TAUNTON.—May 17.—For Building Telegraph Offices and Shops at Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

THAKEHAM.—May 22.—For Additions, &c., to Workhouse. Messrs. Scott & Cawthorne, Brighton.

TORPOINT.—May 16.—For Additions to Workhouse Infirmary. Mr. Fred. W. Cleverton, 4 Buckland Terrace, Plymouth.

TREORKY.—May 13.—For Building Mission Church. Mr. Jacob Rees, Architect, Pentre, Rhondda.

TWYFORD.—May 17.—For Construction of Passenger Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

WANSTEAD.—May 5.—For Making-up Road. Mr. William Blewitt, Local Board Offices, Wanstead.

WELLINGTON.—May 10.—For Extension of Cattle Market. Mr. Isaac Knowles, Secretary, Market Hall Buildings, Wellington, Salop.

WOKING.—May 12.—For Building Post Office. Postmaster, Woking.

TENDERS.

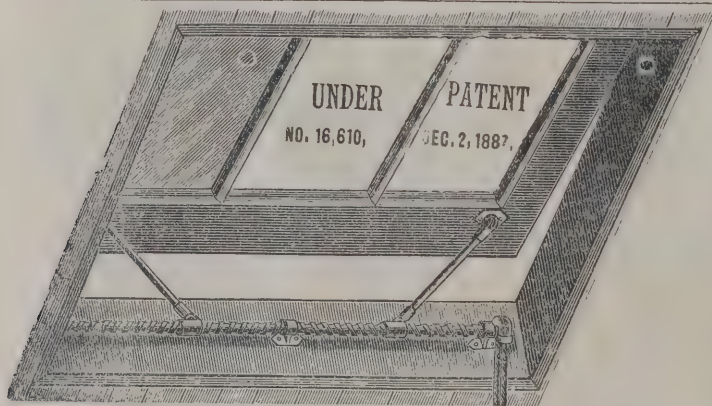
ABERDEEN.

For Building Boundary Walls, &c., Woodside Public Park Aberdeen. Mr. WILLIAM DYACK, Burgh Surveyor.
Robertson & Cormack, Aberdeen . . . £630 16 6

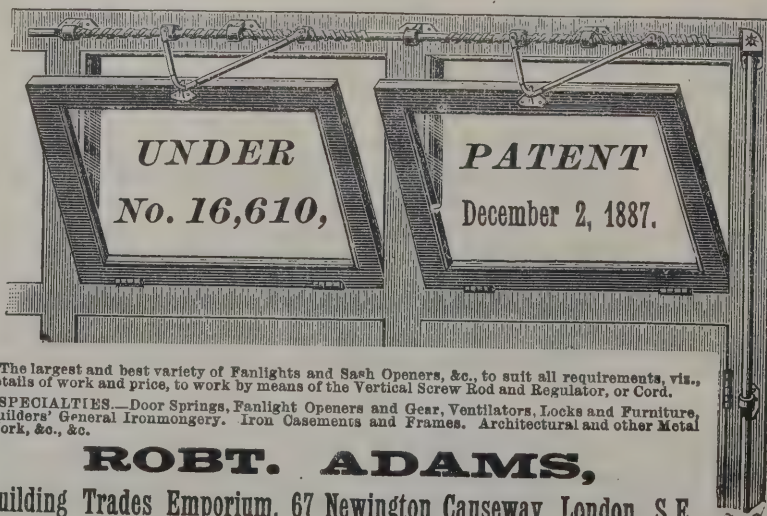
BARNSTAPLE.

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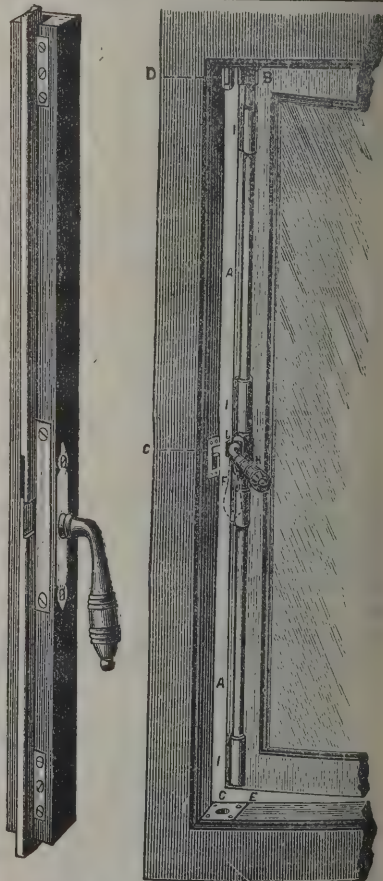
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For Additions to the Backworth Co-operative Society's Premises.			
C. F. Temple, South Shields	£670	10	5
E. & T. George, Newcastle.	650	0	0
J. & G. Douglass, Blyth	600	0	0
T. & J. White, Newcastle-on-Tyne	545	0	0
G. Carmichael, Felling	540	0	0
R. Nicholson, Forest Hall	455	10	0
J. Oliver & Sons, Killingworth	387	0	0
J. TAYLOR, Earsden (accepted)	374	17	6

CANTERBURY.

For Works for the Corporation. Mr. F. BAKER, City Surveyor, Canterbury.			
<i>Cattle Market.—Iron Fencing, &c.</i>			
D. Forbes & Co., Blackwall	£410	18	0
Cozens, Canterbury	323	7	10
DRURY & BIGGLESTON, Canterbury (accepted)	278	7	10
Johnson & Co., Dover	276	17	0

Cottage at the Sewage Farm.

Bateman & Co., Canterbury	372	0	0
Gentry, Canterbury	365	0	0
Tourney, Canterbury	360	16	9
Johnson & Co., Canterbury	362	12	10
Belsey, Canterbury	330	0	0
MOUNT, Canterbury (accepted)	320	0	0

CARDIFF.

For the Supply of Cast-iron Pipes for Reservoir, Cwmtaf, for the Waterworks Committee.			
Macfarlane, Strang & Co.	£5,249	15	0
Firmstone Bros., Stourbridge	5,186	0	0
D. Y. Stewart & Co.	4,861	15	0
J. Oakes & Co.	4,601	15	0
Staveley Iron Company.	4,560	10	0
Stanton Ironworks Company	4,463	18	6
E. B. Jackson	4,382	1	8
T. Spittle, Limited	4,246	8	0
Cochrane & Co.	4,235	10	0
C. Jordan & Sons	4,107	12	6
J. & S. ROBERTS, West Bromwich (accepted)	4,005	4	0

CROYDON.

For the Erection of Residence on the Friends' School Estate, for Mr. G. G. Knott. Mr. G. PUNNETT, Architect, Park Lane, Croydon.			
Maides & Harper	£1,095	0	0
Young & Lonsdale	1,076	0	0
Smith & Sons	1,065	0	0
E. J. Saunders	1,020	0	0
J. W. Trappitt	1,005	0	0
M. Taylor	973	0	0

ECCLES.

For Alterations and Furnishing Various Rooms, Town Hall, Eccles. Mr. A. TURLEY, Borough Surveyor.			
E. Goodall & Co., Manchester	£165	7	6
D. & H. Waddington, Bolton	150	5	0
Pearson & Brown, Pendleton	102	5	6
J. HEYWOOD, Manchester (accepted)	95	5	0
Surveyor's estimate	85	18	0

ENFIELD.

For Building Boundary Wall to Reservoir, Holt Whites Hill, for the Enfield Local Board. Mr. W. KITTERINGHAM, Surveyor.			
Parker Bros., Enfield	£725	0	0
E. W. Newman, Ponder's End	680	0	0
FAIRHEAD & SON, Enfield (accepted)	548	10	0
Surveyor's estimate	600	0	0

HEMEL HEMPSTEAD.

For Additions and Alterations to the Vicarage, Hemel Hempstead. Mr. C. L. R. TUDOR, Architect, 81 Lancaster Road, Notting Hill. Quantities by Mr. C. J. FORD, 4 Mitre Court, Fleet Street, E.C.			
F. Gladwell	£891	10	0
Sears	806	0	0
Waterman	794	0	0
Moody	723	0	0

HUCKNALL-UNDER-HUTHWAITE.

For Sewering and Forming Street, Hucknall-under-Huthwaite. Mr. WM. DODSLEY, Surveyor, Mansfield.			
J. Lane, Skegby	£388	0	0
Bower & Bostock, Hucknall-under-Huthwaite	279	5	10
M. Taylor, Hucknall-under-Huthwaite	260	0	0

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INVERNESS.

For Restoration of Lovat or Beaulieu Bridge. Mr. C. R. MAN- NERS, Engineer, Inverness.	
Henderson & Duncan, Edinburgh	£8,100 0 0
W. Macpherson, Inverness	6,524 6 0
R. Fraser, Inverness	5,830 0 0
T. Macdonald, Hilton	5,149 0 0
T. Macdonald, Porterfield	4,896 11 0
R. C. Brebner, Edinburgh (Contract No. 1 only)	1,420 0 0

LONDON.

For the Erection of the Portland Arms Public-house, Lower Clapton Road, for the Camden Brewery Company. Messrs. EDMESTON & GABRIEL, Architects. Quantities by Messrs. TASKER & SON	
Fuller	£1,750 0 0
W. A. Priors	1,685 0 0
Carmichael	1,595 0 0
Godfrey & Sons	1,583 0 0
YOUNG & LONSDALE (accepted)	1,497 0 0
For External Painting and Repairs at the Western Hospital, Seagrave Road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leaden- hall Street, E.C.	
J. & C. Bowyer	£683 0 0
W. E. Martin	627 0 0
Akers & Co.	625 0 0
A. J. Prout	479 0 0
G. Foxley	470 0 0
M. Batchelor	364 0 0
Lilly & Lilly	349 0 0
Proctor	330 0 0
W. & E. MILLS (accepted)	325 0 0
For the Erection of the Prince and Princess of Wales Public- house, Kinglake Street, Old Kent Road, for Mr. Crisp. Mr. E. B. PANSON, Architect. Quantities by Messrs. D. CAMPBELL & SON.	
Jerrard	£3,639 0 0
Grover & Son	3,616 0 0
Canning & Mullins	3,600 0 0
W. Downs	3,585 0 0
Rider & Son	3,518 0 0
Smith, Eldon Works	3,485 0 0
Smith, Camberwell	3,445 0 0
Balaam Bros.	3,360 0 0
YOUNG & LONSDALE (accepted)	3,213 0 0

LONDON—continued.

For Fitting up Hot-Water Supply and Warming Apparatus at the Diphtheria Wards in course of Erection at the Western Hospital, Seagrave Road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.	
E. Oldroyd, Leeds	£1,780 0 0
Harper Twelvetees	1,189 0 0
Clements, Jeakes & Co.	1,121 15 0
Sugg & Co.	1,075 0 0
Comyng Ching & Co.	1,072 0 0
Jenkins & Sons, Leamington	956 0 0
J. F. Clark	934 10 0
May Bros.	915 0 0
H. Conolly	880 0 0
J. C. & J. S. Ellis, Sheffield	824 17 0
MURDOCK & CAMERON (accepted)	787 0 0
For Building Administrative Block at North-Western Hospital, for the Metropolitan Asylums Board. Messrs. PEN- NINGTON & BRIDGEN, Architects.	
Scrivener & Co., Regent's Park	£44,759 0 0
Willcock & Co., Wolverhampton	42,649 19 0
Perry & Co., Bow	41,800 0 0
Treasure & Son, Harringay	40,865 0 0
J. Allen & Sons, Kilburn	39,060 0 0
W. Shurmur, Upper Clapton	38,970 0 0
J. & C. Bowyer, Upper Norwood	38,880 0 0
H. Wall & Co., Kentish Town	37,610 0 0
Kirk & Randall, Woolwich	37,042 0 0
C. WALL, Chelsea (accepted)	36,500 0 0
Godson & Sons, Kilburn (withdrawn)	35,575 0 0
For the Erection of a Detached House and Stabling in Church Road, Wanstead, N.E. Mr. HERBERT RICHES, Archi- tect, 3 Crooked Lane, King William Street, London, E.C.	
E. Cains	£1,550 0 0
J. Jolliffe	1,545 0 0
J. Catley	1,525 0 0
Osborn & Sons	1,525 0 0
F. L. WILLMOTT (accepted)	1,478 0 0
For Painting and other Repairs at St. Bartholomew's Hospital, E.C., for the Governors.	
Young & Lonsdale	£792 0 0
Pitcher	789 0 0
Charteris	759 0 0
Pitman & Son	734 0 0

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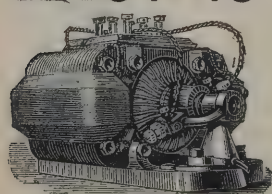
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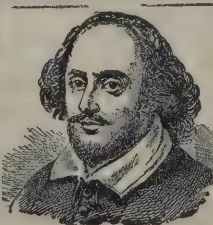
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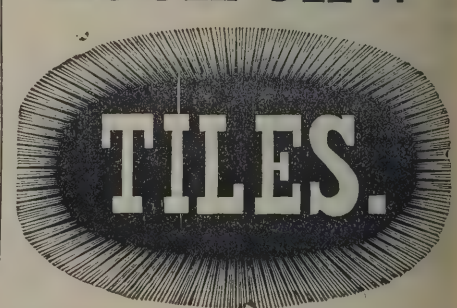
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LONDON—continued.

For Additions to Norman House, Fulham. Mr. C. L. R. TUDOR, Architect, 81 Lancaster Road, Notting Hill. Quantities by Mr. C. J. FORD, 4 Mitre Court, Fleet Street, E.C.

Higgs & Hill	£1,184	0	0
Woodward	1,107	0	0
Hollingsworth	1,020	0	0
Toger	958	18	0
Nash	900	0	0
Knight	890	0	0

For New Shop Front and Repairs to Fairland House, Romford Road, Stratford, E., for Mr. A. McCandlish. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

J. & H. Cocks	£179	0	0
Coulsell Bros.	167	0	0
F. Voller	166	0	0
Hearle & Farrow	150	0	0
J. & F. BANE (accepted)	133	0	0

For Construction of Road and Sewers, Chiswick. Messrs. F. & W. STOCKER, Surveyors, 90 and 91 Queen Street, Cheapside.

T. Adams, Wood Green	£740	0	0
Hoare & Sons, 74 Blackfriars Road, S.E.	730	0	0
J. Mears, South Kensington	675	0	0
Nowell & Robson, Kensington	670	0	0
M. M. Rhodes, Chiswick	620	0	0
T. Rook, Hammersmith	586	9	6
W. Parker, Brentford	505	0	0
Wimpey & Co., Hammersmith	462	0	0
Neave & Son, Paddington	445	0	0
KILLINGBACK & CO., Camden Town (accepted)	429	0	0

For Painting, Distempering and Other Work at Union Infirmary, St. Dunstan's Road, Hammersmith.

Serff Bros. & Co., Chiswick	£798	0	0
A. Wells, Kensington	648	0	0
A. W. Derby, Bromley	578	0	0
E. Proctor, Woolwich	500	0	0
W. Brown, Shepherd's Bush	440	0	0
Lilly & Lilly, Limited, London	329	0	0
Mills Bros., Westcombe Park	325	0	0
T. Bendon, Hammersmith	275	0	0
BARBER & REED, Putney (accepted)	255	0	0

LONDON—continued.

For Works to Rylston and Sherbrooke Roads, Fulham. Mr. J. P. NORRINGTON, Surveyor.

Nowell & Robson, Kensington	£1,586	0	0
G. Wimpey & Co., Hammersmith	1,389	0	0
J. Biggs, Birmingham	1,350	0	0
E. Parry, Fulham	1,330	0	0

For Works to Fulham Road. Mr. J. P. NORRINGTON, Surveyor.

Nowell & Robson	£7,207	0	0
J. Biggs	6,300	0	0
G. Wimpey & Co.	6,185	0	0
E. Parry	5,850	0	0

For Works to King's Road, Fulham. Mr. J. P. NORRINGTON, Surveyor.

Nowell & Robson	£296	0	0
G. WIMPEY & CO. (accepted)	246	0	0

For Making-up and Paving Margrave Crescent, Fulham. Mr. W. SYKES, Surveyor.

Margrave Crescent—Roadway.

Greenham	£275	0	0
Nowell & Robson	270	0	0
Parry	265	0	0
Wimpey	233	0	0
Rogers & Co.	233	0	0

Adamant.

Wimpey	37	0	0
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Imperial.

Imperial Stone Company	38	0	0
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Road-making and Tar-paving.

Greenham	475	0	0
Nowell & Robson	473	0	0
Rogers & Co.	435	0	0
Wimpey	412	0	0

York.

Rogers & Co.	120	0	0
Nowell & Robson	111	0	0
Wimpey	109	0	0

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Wimpey	77	0	0
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Imperial Stone Company	79	0	0
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LONDON—continued.

For External Painting, Repairs and other Work at Western Hospital, for the Metropolitan Asylums Board.

J. & C. Bowyer, Upper Norwood	£683	0	0
W. E. Martin, West Kensington	627	0	0
W. Akers & Co., South Norwood	625	0	0
A. J. Prout, New Southgate	479	0	0
G. Fowley, King Street, Regent Street	470	0	0
M. Batchelor, Maidstone	364	0	0
Lilly & Lilly, Limited, Whitcomb Street, W.C.	349	0	0
E. Proctor, Woolwich	330	0	0
E. MILLS, Westcombe Park (accepted)	325	0	0
C. J. Shaw, Lavender Hill (withdrawn)	215	0	0

For Building Shop and Dwelling-house, 720 Old Kent Road, for Mr. E. W. Ellis. Messrs. WARING & NICHOLSON, Architects, 55 Parliament Street, Westminster.

H. Joyce	£864	0	0
C. King	710	0	0
T. Laphorne & Co.	689	0	0
W. L. SIMPSON (accepted)	570	0	0

For Additional Chamber at the Public Mortuary of the Parish, for the Vestry of St. George-in-the-East.

Linfield	£557	0	0
Limn & Son	495	0	0
Browning & Carhart	465	0	0
Burton & Teesdale	445	0	0
Calnan	393	0	0
Needman	384	0	0
J. SPARKS (accepted)	335	0	0

PONTYPRIDD.

For Building Shops, Market Square, Pontypridd. Mr. ARTHUR O. EVANS, Architect, Town Hall, Pontypridd. Quantities by Architect.

A. Richards, Pontypridd	£2,700	12	0
Williams & James, Pontypridd	2,490	0	0
Watkin Williams, Pontypridd	2,450	0	0
D. C. Jones & Co., Gloucester	2,263	0	0
D. Jones, Treforest	2,261	6	11
M. Julian, Pontypridd	2,244	0	0

PLAISTOW.

For the Drainage of the Cemetery for the Burial Board of St. Mary's, Plaistow, Bromley, Kent, from Drawings and Specification prepared by Messrs. WADMORE, WADMORE & MALLET, 35 Great St. Helen's, E.C. Consulting Engineer, Mr. R. F. GRANTHAM, C.E., Northumberland Avenue Chambers, W.C. Quantities by Messrs. STANGER & SON, 21 Finsbury Pavement, E.C.

Mowlem & Co., London	£1,223	0	0
Iles, Wimbledon	1,169	0	0
Rigby, Croydon	1,094	19	0
Rogers & Co., London	890	0	0
Mays & Co., London	765	0	0
Cooke & Co., Balham	745	0	0
Lansbury, Bromley	661	10	0
Neve & Son, London	612	0	0
Jackson, Plaistow, E.	600	0	0

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WM. BARRETT, Sherborne (accepted) . . . £1,160 0 0

For Additional Bedrooms at the Yeatman Hospital at Sherborne, for the Trustees. Mr. THOMAS FARRALL, Architect, Sherborne.

L. A. Penny, Sherborne . . . £185 16 6

For Rebuilding Two Cottages, Long Street, Sherborne, for Mr. H. Cox. Mr. THOMAS FARRALL, M.S.A., Architect, Sherborne.

Penny & Hebditch, Sherborne . . . £198 0 0

For Building new Shop-front, Cheap Street, Sherborne, for Mr. A. W. Dodge. Mr. THOMAS FARRALL, Architect, Sherborne.

W. Croft, Sherborne . . . £61 0 0

SOUTH SHIELDS.

For Erection of Two Houses and Shops in Westoe Road, South Shields, for Mr. Henry Chapman. Mr. HENRY GRIEVES, A.R.I.B.A., Architect, Albany Chambers, South Shields.

A. Ross, South Shields (accepted) . . . £1,080 0 0

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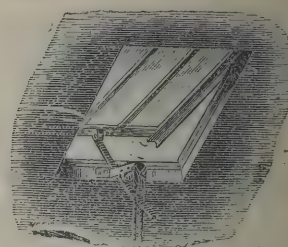
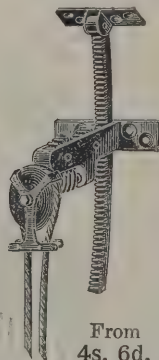
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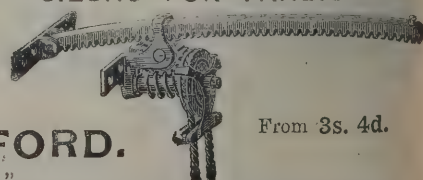
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For Alterations to Property situate in Fowler Street, South Shields, for Mr. C. F. Shotton. Mr. HENRY GRIEVES, A.R.I.B.A., Architect, Albany Chambers, South Shields.
R. Goodman, South Shields . . . £315 0 0
W. J. ROBERTSON, South Shields (accepted) . . . 285 0 0
W. Scott . . . 277 11 0

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For Restoring the Tower of the Church of St. Werburgh, Kingsley, Stoke-on-Trent. Mr. ABRAHAM MOSLEY, Architect and Surveyor; Goodyear Chambers, Abington Square, Northampton.

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G. GOLDSTRAW, Ipstones, Stoke-on-Trent (accepted) . . . 205 11 6

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G. Goldstraw . . . 185 5 6

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For Alterations and Additions to the Grove Tavern, Public-house, Grove Road, Walthamstow, E., for Messrs. Savill Bros. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.
W. Watson . . . £1,600 0 0
W. Shurmur . . . 1,557 0 0
F. Voller . . . 1,460 0 0
A. Reed & Son . . . 1,300 0 0
J. & H. Cocks . . . 1,275 0 0
HEARLE & FARROW (accepted) . . . 1,275 0 0

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For Repairs and Alterations to Church of St. Margaret's, Wetton, Staffs. Mr. LARNER SUGDEN, F.R.I.B.A., Architect, Leek. Quantities supplied.
J. W. BASSETT, Hulme End (accepted) . . . £564 5 0

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J. Dickson, St. Albans . . . 1,496 0 0
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C. W. Killingback . . . 1,375 0 0
J. Jackson . . . 1,300 0 0
H. Hill . . . 1,298 0 0
F. Dupont . . . 1,188 0 0
G. BELL, Tottenham (accepted) . . . 1,140 0 0
Engineer's estimate . . . 1,146 0 0

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Thomas Green, Wincanton . . . £285 0 0

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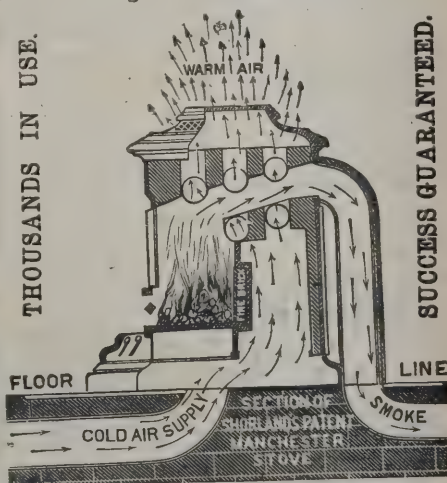
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For Sewage-Disposal Works at Oatlands and Weybridge, for the Chertsey Rural Sanitary Authority.

Adams	£43,000	0	0
Coker	35,869	0	0
Jenkins	35,000	0	0
O. Seaton	34,871	0	0
Bell	33,669	0	0
Hipwell	30,872	0	0
Cooke	29,990	0	0
Dickson	29,139	0	0
Neave	27,840	0	0
Band	27,450	0	0
J. JACKSON, Plaistow (accepted)	26,500	0	0
<i>Engines and Machinery for Sewage Works.</i>			
MANLOVE, ALLIOTT & CO. (accepted)	1,514	0	0
<i>Engines and Machinery for Pumping Station.</i>			
DAVEY, PAXMAN & CO. (accepted)	2,900	0	0
<i>Pipes, Castings, &c.</i>			
STANTON IRONWORKS CO. (accepted)	6,710	12	0

TRADE NOTES.

MESSRS. LAING, WHARTON, & DOWN, of 82A New Bond Street, W., have just received the contracts for electrical installations, or other electrical work, at the following places:—Messrs. Collier Bros., Essex Brewery, Walthamstow; Messrs. Hohler & Co., 26 Birch Lane; additions for Mr. Tom Brown, 48 Conduit Street; premises of Messrs. Redfern, 26 and 27 Conduit Street, requiring some 500 lights.

THE Leeds Mercury says that the steelworks in Staffordshire have announced that so large is the present demand for steel of all descriptions that they could double existing contracts if prices permitted to compete with Scottish and Cleveland makers. Bridge plates have been dropped to 5*l.* 15*s.* and 6*l.*; large bars 5*l.* 10*s.* and channels 6*l.* Brooms are 4*l.* 5*s.* and boiler-plates 6*l.* 10*s.* Cleveland steelmakers are sending Bessemer plating bars into the Midlands at 5*l.* 10*s.* to 6*l.*, and are taking many orders.

THE Chertsey Rural Sanitary Authority, at their meeting on April 25, accepted the following tenders for the sewerage

and sewage-disposal works for Weybridge and Oatlands:—Mr. John Jackson, The Laurels, Broadway, Plaistow, London, E., for the general contract for the construction of sewers, pumping-station and precipitation tanks (26,500*l.*); the Stanton Ironworks Co., Limited, near Nottingham, for the supply of iron pipes, special castings, and other ironwork in connection with the above works (6,710*l.* 11*s.* 8*d.*); Messrs. Davey, Paxman & Co., Colchester, for the boilers and pumping engines (2,900*l.*); Messrs. Manlove, Alliott & Co., Limited, Nottingham, for the mixing and pressing machinery at the disposal works (1,514*l.* 2*s.*)—the total amount of the contracts being 37,624*l.* 13*s.* 8*d.* Mr. W. H. Radford, C.E., of Nottingham, is the engineer to the works.

A STRIKE of bricklayers and labourers has begun at Brighton and Northampton. At Stockport a strike of operative masons has taken place.

An illustrated catalogue of sanitary specialities, including cottages, w.c.'s, latrines for schools, workshops, &c., gullies, traps, &c., has just been issued by Messrs. J. Duckett & Son, Limited, of Burnley, Lancashire. The merits of the automatic slop water-closets can hardly be exaggerated, and since their introduction the demand has steadily increased for them, also the excellent Duckett's self-cleaning channel gulleys. One elaborate feature of the catalogue is that the illustrations given are so precise in their details as to become equivalent to expensive working drawings. We can strongly recommend this catalogue to the inspection of all interested in sanitary appliances.

WE have lately inspected the steam turnery works of Messrs. H. J. Budd & Co., 96 Holloway Road, N. Every description of turnery—balusters, newels, handrails, &c.—are manufactured by the firm in the best possible manner and with despatch. We can confidently recommend buyers of this class of goods to communicate with Messrs. H. J. Budd & Co., for designs and prices.

WE notice that Mr. Joseph Taylor, lately a member of the firm of Messrs. Taylor & Tucker, Limited, has commenced business on his own account at 42 Lamb's Conduit Street, W.C., as manufacturer of art metal-work, gas and electric light fittings, &c. Mr. Taylor is so favourably known as making a speciality of high-class work, that we have no doubt that orders entrusted to him will give satisfaction. Mr. Taylor is patentee and manufacturer of a patent combination table pillar, which can be used as a bracket or for lighting pictures,



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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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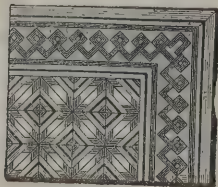
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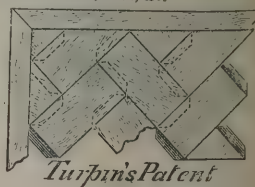
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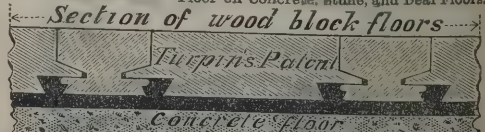
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Turpin's Patent

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Section of wood block floors

Turpin's Patent

Concrete floor

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and can be fixed at any angle by simply moving the quadrant. A pretty Pompeian electric pillar of elaborate design is also worthy of attention. Very commodious workshops at 42 Lamb's Conduit Street, W.C., give every facility for doing work on the spot, with prompt attention to orders. Architects' designs will be carefully followed.

VARIETIES.

THE death is announced of Mr. E. W. Brooking, formerly surveyor to the Barnet Local Board and Rural Sanitary Authority, and afterwards to the Finchley Local Board. Mr. Brooking was a man of great ability as a surveyor and engineer, and will be remembered with esteem by a large circle at Barnet and Finchley.

AT the meeting of the Irwell and Mersey Joint Committee the inspector, Mr. Tatton, presented a report in which he said:—I have inspected the Ship Canal with a view of verifying the complaints which have been made as to the condition of the water. I can fully endorse what was said at your last meeting. The water at the present time is very foul, and the stench from it is abominable. When the canal is filled and the rate of flow is consequently reduced the condition of things will be very bad, and local authorities with schemes of sewage disposal in hand should use their utmost endeavours to get their works in operation by the summer of 1894. By that time the bulk of the Manchester sewage will be treated, and the Salford effluent will, we hope, be improved; but there will still be considerable pollution from towns higher up the rivers whose schemes are only now before the Local Government Board.

THE Drapers' Company have made another grant of 1,000*l.* for 100 scholarships, tenable for three years, at the People's Palace Day Technical School.

THE Paris correspondent of the *Standard* says:—A line of electric tramcars, likely to prove useful to visitors to the French capital, has been inaugurated. The head of the line is just behind the Opera House, whence it proceeds down the Rues Lafayette, Maubeuge, and De la Chapelle to St. Denis.

THE annual meeting of the London and Lancashire Fire Insurance Company has just been held. The report submitted states:—"The directors propose to pay a dividend of 7*s.* per share, free of income tax, making, with the interim dividend of 3*s.* per share already paid, a total distribution of 10*s.* per

share, the same as for the last two years." The director remark that their policy of restricting dividends, which has occasionally been commented on as partaking somewhat of the nature of parsimony, is amply justified by the experience of the past year, as it is owing to the fact of the company's reserves having been increased during the previous three years by no less than 312,741*l.* that they feel themselves justified in recommending payment of the usual dividend.

THE Bromielaw Bridge, Glasgow, designed by Telford, is to be carefully removed and re-erected over the Clyde at Govan Street, with an approach from The Green. The work will cost about 50,000*l.* A wider bridge is about to be substituted for it.

AT Glasgow the Lord Dean of Guild Guthrie Smith has issued an interlocutor in respect of a claim made by the Glasgow Master of Works on the proprietors of Windsor Terrace, in Great Western Road, seeking them to repair the footpath opposite their respective properties. His Lordship dismissed the claim and awarded the proprietors their expenses. He held that what was asked by the Master of Works was most unreasonable and most unnecessary.

A NEW drainage scheme and improved water-supply has been recommended for Stamford by Mr. G. E. Lawford, engineer, Westminster. The cost of the entire drainage scheme is estimated at 54,000*l.*, which includes a 10 per cent. margin for contingencies.

BUILDING AND BUILDERS.

THE *Leeds Mercury* says:—The Corporation Building Clauses Committee have passed eighty-two plans, including several for the opening out of large estates.

THE same paper notices that a Leeds firm has taken out a patent for an improved method of making foundations for roads and buildings. It consists of iron frames with a corrugated centre, the frames being filled with concrete and pinned together, making one continuous foundation.

PLANS have been prepared by Messrs. Beaumont, architects, for the extension of the Manchester Reference Library, the cost of the proposed building being estimated at about 12,800*l.*

A NEW church is to be erected at Bessingly, near Hull, at an outlay of about 3,000*l.*, the cost being met by a bequest made by the late Mr. George Wright, of Bessingly Hall.

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ALBERT WORKS, ALBERT EMBANKMENT, LONDON, S.E.

It is stated that Lord Battersea will preside at the twenty-fifth annual meeting of the South London Art Gallery, to be held in the Gallery, Peckham Road, on Tuesday next. He will be supported by Mrs. Burne-Jones, Mrs. Watts and other friends of the Gallery.

THE *City Press* says it has been referred to Mr. G. F. Watts, R.A., as a life-long friend of the late Laureate, to decide the competition for the bust of the late Lord Tennyson to be placed in Guildhall.

A VISIT TO THE POTTERIES.

A PARTY of the Incorporated Association of Municipal and County Engineers, on Saturday, the 29th ult., visited the Staffordshire works of Messrs. Doulton & Co., at Rowley Regis, near Dudley, which are devoted to the manufacture of stoneware pipes, chimney-pots, blue bricks and architectural terra-cotta. These works are the largest of the kind in the kingdom, and, together with the clay workings, cover an area of some 30 acres, and give employment to about 700 men. A canal runs through the works, and this, together with the adjacent railway sidings, affords every facility for the transport of goods. The members of the Association were conducted through the various buildings, and were shown the numerous processes the clay undergoes from the time it is taken from the clay-fields until it issues as the finished product. There are eight large steam-presses at work capable of turning out about ten miles of sanitary pipes per week. Extensive drying-rooms, heated by steam, are used to prepare the pipes for the kilns. The blue brick works are laid out on the most approved principles, and have an output of 100,000 bricks per week. A branch of the works is devoted to the manufacture of the highest class of architectural terra-cotta, and the work in hand shows a very high standard of finish. Special attention is given to the subject of colour, some particularly fine red and plum-coloured blocks being visible.

In connection with these works there are also engineering shops replete with all machines and tools necessary for the production of dies, &c., required for Messrs. Doulton's numerous works throughout the country, and the visitors, in being taken through the pattern-shops, smithy and fitting-shops were shown many machines, &c., in course of preparation.

The steam-power for the works is derived from five large boilers, and the engines are capable of supplying 1,000 horse-power.

ILLUSTRATIONS.

HOUSE AT BROXBORNE,

RESIDENCE AT MOSELEY, NEAR BIRMINGHAM.

THE NEW INN, GLOUCESTER.

ART METAL-WORK.

MESSRS. TOWNSHEND & Co., Birmingham and London, whose productions in art metal-work have secured a reputation for their excellence, combined with the extreme of moderation as to

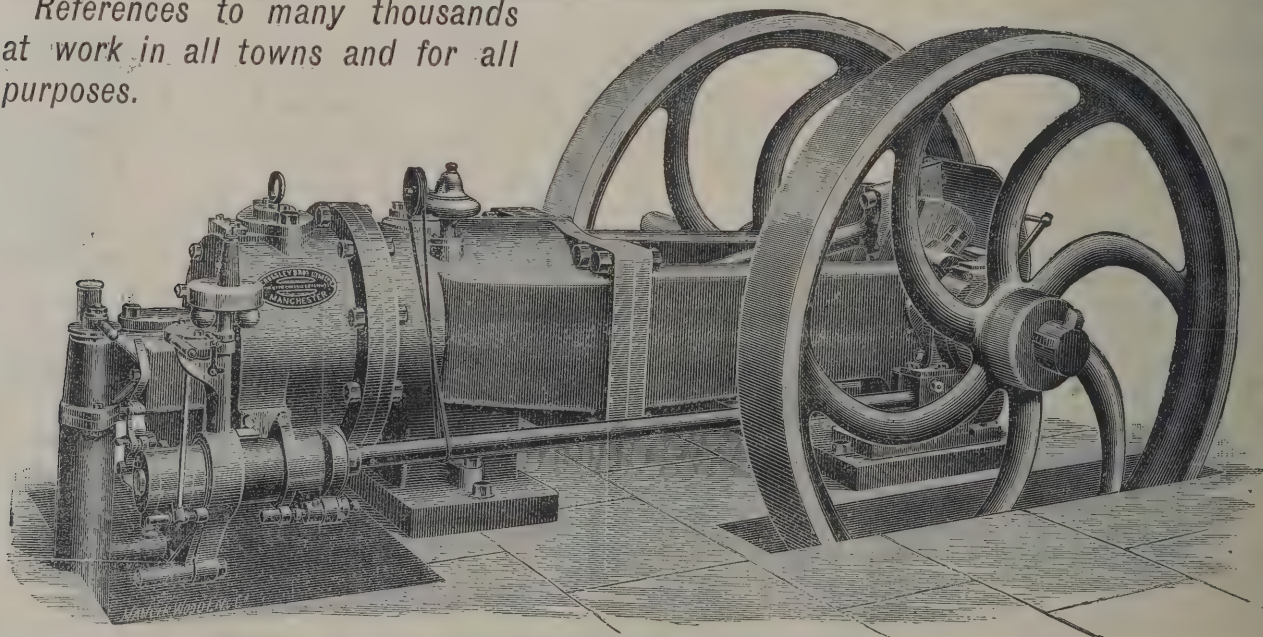


FIG. 1.

price, have lately brought out some 160 new designs to meet the requirements of the spring and summer trade. A visit to

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References to many thousands
at work in all towns and for all
purposes.



Represents 30 h.p. nominal, indicating 85 h.p.

CRYSTAL PALACE EXHIBITION, DIPLOMA OF HONOUR, HIGHEST AWARD TO GAS ENGINES.
 Patent Starters. Patent Tubes for Ignition. Patent Pendulum Governors. Patent Safety Starting Handles.
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 Every Engine thoroughly tested before being sent out. All parts made strictly to Gauge. Over 800 Engines always in hand.
 Crossley's Patent Oil Engines. Crossley's High Speed Engines for Electric Lighting.

CROSSLEY BROS., LIM., OPENSHAW, MANCHESTER.

The Largest Manufacturers of Gas Engines in the World.

the showrooms in Birmingham or in London (No. 62 Holborn Viaduct) will enable our readers to judge for themselves of the meritorious character of these articles. Or, indeed, a fair judgment may be passed on them by consulting the supplementary illustrated trade-lists just prepared by Messrs. Townshend & Co. Great credit is due to the enterprise of Messrs. Townshend & Co. for placing in the market domestic objects of everyday use in so charming a variety of designs at what have been rightly termed phenomenally low prices. In other words, it was only necessary that some one should show



FIG. 2.

it was possible to produce articles of everyday use as cheaply in a form of beauty as has been the case with all useful, but in the main unsightly, requisites. Articles of domestic use are so numerous and varied that it would involve compiling a small dictionary to run through the whole gamut. These may therefore be left without more direct mention. We append some engravings of objects which it will be found are in general

use where ornamental effect is aimed at, which nowadays is the rule rather than the exception.

Fig. 1 is a sample out of several good designs of the "Chic" brush sets for halls of houses, mansions, &c. These useful articles provide for brushes and mirrors, receptacles for matches, and can be furnished also with a dinner-bell. The engraving shows one appliance on an oak shield with brush holders &c., in brass-work. In referring to the hall a mention of fern pots and jardinières is apropos where they exercise with the ferns and flowers they contain so delightful an effect. The jardinière (fig. 2) is one design out of many pleasing ones, and



FIG. 3.



FIG. 4.

shows how well the polished brass "Arundo" metal lends itself to art-work. The stand fitted with vases in decorated china is all that can be desired. The variety of stands, large and small, and china vases, are well worth inspection, including varieties that find an appropriate place on the table.

Fig. 3 shows a handsome 6-inch Japanese bronzed and engraved gong in "Arundo" art brass-work on an oak board, and fig. 4 a 5-inch hammered gong, the illustration of which speaks for itself. These are only samples out of many prettily designed similar objects. Other articles include tasteful

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by Messrs. Townshend & Co., and fig. 6 is an example out of a series of graceful designs, and is made of polished brass and

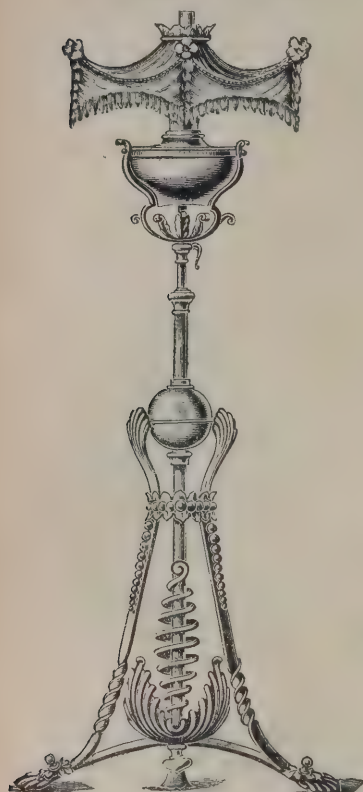


FIG. 5.

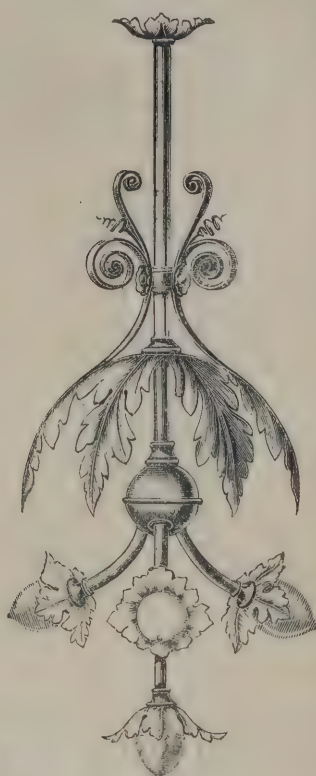


FIG. 6.

tinue, there are a variety of telescopic floor lamps of excellent design. Fig. 5 shows a handsome one of wrought-iron, enamelled white and gold-coloured brass.

Electric light fittings have also had attention paid to them



FIG. 7.



FIG. 8.

copper. Fig. 7 is designed for an electric table-lamp, and is of polished brass "Arundo" art metal, while fig. 8 shows a bracket-light mounted on an oak back.

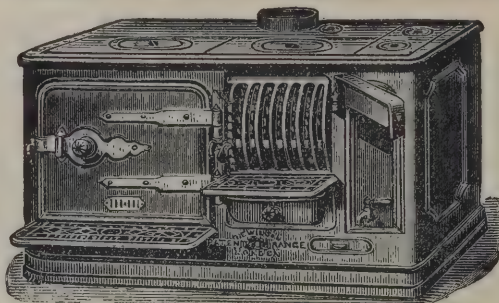
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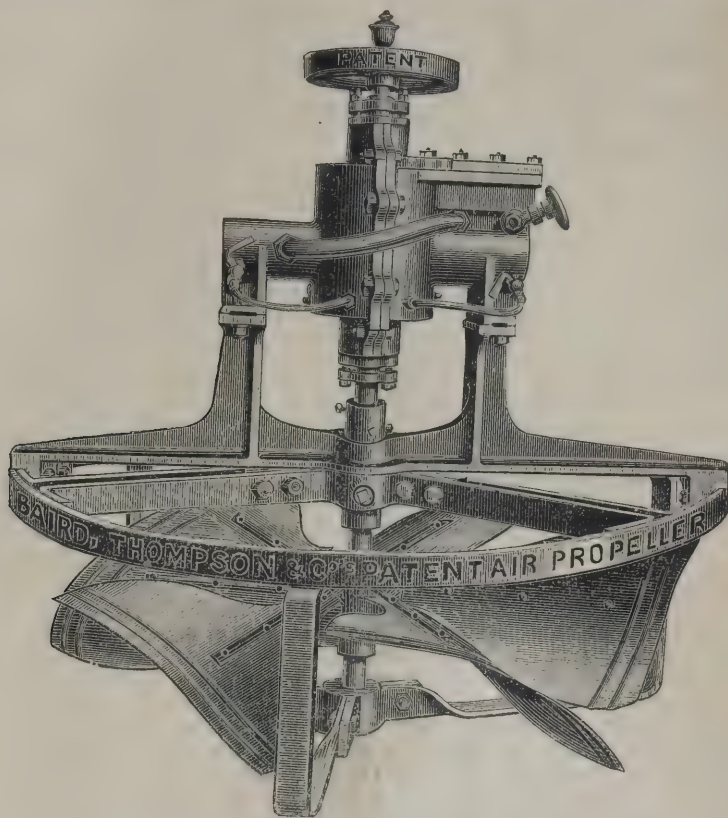
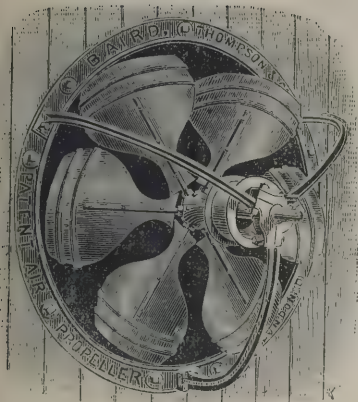
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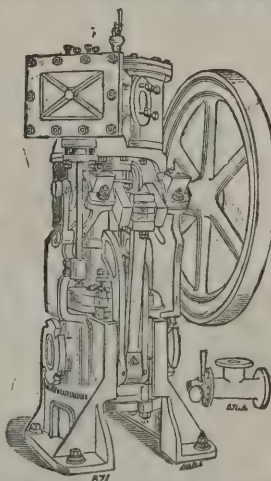
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and change of direction, whereas if a pressure-blower is used it does not deliver a sufficient volume of air to make it suitable for ventilation, and in addition is an extravagant method of utilising energy, the expenditure of power for the results obtained being excessive. The Baird-Thompson propeller is a combination of the two principles designed so as to deliver a greater volume of air than any other propeller. The pressure can be regulated so as to overcome the resistance in any length or form of duct, and that within moderate limits of speed consistent with economical working. That the "Baird-Thompson system of ventilation" and air-propeller is being very generally adopted must be taken as evidence of efficiency at a minimum of cost, it not being necessary to have either such large propellers and ducts or such powerful motors. For driving these propellers any power may be employed, but usually they are belt-driven, either from gas or steam-engine. Special attention may be called to the electric "Baird-Thompson" air-propeller, which is especially suitable either where the electric current is laid on or where electricity is already generated for other purposes, notably where it is necessary to run a fan at a considerable distance from the central source of power, as it is much easier to convey power by electric current in a couple of wires than by steam-pipes or gearing. Another form is the "Baird-Thompson" propeller, a patent high speed engine, combined with which all that is required for driving is a half-inch steam-pipe connected with boiler. The patentees and manufacturers of these propellers are Messrs. Baird, Thompson & Co., 159 Queen Victoria Street, London, and 20-26 Bath Street, Glasgow, from whom all information may be obtained.

SOCIETY OF ENGINEERS.

At the meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening, the 1st inst., Mr. W. A. McIntosh Valon, J.P., president, in the chair, a paper by Mr. Edmund Burrows on Blake's Bridge, Reading, was read. This bridge crosses the river Kennet, and unites the north and south sides of the borough. The old bridge was erected in 1855, with a carriage road only 14 feet wide. Proving too narrow for the increase of traffic, it has been removed, and a new bridge, 30 feet wide, has been erected by the Corporation in its place. The new bridge of 51 feet 4 inches span was designed by Mr. A. T. Walmisley, and consists of lattice girders 4 feet 6 inches deep, having parallel flanges with ornamental

cast-iron work between the diagonal members, so fixed as to provide a parapet without interfering with the definite transmission of strain throughout the braced members of the structure, which is constructed of mild steel. With the view of distributing the live load produced by a steam-roller of 15 tons, together with a distributed weight over the remainder of the platform estimated at 1 cwt. per foot super, trough flooring 5 inches deep is used, having the lines of ridge and furrow fixed at right angles to transverse lattice girders 4 feet 6 inches apart, suspended from the main girders, but stiffened in their attachments at the ends by side brackets. The girder form of construction was adopted as providing uniform headway under the bridge, while the original level of the approaches and roadway over the bridge was not raised. With the view of employing the abutment walls of the old bridge, the new girders were carried on brick piers supported by pile foundations, and surmounted with ornamental masonry caps. The upper flange of each of the main girders is covered with American oak to form a hand-rail. The bridge was tested after completion by loading with water-vans, a 10-ton steam-roller and loaded stone trolleys, in all amounting to a total load of 63½ tons distributed, and gave a deflection in the centre of three-sixteenths of an inch. The bridge was opened for public traffic on October 6, 1892. During construction vehicular traffic was only impeded for about two and a half months. Messrs. Parker & Co. were the contractors for the foundations and masonry, and Messrs. Handyside & Co., of Derby, for the erection of the steel and iron work. The total cost of the bridge and improved approaches was 4,500*l*. The author acted as resident engineer for the Reading Corporation during construction.

CAST-IRON FOR CONSTRUCTIVE PURPOSES.*

THE literature relating to cast-iron is more scanty than that relating to any other of our leading constructional materials, probably because in recent years it has had to give place very much to wrought-iron and steel, and so being of less importance than them, investigations regarding it have not kept pace with those concerning the other forms of iron. Notwithstanding its defects, it still presents certain advantages over other materials,

* A paper read by Mr. F. A. Campbell, C.E., before the Victorian Institute of Architects and published in the *Australasian Builders and Contractors' News*.



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which always entitle it to retain a place as a useful, and for some purposes, indispensable material for the architect and engineer, and so while this is the case it is important that our knowledge of it should be as complete as possible. I venture, therefore, to place before you briefly some notes as to the characteristics of this metal, not that I have to lay before you anything new or startling in connection therewith, but by directing your attention to the subject I may be perhaps the means of arousing an interest regarding it in the minds of some members of this Institute, as well as a spirit of inquiry and investigation upon those points which are still obscure.

Cast-iron is a crystalline compound of iron, carbon, silicon, sulphur, manganese, phosphorus, as well as a few other elements in smaller proportions. It is manufactured, as you are aware, from ores which are very widely distributed over the earth's surface, chiefly occurring as oxides or carbonate of iron. These being highly heated in a furnace with fuel and flux are reduced to a molten state, which fluid metal is run from the furnace into channels prepared in a sandy bed, the result being pig-iron, which is the first and crudest description of cast-iron. Pig-iron may roughly be divided into two main classes—white and grey—the first being hard and brittle, the second softer and tougher. The class to which all iron belongs depends not only upon the processes involved in its manufacture, but also upon the amount and kind of elements in combination with it. Carbon is the most important of these, and determines to a great extent not only the various qualities of cast-iron, but also whether the combination is cast-iron, wrought-iron or steel. The proportion of carbon in these is—Cast-iron, 2 to 6 per cent.; steel, 1.5 to 1.8 per cent.; wrought-iron, trace to .25 per cent. It is evident then that the greater the proportion of carbon the greater becomes the hardness and brittleness of the metal, the white cast-iron being the most highly carbonised of the whole series. The manner, however, in which the carbon occurs in the metal influences it as well. In all cast-iron it occurs in two forms, chemically combined and mechanically mixed; when chemically combined the white iron is the result, when mixed in the form of graphite the grey iron, and the softer grey may be turned into the brittle white by heating and suddenly cooling it, which process apparently prevents the carbon in the molten metal from separating in the form of graphite, and so it becomes combined with it. Of the other elements found in combination with iron, I will only mention phosphorus, which renders the iron weaker, but more fluid and suitable for small and delicate castings; and

manganese, which forms a metal much used in steel manufacture.

Cast-iron in forms ready for constructional purposes is prepared from the pig-iron by a further process of smelting which renders it more homogeneous, assists to free it from impurities and is necessary in order that it may be run into the moulds to give it the form required. The founder prepares the metal according to the work it has to perform, choosing and blending various qualities of pig according to the dictates of experience. The grey pigs are those chiefly used in the foundry, the white being more useful for the manufacture of wrought-iron. Toughened cast-iron is made by adding a certain proportion of scrap to the mixture in the furnace. Malleable cast-iron is made by absorbing some of the carbon from the cast-iron, and this is done by heating it in combination with powdered hematite; so far as it is affected it becomes a material approaching wrought-iron. The cost of the process and the limited extent to which the casting is affected militates against the extensive use of this material.

Chilled castings are made by suddenly cooling parts of a casting, and so rendering them hard and durable, such as the tyres of railway wheels, this being done by placing iron blocks in the mould, by coming into contact with which the rapid cooling is effected. The nature of the change is the same as that mentioned in connection with turning grey into white pig-iron. Leaving aside all these more uncommon forms of cast-iron, we find the ordinary metal as supplied by the founder as a building material is hard and brittle, not weldable nor malleable, weak in tension and imperfectly elastic, yet it is strong in compression, can be melted and moulded with very considerable accuracy, can be wrought with steel tools, if cared for will last for an indefinite length of time, is fireproof, and compared with other forms of iron is cheap.

I will next direct your attention to the behaviour of this material under stress.

Remelting increases the tensile strength, but also the cost of material. Keeping the metal for some time in a state of fusion increases the tensile strength, and, as it cannot add greatly to the cost, further investigation in this direction would be of interest. One set of experiments shows that the metal kept half an hour in fusion gave a strength of 7 tons per square inch, and for hours a strength of 16 tons. Cast-iron has a tensile strength ranging from 4 to 11 tons, the average adopted usually being 7 tons. Malleable cast-iron will give results up to 25 tons, and some American irons up to 20 tons per square inch.

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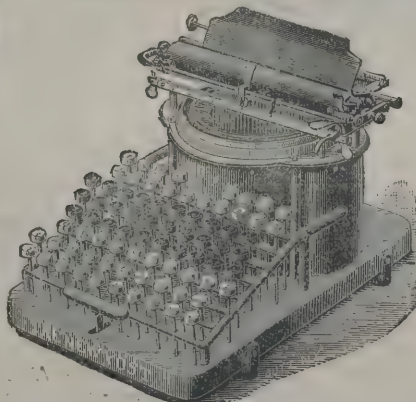
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Under a shearing stress, cast-iron is about three-fourths as strong as wrought-iron, varying from 12 to 18 tons per square inch, the average being 15 tons.

Flexure, *i.e.* the complicated stress endured when it acts as a long column.—For information on the subject of columns generally, I must refer you to Hodgkinson's experiments and Box's practical treatment of it in his work on the strength of materials. It may be mentioned, however, in general terms and with certain modifications, that the strength of a column varies according to the strength of the material of which it is composed, directly as the fourth power of its diameter and inversely as the square of its length. The first factor is obtained, of course, from experiment, and while cast-iron is much stronger as a short column than wrought-iron, when the length is twenty-four times the diameter they are equal, and beyond that wrought-iron becomes the stronger.

Under stress as a beam, cast-iron as far as strength is concerned does not compare unfavourably with wrought-iron, being as 17 is to 22; it has, however, a fatal defect in this capacity, viz. its want of elasticity. It is now little used as a beam, although in the comparatively few cases which occur of a constant dead load to be carried, there is no reason why with proper precautions it should not answer very well. Mod. of rupture varies from 15 to 50 tons.

Impact, or the sudden application of a load, concerns both beams and columns. The laws relating to impact and to resilience, which is the power to resist impact, are rather remarkable, but are derived from experiments upon beams. Experiments upon loaded columns exposed to lateral shocks have not, so far as I know, been made, and as a loaded column will not be affected in the same way as a loaded beam under impact, further investigation in this direction is necessary. The chief points to be noted regarding this subject are as follows:—A load placed on a beam and released suddenly causes twice the deflection caused by a dead load of the same weight. The resilience of a beam varies directly as the depth, the breadth and the length of the beam, and, therefore, as its weight between the points of support. It is the same whether the load be applied at the centre or any other part of the beam. It varies as the square of the deflection. It is increased by the presence of a dead load up to a certain point. From these

laws it will be at once evident that other things being equal, a stiff inelastic beam or column is less able to resist a shock than a long and unyielding one, and that cast-iron as a material is eminently weak in powers of resilience.

It is found that most materials under stress exhibit a strain or alteration of form which up to a certain point is fairly proportionate to the stress it endures, either in tension, compression, or as a beam, but beyond this point that the deformation increases in a greater ratio than the load. This point is termed the limit of elasticity, which it is of considerable importance to be able to determine. In the case of wrought-iron and steel, whose elasticity is tolerably perfect, this point is well defined, but with cast-iron it is not the case. To make the matter clearer, I will submit a typical stress diagram of each. [The lecturer here illustrated the point by diagrams drawn on the blackboard.] Thurston, an American writer on materials, says that the elastic limit is more important than the ultimate strength for general purposes, and that the diagram of deflection of cast-iron being a parabolic curve, he has been accustomed to assume that the elastic limit may be taken at a point at which a tangent to the curve makes an angle of 45 deg. with the axis. How he arrives at that conclusion it is difficult to say. A glance at the diagram is sufficient to show that there can be no defined elastic limit, and therefore it must be left out of the question in connection with the strength of cast-iron.

Permanent set is that deformation which takes place in material under stress, which remains even after the load has been removed. With cast-iron the diagram shows that it commences apparently as soon as the pressure commences, and increases like the deflection in a higher ratio than the loads, the diagram also forming a parabolic curve, so that this affords no assistance in determining the elastic limit.

It has been ascertained very clearly that, as the size of a casting increases the proportionate strength diminishes. This will be seen from the following series of experiments upon different sizes treated as beams:—

Inches square	$\frac{1}{2}$	1	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
	1'35	1	1'90	1'84	1'78	1'74
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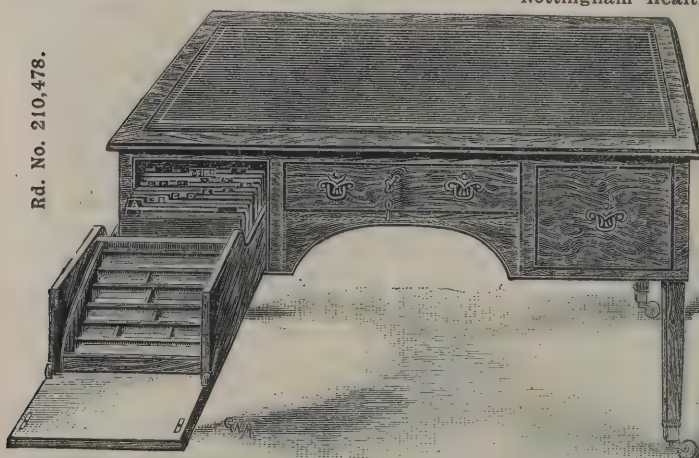
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ably. When a casting cools, the crystals arrange themselves at right angles to the surfaces, so that in a thin flat plate there would appear two diagonal lines connecting the corners where the angles of the crystals change. These form lines of weakness, so that with a flat-ended cylinder lines of weakness would also occur at the corners. It is, therefore, advisable to avoid as far as possible angles and corners of all sorts. In a round-ended cylinder, for example, no such lines of weakness occur. It is also of great importance to avoid any sudden change of size in a casting; where it is necessary that the size should vary in the different parts, the changes should be gradual and projections and angles avoided as far as possible. To pour large castings so that there shall not exist an internal stress is a difficult part of the founder's art, and is effected by removing the sand first from the thicker parts which otherwise would cool more slowly than the rest.

The strength of any material depends amongst other things upon the way in which the load is applied. If a constant dead load be represented in its effects upon a beam by 1, then it has been found by experiment that if the same load be moved off and on, its effect may be represented by 2, and if accompanied by a shock will be increased to 4. And, further, that if the load be applied first in one direction and then in the other, its effect would be equivalent to 4 and 8 according as it was applied without or with a shock.

To find factors of safety is one of the most difficult problems in connection with material of construction. Rivington gives the following table for cast-iron:—

Girders	Board of Trade—Dead load	..	..	3'6
Pillars	Stoney	..	..	6
Watertanks	"	..	..	6
Crane posts	"	..	..	4
Pillars with vibration	Live load	..	..	8
" " impact	"	..	..	8
" " impact	"	..	..	10

The difference between the Board of Trade and Stoney's factor for girders is noticeable. Thurston recommends as a minimum:—

Dead loads.	Live loads.	Dynamic.
4	7	10 to 15

Box has for—

Dead loads.	Intermittent.
3	One direction.
	Without shock.
	With shock.
	9
	18

The following require consideration in fixing the factor of safety for cast-iron:—Defects in the material, inequality in

distribution of stress, manner in which the load is applied position and importance of the structure, if a column whether exposed or not to lateral shocks. I am of opinion that the factors of safety suggested by Box are not too great, if the failure of the structure would involve loss of life and if the conditions of loading and of impact were unfavourable. The behaviour of cast-iron under fire is a matter of considerable importance to the architect. In Berlin instructions were issued by the Police Department that unprotected cast-iron columns were not to be used, but were to be superseded by wrought-iron columns, cast-iron columns surrounded by wrought-iron with air space between, or stone set in cement. Herr Bausenger, in consequence of this curious edict, carried out a series of experiments upon various materials in fire, suddenly cooling them with water. He found that cast-iron stood the test best, wrought-iron collapsing, and that out of granite, limestone, sandstone, concrete and brick, concrete was the best. After this probably the Police Department retired from their position.

The principal tests now employed are those for strength in a testing machine, and, on account of the facility offered, they are usually tested as beams of a size 1 inch by 1 inch, by 3 feet, or 2 inches by 1 inch, by 3 feet. Specifications for cast-iron usually require a strength of from 670 to 780 lbs. for the first, and from 25 to 30 cwt. for the second. Professor Kernot suggests 750 lbs. for the first, and points out correctly that four times that cannot be expected from the larger specimen. He considers 22 cwt. ample for the purpose, with a deflection of not less than $\frac{1}{8}$ inch for the small bar and 5-16 inch for the large one. I will conclude this paper with a few remarks upon cast-iron as a suitable vehicle for ornament.

In the eyes of Ruskin cast-iron is a barbarity and quite beyond artistic treatment. However, all are not, fortunately, of this opinion, there being many who consider that cast-iron, vulgar as it frequently appears, has a quiet beauty of its own, provided it is treated in the right way. It cannot, of course, rank with bronze, for the rust of iron has nothing to command it artistically, so that it must rely chiefly upon the form of its design for its claim to be admired; nothing in its outside adornment should distract the attention from its outlines or decorative treatment, nor should it impose upon the public by attempting to disguise the nature of the material such as painting it to resemble bronze or granite. And as the outside colouring should be quiet and dull, proclaiming as far as possible that the material is cast-iron and nothing else, so with the form and decorative treatment, all should be in keeping with

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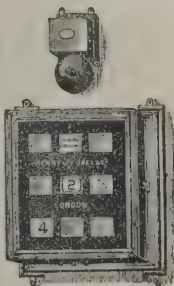
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the nature of the material designed from the fullest knowledge of its manufacturing, its weakness and its strength. I will conclude by quoting Mr. W. R. Lethaby upon this point. He writes:—"1. The metal must be both good and carefully manipulated; 2. The design must be thought out through the material and its traditional methods. 3. The pattern must have the ornament modelled, not carved, as is almost universally the case now, carving in wood being entirely unfit to give the soft suggestive relief required both by the nature of the sand-mould into which it is impressed and the crystalline structure of the metal when cast. 4. Flat surfaces, like grate-fronts, may be decorated with some intricacy if the relief is delicate. But the relief must be less than the basis of attachment, so that the moulding may be easily practicable, and no portions invite one to test how easily they may be detached. 5. Objects in the round must have a simple and substantial bounding form with but little ornament, and that only suggested. This applies equally to figures. In them homogeneous structure is of the first importance."

THE BISHOP'S PALACE, WAKEFIELD.

At a recent meeting of the Works Committee of the Wakefield Town Council some correspondence was read relative to the occupation of the Bishop's Palace without a certificate being obtained as to its fitness for human habitation. A letter addressed to the chairman of the committee from Mr. William White, London, architect for the Bishop's Palace, stated that he had inspected the premises, and offered explanations with respect to the work which had not been carried out in accordance with the plans approved by the committee, and he asked that the Bishop might be allowed to enter into immediate occupation pending certain alterations being carried out with respect to the sanitary arrangements. The Bishop of Wakefield also wrote asking that the necessary certificate for the occupation of the house might be granted without the structural alterations being insisted upon.

It was proposed that the city surveyor should be instructed to withhold his certificate under section 60 of the Wakefield Improvement Act, 1877, until the building was made in conformity with the plans as approved. It was moved as an amendment that the question of the city surveyor issuing his certificate be referred to the Council for consideration. The

amendment was put to the meeting and declared to be affirmed, and was then put as the amended proposition and declared to be carried.

At the meeting of the Council, on its being proposed that the minutes of the General Works Committee be confirmed,

Alderman Carter moved, "That no certificate be granted for the occupation of the Bishop's Palace until the drainage and sanitary arrangements are completed and the building regulations now in force properly carried out." He pointed out that when the plans for the Palace were placed before the General Works Committee several members remarked as to the lowness of the rooms, but having no power to order them to be made higher, the plans were allowed to pass. When the building was completed it was stated there were rooms lower than the dimensions specified on the plans. The servants' hall was 7 feet 9 inches from floor to ceiling, and there were other rooms the same height. He found that the lodge at the entrance-gates was also 7 feet 9 inches, and even if the Palace was allowed to pass, he thought something should certainly be done in regard to the lodge. In the by-laws under which the Corporation had been working for many years, it was stated that the height of every habitable room should be 8 feet at least. Then on page 8 of the epitome of the Improvement Act, 1877, it was pointed out that no new building could be occupied as a dwelling-house until the drainage was completed, and until the same had been certified in writing by some officer of the Corporation to be fit for habitation, the penalty being 5*l.*, and the continuing penalty 40*s.* for each day. On March 27 he moved that the matter be referred to the Council for decision, believing that, as difficulties were likely to arise, and that it was rather too much to take a quiet vote in a hole-and-corner manner, it would be better to have a full expression of opinion. He did so all the more readily because for some time past the Corporation had been trying to do work under that Act of Parliament by compelling builders of houses who did not comply with the by-laws to alter them, and he thought it would not do to have one law for the rich and another for the poor. No one in that room wished to perform better services for the Bishop than himself, but the ratepayers and the local architects expected them to do their duty, whether it was to a king or a peasant. On Wednesday, April 5, the General Purposes Committee was called together at five o'clock, and the meeting took place at 7.30. Sixteen members turned up. He had no doubt the meeting was called with the best intentions, as the Bishop was placed in a very peculiar position. When

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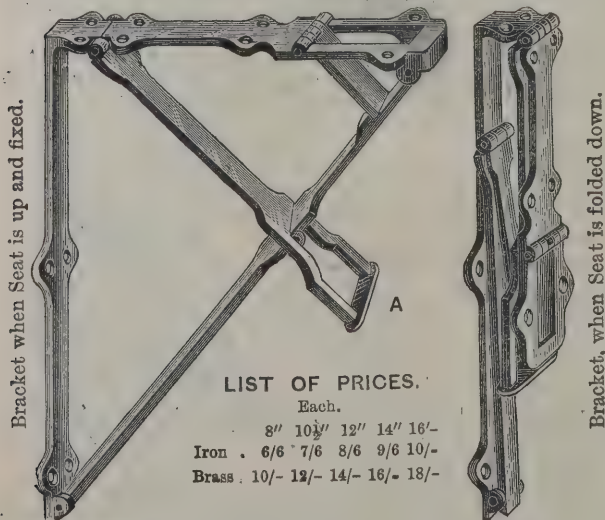
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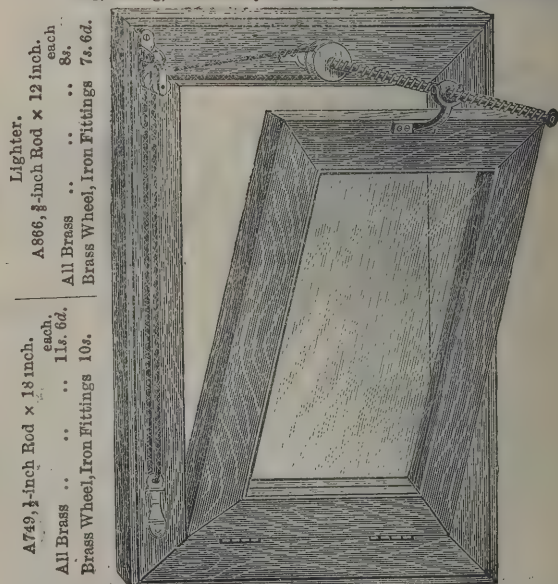
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the Town Clerk at that meeting told them that by-law 15, under which the Corporation had been working for years, was bad, he was amazed. He hoped, therefore, every despatch would be used to get new by-laws, and that the Corporation would no longer be placed in such a predicament. Of course the erection of the Palace had been carried out under the supervision of London architects, with foreign builders and their own clerk of the works. For his part he believed that Wakefield architects would have done the work better. If he were the Bishop he would be under no obligation to the Council, but would alter the height of the rooms himself and for ever remove the stigma of the Palace being pointed out as a precedent. His resolution would place the Bishop in a most difficult position, but as members of the Corporation they had frequently unpleasant duties to perform, and so long as he was a member of the Corporation he should try to perform his duty in seeing that all the laws were properly carried out.

Mr. Harrison seconded.

Mr. Bolton: I should like to ask if it is a fact that the certificate has been granted.

The Mayor: No; permission has been given to occupy the place. That is all.

Mr. H. Smith: Can we override the resolution passed by the General Purposes Committee? I apprehend that committee has the same powers that we have in this Council to-night. My contention is that Alderman Carter is entirely out of order. The General Works Committee minutes have already been passed.

The Town Clerk read the minute passed at a meeting of the General Purposes Committee on April 5 as follows:—"That it be recommended to the Council that the Bishop of Wakefield be permitted to occupy his residence in Westfield Road upon an undertaking being given that the windows should be altered in accordance with the provisions of the Wakefield Improvement Act, 1877, and the sanitary arrangements carried out as suggested in the letter of Mr. White on the 11th ult. and to the satisfaction of the city surveyor."

Mr. Yates asked if it was not very unusual to call a special meeting of the General Purposes Committee to pass either plans or anything else in connection with the erection of residences? That fact itself denoted there was one law for the rich and another for the poor.

Alderman MacGirr said that the meeting of the General Purposes Committee was called in the first instance at his request, with the sanction of two or three of the members, and

they acted perfectly within their right. While admiring the consistency of Alderman Carter, and the boldness with which he had taken the subject up, he must state that, having looked at the question with an impartial eye and without preference on either side, he had partly abandoned the official rule which should govern them in that case, and voted in favour of the recommendation of the General Purposes Committee. He had heard the Bishop's residence called both a palace and a penitentiary, and it was certainly more like the latter than anything palatial. It did not say much for those who were called foreigners; nobody in Wakefield seemed to have had anything to do with it. He very much regretted that the work was not placed in the hands of some local and competent architect, for it would have been much easier to have approached him, and the members of the Corporation would have taken greater interest in the progress of the buildings. He had explained the reason that induced him to vote for the relaxation of the principle which he, along with others, had strenuously advocated in the past. In the first place, some misunderstanding appeared to have taken place in regard to the construction of the by-laws; that was to say, the London architect informed them the rooms were 8 feet 9 inches from floor to floor. It appeared to be necessary for bishops and gentlemen who required abstruse study and reflection that all the rooms should be noiseless, consequently some of these had been padded and otherwise encumbered with substances that had broken the noise of those who might be walking about, but had interfered with the contour of the rooms and the height of the ceiling. But the fact that there was a large amount of space around the building and plenty of ventilation, induced him to relax his opposition. Then the Town Clerk told them the other night that the by-laws were not worth the paper on which they were printed. The Corporation had absolutely no power to compel any alteration of the rooms, and were utterly unable to vindicate the integrity of their by-laws. If the rooms were only 6 feet 9 inches the Corporation were powerless in the matter, and his idea was that the members should get the by-laws amended as quickly as possible. Let the Corporation therefore gracefully retire from an opposition they were unable to maintain.

The Mayor said he could testify to the fact that the Town Clerk had held the same opinion, that the by-laws did not apply in a case of that kind, ever since he entered the service of the Corporation. There were exceptional circumstances surrounding the Palace which enabled them to withdraw their opposition without constituting a precedent for future cases.

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The Palace could never be closely surrounded by buildings, so that there would always be plenty of air space, and it was much better to have the rooms 7 feet 9 inches with plenty of ventilation than 8 feet without ventilation.

Alderman Carter said it was a deplorable thing to allow what ought to be one of the finest buildings in the town to have rooms only 7 feet 9 inches in height.

The resolution was put to the meeting and declared lost by seventeen votes to five.

Mr. Harrison observed that not a word had been mentioned about the cottage near the gates. He did not complain so much about the Palace as about that, and did not think the committee would pass plans for another such cottage in Wakefield.

Alderman MacGirr said the statement of Mr. Harrison was a mere quibble, for the lodge was part and parcel of the undertaking. He was right in calling attention to it, but he should certainly not dissociate one from the other. At the same time, it should be a moral obligation upon the promoters to make the lodge as habitable as any other cottage house in the city.

Mr. Brown remarked that the lodge was not really habitable; it was more like a place for keeping canaries in. It was never intended for two persons to live there day and night, in fact, it was impossible for them to do so to be healthy. He moved that the lodge be not occupied until it was altered in accordance with the existing by-laws.

Alderman Carter seconded.

Alderman MacGirr: I have just heard such an account of this dog-hole of a lodge, which is not fit for habitation, that I am going to support the resolution. I am told it is utterly incompatible with the decent comfort of a man and his wife.

Mr. G. A. Moorhouse: Is the lodge carried out in accordance with the plans?

The Town Clerk: I am not aware of it.

Alderman MacGirr added that the Corporation had helped the promoters very handsomely out of the difficulty in regard to the Palace, and surely they ought to remedy the matter as to the cottage in some way.

The Mayor expressed his surprise that a member should one minute say "it was a mere quibble," and then turn round and remark that the lodge ought to be considered separately.

Alderman Rhodes said that as the plans for both places had passed the committee he did not see how the Corporation could debar the gate-keepers from occupying the lodge. No one had ever pointed out until that night that the lodge was

unfit for habitation. He did not know how they would look in the papers, to find that in the first instance permission was given for the plans to pass and then at the finish the Corporation objected to the lodge being occupied.

Mr. G. A. Moorhouse observed he had been as strenuous in his adherence to the by-laws as anyone, but he should never try to enforce a law which did not exist. It would be a great inconvenience and entail considerable expense if the promoters of the Palace were required to alter the lodge.

It was decided that no action be taken in regard to the lodge.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

7765. John Whitehead, for "An improved automatic door-fastener."

7813. Arthur Lowe, for "The combined cross-grooving and stop-grooving plane."

7868. John Abraham Noel, for "Improvements in gully and trap-heads, and in grids therefor."

7930. John Horace O'Brien, for "An improved lock-nut and bolt."

7988. William Murison, for "Automatically fixing (setting open) in two or more positions any lid-flap, sash-hatch, &c. viz. improved pivot-hinge."

8014. George Breeze, for "An improved sash-fastener."

8021. Melvin Albert Panly, for "An improved fire-escape."

8031. James Gerrans, for "Improvements in the construction of cistern valves."

8098. Martin Higgins, for "Improvements in locks."

8107. Arthur Warner, for "Improvements in mutation lever locks."

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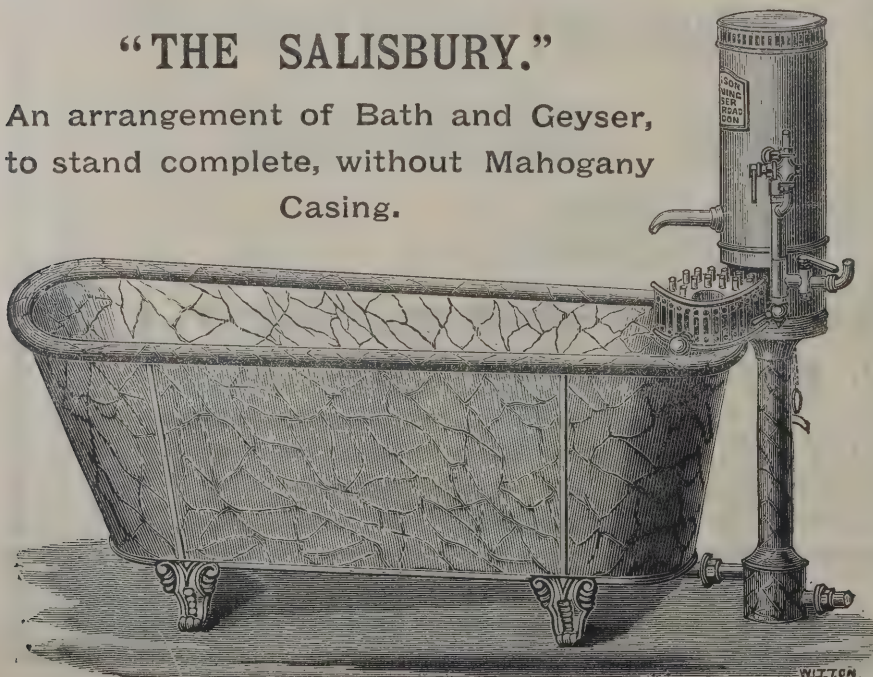
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COMPETITIONS OPEN.

LEEDS.—May 31.—Designs are invited for Public Baths. City Engineer, Municipal Buildings, Leeds.

LUDLOW.—May 30.—Prizes of 25%, 15% and 10% are offered for Schemes for Disposal of Sewage. Mr. John H. Williams, Town Clerk, Ludlow.

ROCHESTER.—June 26.—Designs are invited for the Sewerage of the Village of Borstal. Premiums of 25 Guineas and 10 Guineas. City Surveyor, Guildhall, Rochester.

WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50% and 25%. Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10%. Mr. Horatio Brevitt, Town Hall, Wolverhampton.

CONTRACTS OPEN.

BARMOUTH.—May 12.—For Constructing Waterworks. Messrs. Thomas Roberts & Son, Civil Engineers, Portmadoc.

BEDFORD AND COLCHESTER.—May 20.—For Painting, Limewhiting, Colouring, Paperhanging, &c., Barracks. Colonel O. Ferguson, Royal Engineer Office, Colchester.

BELPER.—For Supplying and Fixing Iron Fire-escape Staircases. Mr. J. B. Mason, Architect, Duffield, Derby.

BERMONDSEY.—May 15.—For Supplying Broken Granite. Mr. J. Harrison, Town Hall.

BIGGLESWADE.—May 17.—For Laying Croft Adamant Pavement. Mr. T. J. Hooper, Local Board Offices, Biggleswade.

BIRDWELL.—May 12.—For Building Four Houses, &c. Mr. Walter J. Sykes, Architect, Hoyland, Barnsley.

BIRKENHEAD.—May 22.—For Building Administrative and Laundry Blocks, Isolation Pavilion and Four Ward Pavilions for proposed Infectious Diseases Hospital. Mr. Charles Brownridge, Borough Surveyor.

BLACKPOOL.—For Building Showyard for Royal Manchester, &c., Agricultural Society. Mr. James Birch, Secretary 3 Brunswick Street, Liverpool.

BOURNEMOUTH.—May 22.—For Construction of Above and Underground Public Conveniences. Mr. F. W. Lacey, Borough Engineer.

BRADDOCK.—May 15.—For Building Bridge over River Fowey, Nainsford. Mr. W. R. Stephens, Surveyor, Moun Warleggan.

BRADNINCH.—May 26.—For Building Police Station. Mr. E. H. Harbottle, Architect, Exeter.

BRIGHTON.—May 16.—For Additions to Laundry at Victoria Baths. Mr. F. J. C. May, Town Hall, Brighton.

BRIGHTON.—May 16.—For Building Board School for 750 Boys, Pelham Street, and Alterations to Board School, York Place. Mr. J. W. Simpson, Architect, 10 New Inn, Strand London, W.C.

BURNLEY.—May 26.—For Enlarging Post Office. Postmaster, Burnley.

CANNING TOWN.—May 30.—For Building Keeper's Lodge at Recreation Ground. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CARDIFF.—May 17.—For Restoring and Re-seating in Oak Penmark Church. Messrs. Seddon & Carter, Architects, Bank Buildings, St. Mary Street, Cardiff.

CARDIFF.—May 22.—For Extension of Board Schools. Mr. E. M. B. Vaughan, Architect, Borough Chambers, Cardiff.

CARDIFF.—May 18.—For Building Warehouse. Mr. W. H. Dashwood Caple, Architect, 1 St. John's Square, Cardiff.

CATERHAM.—May 19.—For Painting, Cleansing and Repairing Asylum for Imbeciles. Mr. T. Duncombe Mann, Norfolk House, Norfolk Street, W.C.

CRAGHEAD.—For Building Two Houses, &c., at Craghead, co. Durham (Whole Tenders). Messrs. Plummer & Burrell, Architects, Newcastle-on-Tyne.

DARTFORD.—May 22.—For Additions to Laundry, Gore Farm Hospital. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

EAST DONYLAND.—May 17.—For Additions to National School. Plans at the National School, East Donyland, Essex.

EAST HAM.—May 16.—For Supplying and Laying Concrete Pavement. Mr. Savage, Local Board Offices, East Ham, E.

FALLOWFIELD.—May 17.—For Building Stabling. Mr. Oliver S. Holt, Secretary, London Road Station, Manchester.

FLEETWOOD.—May 12.—For Building Cottage Hospital. Mr. R. Forrester Addie, Solicitor, Dock Street, Fleetwood.

GREAT YARMOUTH.—May 16.—For Building Board School for Boys. Messrs. Bottle & Olley, Architects, Regent Street, Great Yarmouth.

HARROGATE.—For Alterations and Additions to Selbourne House, for Mr. Edwin Oldroyd. Mr. T. Butler Wilson, F.R.I.B.A., Architect, 12 East Parade, Leeds, and at Harrogate.

KENSINGTON.—May 18.—For Constructing Subway at Workhouse. Mr. T. W. Aldwinckle, Architect, 1 Victoria Street, S.W.

LEAVESDEN.—May 18.—For Building Isolation Block at St. Pancras Schools. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

LEEDS.—For the several Trades required in the Erection of Two Semi-detached Villas, Cardigan Road. Mr. F. Butler Wilson, F.R.I.B.A., Architect, 12 East Parade, Leeds, and at Harrogate.

LOTHOUSE.—May 12.—For Part Building of Christ Church. Mr. W. Watson, Architect, Barstow Square, Wakefield.

LONDON.—May 15.—For about Fifteen Temporary Iron Buildings, School Board Offices, Victoria Embankment.

LONG HANBOROUGH.—For Building Church. Mr. E. H. L. Barker, Architect, 146 St. Owen's Street, Hereford.

LUDDENDEN FOOT.—May 13.—For Building Board School. Messrs. C. F. L. Horsfall & Sons, Architects, Lord Street Chambers, Halifax.

MAGHERAGALL.—May 12.—For Renovation of Church. Mr. James Hunter, B.E., Architect, Brookmount, Lisburn.

MIDDLESEX.—May 29.—For Supplying and Delivering Broken Granite to various Railway Stations, &c. Mr. F. H. Pownall, 9 Great George Street, Westminster, S.W.

MIDDLETON.—May 17.—For Purifying House with Iron Roof. Mr. T. Duxbury, Gas Manager, Middleton.

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PETERBOROUGH.—May 13.—For Building House, Park Road. Mr. James Ruddle, Architect, Boroughbury, Peterborough.

PONTYPRIDD.—May 12.—For Building Six Cottages. Mr. Thomas Rowland, Architect, Market Buildings, Pontypridd.

PURLEY.—May 31.—For Tar-paving and Brick-edging at Cane Hill Asylum. Mr. R. W. Partridge, 21 Whitehall Place, S.W.

SHEFFIELD.—May 15.—For Construction of Urinals, Hills-brough Park. Mr. C. F. Wike, City Surveyor, Bower Spring, Sheffield.

SUNDERLAND.—May 27.—For Erecting Superstructure of Asylum. Mr. G. T. Hine, Architect, 35 Parliament Street, Westminster.

TAUNTON.—May 17.—For Building Telegraph Offices and Shops at Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

THAKEHAM.—May 22.—For Additions, &c., to Workhouse. Messrs. Scott & Cawthorne, Brighton.

TORPOINT.—May 16.—For Additions to Workhouse Infirmary. Mr. Fred. W. Cleverton, 4 Buckland Terrace, Plymouth.

TREORKY.—May 13.—For Building Mission Church. Mr. Jacob Rees, Architect, Pentre, Rhondda.

TWYFORD.—May 17.—For Construction of Passenger Station. Mr. G. K. Mills, Secretary, Paddington Station, W.

WOKING.—May 12.—For Building Post Office. Postmaster, Woking.

A COMMITTEE has just been appointed for carrying out the scheme of building a library and technical school for St. Helen's, which Colonel Gamble proposes to present to the town at a cost of 20,000*l*.

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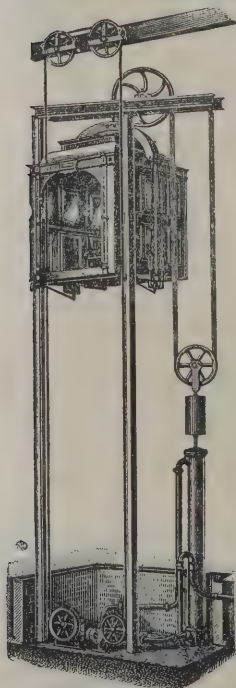
Electric Construction Corporation, Limited, engines, dynamos, pumps, steam and other pipes	£5,044	0	0
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British Insulated Wire Co., Limited, insulated cable	190	0	0
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Hatherly & Carr, Bristol	5,847	0	0
Claridge & Bloxham, Banbury	5,842	0	0
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Stephens, Bastow & Co., Limited, Bristol	5,699	0	0
W. Brock & Son, Bristol	5,500	0	0
C. Wibley, Bath	5,385	0	0
De Vere Buckingham & Co., Basingstoke	5,330	0	0
E. Chancellor, East Tiverton	5,168	0	0
Hayward & Wooster, Bath	5,171	17	0
LONG & SONS, Bath (accepted)	4,847	0	0

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W. Gibson, Exeter	£5,750	0	0
J. Seldon, Barnstaple	3,818	10	0
Perrin & Long, Bideford	3,513	0	0
S. Morse, Bristol	3,265	1	9
J. N. HANCOCK, Barnstaple (accepted)	2,740	0	0

BELFAST.

For Construction of Low-level Sewer under the River Lagan and through adjacent Lands and Streets, with Works Connected. Mr. J. C. BRETLAND, City Surveyor. Quantities by Mr. W. H. STEPHENS, 41 Donegall Place, Belfast.

Fitzpatrick Bros., Limited, Belfast	£14,000	0	0
J. Henry, Belfast	12,247	0	0
H. & J. MARTIN, LIMITED, Belfast (accepted)	12,010	0	0

BUCKFASTLEIGH.

For Building Chapel of Ease, Parish of Buckfastleigh, Devon. Mr. CHARLES GEORGE S. ACOCK, M.S.A., Architect, Totnes.

Brendon & Neal, Devonport	£2,028	10	0
Crocker & Son, Modbury	1,790	0	0
Reeves & Selwood, Totnes	1,609	0	0
Wakeham Bros., Plymouth	1,591	0	0
S. Furneaux, Buckfastleigh	1,492	16	6
Jackson & Son, Buckfastleigh	1,485	15	6
A. Wakeham, Buckfastleigh	1,483	9	6
Arcott & Jackson, Buckfastleigh	1,480	13	0
H. STEVENS, Ashburton (accepted)	1,478	0	0
J. Foaden, Ashburton	1,470	9	0

CARLISLE.

For Masonry for New Bridge over the River Caldew, for the Carlisle Urban Sanitary Authority.

R. Johnston	£396	0	0
T. Mackay	391	0	0
Beaty Bros., Carlisle	350	0	0
J. Laing, Carlisle	339	0	0
J. & W. BATY (accepted)	330	0	0
Surveyor's estimate	350	0	0

BERWICK-ON-TWEED.

For Construction of 1,400 Yards of Main Sewerage (6 inches to 15 inches Earthenware Pipes, with Manholes, &c.), at Spital, for the Berwick-upon-Tweed Urban Sanitary Authority. Mr. DICKINSON, Borough Surveyor, Berwick-upon-Tweed.

G. Simpson, Newcastle-on-Tyne	£583	6	3
H. Elliot & Son, Berwick	563	19	0
R. C. Brebner, Edinburgh	434	9	8
M. Gray & Son, Berwick	409	3	8
J. & J. Robson, Newcastle-on-Tyne	407	2	0
D. Storar, Spital	402	10	11
J. CARRICK, Durham (accepted)	322	6	3

COATBRIDGE.

For Building Post Office, Coatbridge, for the Commissioners of H.M. Works and Public Buildings.

A. Miller, East Helensburgh	£3,180	0	0
W. Purdie, Coatbridge	3,094	0	0
P. McKissock & Son, Glasgow	3,007	0	0
G. Ferguson, Glasgow	2,920	0	0
W. Shanks & Son, Coatbridge	2,814	0	0
A. Macnaughten, Paisley	2,668	0	0
Murray & Taylor, Coatbridge	2,675	0	0
W. P. Murray, Coatbridge	2,596	0	0
T. S. Bruce, Coatbridge	2,577	0	0
T. GILCHRIST & SONS, Coatbridge (accepted)	2,555	0	0

DORKING.

For Building a Pair of Cottages, Lincoln Road, for Mr. W. Beall. Mr. F. J. DIBBLE, Architect, Westfield, Dorking.

Cole	£929	0	0
Edser	895	0	0
Canter	859	0	0
Putney Bros.	842	10	0
Pledge & Sons	778	17	6
Hamblin Bros.	750	0	0
DEBENHAM (accepted)	698	0	0

DURHAM.

For Alterations to the Shakespeare British Workman, for the Trustees of the above. Mr. H. J. GRADON, Architect, Framwellgate Bridge, Durham.

F. Caldcleugh, Durham	£693	0	0
J. Shepherd, Durham	683	0	0
F. Gibson, Durham	682	0	0
J. Kell, Durham	675	0	0
G. Gradon & Son, Durham	607	10	0

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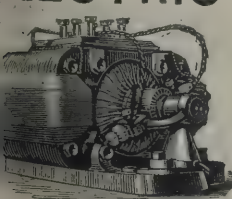
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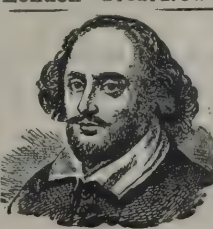
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L. Evans, Tonyrefail	450	0	0
H. Rowling, Penygraig	388	0	0
Architect's estimate	399	10	6

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For Construction of Sewers, &c., and Preparing Sewage Farm, for the Parish of Lindfield (about 2,400 yards of Pipe Sewers of 12-inch and 9-inch diameter, and about 1,300 yards of Surface Drains), and Laying-out and Underdraining about Six Acres of Land, for the Cuckfield Union Rural Sanitary Authority. Mr. WILLIAM BEACH, Surveyor, Perryment Road, Hayward's Heath.

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W. Marshall, Brighton	3,304	8	6
E. Steer, East Grinstead	2,791	18	5
J. Neave, Forest Hill	2,797	0	0
W. Langridge, Croydon	2,650	0	0
Holman Bros., Brighton	2,598	0	0
T. Adams, Wood Green	2,497	0	0

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For Reinstating after Fire at the White Hart Beerhouse, for the New London Brewery Company, Limited. Mr. WILLIAM J. INGRAM, Architect, 44 Theobald's Road, Bedford Row, W.C.

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Nightingale	325	0	0
White & Co.	325	0	0
W. Rowe	300	0	0
E. R. Palmer	297	0	0
J. Knight	277	0	0
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For Alterations and Additions to the Old Farm House, for The New London Brewery Company, Limited. Mr. WILLIAM J. INGRAM, Architect, 44 Theobald's Road, Bedford Row, W.C.

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For Pulling-down and Rebuilding the Prince Regent Public-house, Regent Street, and Two Houses adjoining, Doris Street, Lambeth, for Mr. George Evans. Mr. W. M. BRUTON, Architect, 171 Queen Victoria Street, E.C.

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Pritchard & Renwick	3,700	0	0
Burman & Son	3,572	0	0
Whitehead & Co.	3,560	0	0
Hart Bros.	3,500	0	0
W. Smith	3,454	0	0
Godson & Son	3,404	0	0
EDWARDS & MEDWAY, Lambeth (accepted)	3,390	0	0

For Alterations to the Two Brewers Public-house, Goswell Road, E.C., for Mr. Pannifer. Mr. W. M. BRUTON, Architect, 171 Queen Victoria Street, E.C.

Pritchard & Renwick	£742	0	0
G. S. Archer	685	0	0
Whitehead & Co.	645	0	0
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W. Rowe	£210	0	0
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T. Potter & Sons . . . £352 0 0
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T. Potter & Sons . . . 485 0 0
Wenham & Waters . . . 416 0 0
Comyn, Ching & Co. . . . 295 6 0
J. & F. May . . . 295 0 0
W. G. Cannon . . . 285 0 0
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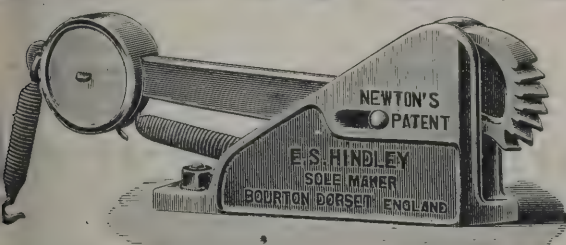
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Gayhurst Road.

T. Potter & Sons	£597	0	0
G. Davis	470	0	0
Comyn, Ching & Co.	464	10	0
J. C. & J. S. Ellis	462	15	0
A. M. Perkins & Co.	461	10	0
Rosser & Russell	450	0	0
J. & F. May	433	0	0
J. F. Clarke & Sons	391	0	0
Purcell & Nobbs	343	0	0

Sussex Road.

Z. D. Berry & Sons	398	10	0
Rosser & Russell	394	0	0
W. G. Cannon	375	0	0
J. & F. May	370	15	0
C. P. Kinnell & Co.	355	0	0

For Erecting Casual Wards at Millman Street, Chelsea, for the Guardians of the Poor of Chelsea. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

Shillitoe & Son	£10,380	0	0
G. Wade	10,182	0	0
Leslie & Co.	9,797	0	0
W. H. Smith	9,543	0	0
W. Johnson & Co.	9,457	0	0
J. Allen & Sons	9,270	0	0
C. Miskin	9,103	0	0
E. P. Bulled & Co.	9,000	0	0
J. & C. BOWYER, Upper Norwood (accepted)	8,685	0	0

PEMBROKE DOCK.

For Building Church at Pennar, Pembroke Dock. Messrs. THOS. NICHOLSON & SON, Architects, Hereford.

J. R. Thomas, Pembroke Dock	£1,944	0	0
John Davies, jun., Tenby	1,757	0	0
William Davies, Tenby	1,717	0	0
Davies & Morgan, Pembroke	1,687	0	0

No Tender accepted.

PERTH.

For Construction of Outfall Sewer along Tay Street and Shore Road, for the Police Commissioners. Mr. ROBERT M'KILOP, Burgh Surveyor, 3 High Street, Perth.

R. C. Brebner, Edinburgh	£5,457	0	0
D. & R. Taylor, Perth	5,415	17	6
R. Brand & Son, Perth	4,935	0	0
Fraser & Morton, Perth	4,682	7	3
G. Mackay & Son, Crieff	4,697	8	3
Henderson & Duncan, Edinburgh	4,413	12	2
W. G. Flett, Glasgow	4,243	12	10
L. & W. MacDonald, Inverkeithing	3,909	2	11
J. Paton & Co., Glasgow	3,985	2	8
J. Drysdale, Glasgow	3,785	5	11
A. Brunton & Son, Inverkeithing	3,653	3	5
P. Irvine, Perth	3,556	12	4
J. MELLON, Perth (accepted)	3,513	0	0

MAIDSTONE.

For Laying-out Athletic Ground, Maidstone. Messrs. J. TOOTELL & SONS, Surveyors, Maidstone.

J. Bowles, Battersea	£5,200	0	0
Johnson & Co., Dover	4,990	16	8
H. H. Greenhill, Kensington	4,871	1	8
G. J. Slade, Maidstone	4,800	0	0
J. Neave, Forest Hill	4,738	0	0
W. J. Botterill, Cannon Street	4,113	11	8
J. Farrow, Maidstone	3,783	12	8
W. Neave & Son, Paddington	3,748	0	0
W. Jenner, Sutton	3,215	5	0
J. T. S. Stone, Maidstone	3,189	10	10
J. Band, Grays	3,166	0	0
Wallis & Sons, Maidstone	3,130	0	0
Meston Bros., Parliament Street	3,117	10	0
Garlick & Horton, Sloane Street	3,113	14	2
A. N. Pryor & Co., Maidstone	2,800	0	0
W. Coker, Halling	2,646	13	7
A. T. Catley, Lloyd Square	2,200	0	0
Brewers & Packham, Plumstead	2,200	0	0
W. MEATS, Sandgate (accepted)	2,200	0	0
W. H. Wheeler, Southwark	2,075	0	0
J. Gott, West Preston	1,392	11	8

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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For Building Carriers' Factory, for Mr. Fred Corby, Church Street. Mr. H. A. COOPER, Architect, Rushden.

R. Marriott	£977	0	0
Bayes & Son	966	0	0
T. Swindall	955	0	0
T. & C. Berrill	953	0	0
H. Sparrow	945	0	0
H. KNIGHT (accepted)	918	0	0

SUTTON COLDFIELD.

For Improvement Works at Wylde Green, Sutton Coldfield. Mr. C. F. MARSTON, Surveyor.

Highbridge Road.

Hughes & Son, Dudley	£823	7	6
Cruwys & Hobrough, Gloucester	802	17	9
G. Law, Kidderminster	787	0	0
J. White, jun., Handsworth	712	17	0
J. Biggs, Hockley	690	0	0
Curral & Lewis, Birmingham	676	0	0
JONES & FITZMAURICE, Birmingham (accepted)	600	0	0

Highbridge Road.—Contract No. 2.

Hughes & Son	1,965	16	9
Cruwys & Hobrough	1,891	17	7
G. Law	1,823	0	0
J. White, jun.	1,793	17	8
Curral & Lewis	1,695	0	0
J. Biggs	1,609	0	0
JONES & FITZMAURICE (accepted)	1,487	0	0

Station Road.

J. White, jun.	814	5	9
Hughes & Son	798	10	0
Cruwys & Hobrough	752	5	9
G. Law	747	0	0
Curral & Lewis	656	0	0
J. Biggs	650	0	0
JONES & FITZMAURICE (accepted)	568	0	0

Station Road.—Contract No. 2.

J. White, jun.	1,953	1	0
Cruwys & Hobrough	1,918	18	3
G. Law	1,803	0	0
Curral & Lewis	1,663	0	0
J. Biggs	1,600	0	0
Hughes & Son	1,504	8	0
JONES & FITZMAURICE (accepted)	1,515	0	0

SOUTHAMPTON.

For Enlargement of Infant School Buildings at Pear Tree Green, near Southampton, for the St. Mary Extra School Board. Messrs. W. H. MITCHELL, SON & GUTTERIDGE, Architects, Southampton.

W. H. CHAPMAN, Woolston (accepted) £894 0 0

For Enlargement of the Boys' School for the Honnel School Board. Messrs. W. H. MITCHELL, SON & GUTTERIDGE, Architects, Southampton.

H. Carden, Southampton £717 0 0

C. & A. Witt, Bitterne 615 0 0

J. Hinton, Woolston 610 0 0

H. Cawte, Shirley 607 0 0

H. STEVENS & CO., Southampton (accepted) 598 0 0

WALSALL.

For Building Three Chapels and Entrance Lodge for Cemetery, Ryecroft, Walsall. Quantities by the Borough Surveyor.

Chapels.

H. M. Hughes, Birmingham £2,841 0 0

Lodge.

Hunter, Willenhall 570 0 0

TRADE NOTES.

MESSRS. LAING, WHARTON & DOWN, of 82A New Bond Street, W., have just received the contracts for electrical installations, or other electrical work, at the following places:—Messrs. Armitage & Rigby, Mount Street, Manchester; Messrs. Pullar & Co., Mount Street, Manchester; Messrs. Crase, Calvert & Thompson, Princes Street, Manchester; Messrs. Knight & Son, Aldermanbury, E.C.; the Chartered Bank of India, Old Broad Street; the Langbourne Restaurant, Gracechurch Street; Henlow Grange, near Hitchin, with complete generating plant driven by water-power; the old and new Post Offices, Brighton, under the supervision of Mr. W. H. Preece.

THE new temporary hospitals, Burton-on-Trent, are being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues, supplied by Mr. E. H. Shorland, of Manchester.


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ILLUSTRATIONS.

THE IMPERIAL INSTITUTE.*

THE JOHANNESBURG EXCHANGE.

THE IMPERIAL INSTITUTE.

THIS building was formally opened by Her Majesty the Queen on Wednesday. It is a matter of history now that the building was intended as a jubilee memorial. It may, however, be of interest to refer briefly to the work in selecting the site and arranging for a building worthy of the occasion.

One of the earliest questions with which the organising committee had to deal was that of the selection of a suitable site. It was urged by many prominent subscribers that the Institute should be built in a central position within the area of the City of London, if possible. But the committee had to keep in mind the all-important matter of cost. Inquiries showed that there was no possibility of acquiring an adequate area of ground, either in the east or west central districts, for any sum of money falling within the limits of the funds likely to be received. Several sites were proffered, but in no case did the price asked fall short of a quarter of a million, and, even had the committee been able to give such a sum, the area provided did not at all approach the requirements of the Institute. The committee consequently had to give up the idea of obtaining a central site, and directed their attention to the property at South Kensington held in trust by the Commissioners of the Exhibition of 1851. It was represented to that body that the Imperial Institute might reasonably advance a claim for the grant of a site of sufficient magnitude for its purposes from the land purchased with the surplus proceeds of the first International Exhibition. The appeal met with a prompt response. The Commissioners offered an extensive site, at a nominal rent, under certain conditions which were accepted.

As soon as the lease of the site had been formally passed the committee invited architectural plans. Several well known architects sent in designs, and ultimately the judges, the late Earl of Carnarvon, Lord Herschell, Sir Frederick Leighton, Sir Frederick Abel and Mr. Waterhouse, decided to accept the plans prepared by Mr. Thomas E. Colcutt, "being of opinion

* This illustration is from a special photograph by Messrs. Bedford Lemere & Co.

that these, if thoroughly carried out, would provide a monumental structure worthy to commemorate the occasion of the Institute's foundation, as well as adequate accommodation for the various functions to be fulfilled by the building, and at a cost falling within the warranted limits of expenditure." According to Mr. Colcutt's description, "the prevailing style of the building is a free rendering of the Renaissance, and, as the amplitude of mouldings and the abundance of arabesque carvings show a decided relationship to early Italian Renaissance, it may be said that the Imperial Institute affords a characteristic example of the gradual movement towards the Renaissance, as practised in this country during the last two decades." The crowning attraction of the foreground, Mr. Colcutt adds, is the great portal surmounted by the large square tower, and capped by a dome-shaped cupola. The altitude of the tower is nearly three hundred feet, the two flanking towers being 176 feet high. Their solidity is insured by walls 9 feet thick, composed of hard bricks set in cement. Within these towers are contained tank-spaces and store-rooms, and the upper chamber of the central beacon contains a complete peal of bells, ten in number, designated, by permission of the Princess of Wales, the "Alexandra" peal. The tenor is two tons in weight, and bears the following inscription:—"Victoria R.I., 1837-1887." The other bells are named after the Prince and Princess of Wales, the Duke of Edinburgh, the Duke of Connaught, and the five children of the Prince and Princess of Wales, the total weight of the ten bells being over eight tons. As placed, the peal is the highest in the country, as the bells swing in a chamber 200 feet above the level of the ground floor of the main building. The gift was a personal one to the Prince of Wales by Mrs. E. M. Millar, of Melbourne. The only condition specified by the donor was that the bells should be rung on the birthday and accession-day of the Sovereign and the birthdays of the Prince and Princess of Wales. Mrs. Millar's wishes were carefully observed on Wednesday, for one of the items in the day's programme was the ringing of the peal at intervals during the day, and especially when Her Majesty arrived and departed.

Portland stone is used in facing the front walls, and the use of red brick enters sparingly into this portion of the work, being chiefly confined to the recesses, where it is of service in sensibly adding to the desired variations in light and shade. The principal entrance, which in itself gives character to the whole buildings, has imposing dimensions, being 17 feet wide, nearly 24 feet high, and constructed entirely of Portland stone.

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MONK'S PARK



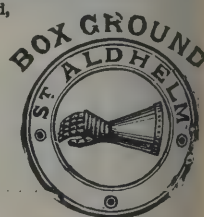
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The frieze over the arch will ultimately be covered with symbolic modellings, including a central seated figure of the Queen. The distinctive feature of the building will be the great hall, the site of which is now occupied by a temporary structure, fitted up for special use on Wednesday. Its dimensions are to be 128 feet long and 60 feet wide, the side aisles being 12 feet in width. A beautiful stairway, supported by pilasters and adorned with a wealth of multi-coloured marbles, leads to the first floor, and so the visitor may pass on to the library, the conference hall, the laboratories, the museums, and to all the conveniences which it is the object of the Imperial Institute to supply. As an example of the interest which is taken by our fellow-subjects in India, it may be noted that the eastern colonnade connecting the main building with the Indian Section has been erected at the expense of Mr. M. M. Bhownaggee, C.I.E., as a memorial of his sister. The whole structure, with the exception of the fittings, consists of fireproof materials, and care has been taken to secure every fireproof appliance. The building is illuminated throughout by the electric light, and will be heated in the winter on the most approved principles. The quadrangles at the rear—prosaic as they now seem, but by-and-by to be adorned with a wealth of flowers—form the oblong arcades, the central and north galleries, and the temporary great hall. The east end of the north-west quadrangle, which adjoins the East Indian court, is occupied by the Indian pavilion, which will make a very attractive winter garden. Finally, we may say that the total outlay upon the buildings and their appurtenances as they now exist or are in course of completion stands at 280,000*l.* An addition of 80,000*l.* to the building fund will be required before the great hall, the library and the conference hall can be completed.

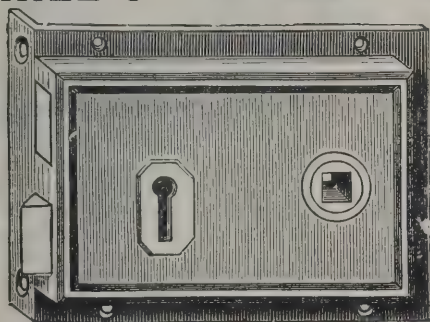
Last Saturday it seemed as if weeks would be required to place the building in proper order, but in a few days an army of workmen effected an entire change. The scaffolding in the vestibule has been taken down, the marble decorations make their full effect; we can now see the wealth of carving and design which has been lavished on the interior. Both inside and outside, what decorative art could do to add to the magnificence of the ceremonial was done.

One of the most distinctive and interesting features of the arrangements was the boudoir which was prepared for the use of the Queen and the royal family by Mr. T. G. Litchfield. The pavilion, tented with figured silks, stood in the main east corridor, and was furnished in the most luxurious manner. Curious old Chinese pictures on glass were the distinctive

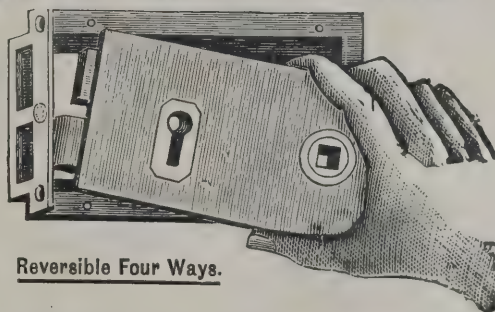
features of the scheme of decoration. The furniture of the boudoir is of the Louis XV. period, covered with delicately-figured tapestry, with which also the sides are adorned. These were by no means the only preparations made to meet Her Majesty's convenience and comfort. But passing over a mass of minor details we may speak especially of the arrangements made for the sovereign's reception in the great temporary hall. The canopy which was used to overhang the chair of state was an interesting object, gorgeous in purple velvet, and adorned with the rose, the thistle and the shamrock in emblazoned gold. But still more interesting was the throne used by the sovereign. This remarkable trophy was made for Runjeet Singh, and came into our possession after the war which led to the downfall of that potentate. It is one of the most attractive items in the collection of native Indian regalia exhibited in the Indian section of the South Kensington Museum. Nearly a hundred years have passed since the throne was made for the Lion of the Punjab, in 1799, and it still stands as a memento of Oriental magnificence and pomp. The design is octagonal, and the gorgeous fabric rests upon eight feet. The whole of the throne is covered with chased gold plates mounted on wood, and embellished with ornaments of a bold floral and foliated character. Three cushions of yellow and red velvet complete the upholstery of this imperial seat of state, and there is a further adornment in the shape of peacocks' feathers, in gold filigree holders, which are the emblems of Indian royalty.

The lifting machinery, designed and erected by Messrs. Archibald Smith & Stevens, consists of eleven hydraulic lifts with pumping engines and power storage plant. There are two handsome passenger lifts running from the ground to second floors, three lifts for reception and distribution of coals and general stores, three appropriated to the kitchen department, one for delivery of refuse from the engine and boiler-house, one heavy machine capable of raising a ton up to the central shaft of the east tower, and designed for dealing with stores and large objects for the museum, and finally a three-ton lift for raising extra large exhibits to the upper floor of the great gallery running east and west. All these are supplied by water at 700 lbs. pressure per square inch, *i.e.* equal to the pressure which would be given by a tank placed 1,600 feet high. This water is pumped by an engine into a weighted receiver or accumulator, wherein it is stored at the required pressure, and drawn off as required by any of the lifts. Immediately this occurs the accumulator, by automatic mechanism, starts the pumps, which run till the accumulator is again full, when it

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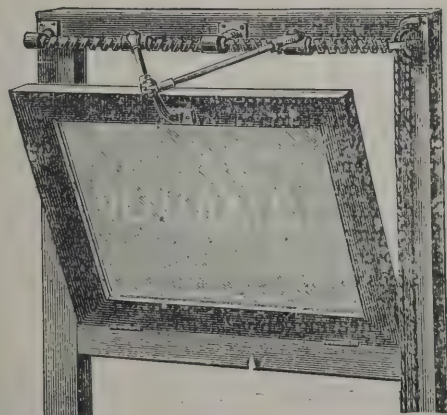
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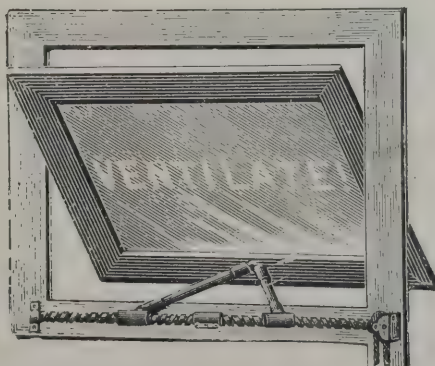
Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod on right or left side.

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automatically stops them till more water is required. All the water employed is returned by the lifts to the pumping machinery for re-use, and is therefore not wasted but kept constantly circulating. The cost of working the system is consequently only that of the coal burnt and the labour of stoking, no other attendance being required. In its outlines the system is similar to that adopted by the London and other hydraulic power supply companies, and to that on which the lifts for the Electric Railway are worked.

The electrical apparatus whereby electrical communication was made with the belfry to start the peal of bells was designed and erected by Messrs. Julius Sax & Co., Limited, under the personal supervision of Mr. Alfred Slatter, their manager, as well as the electric lighting of the Queen's lift, and complete telephonic and bell communication throughout the building.

The New Wire Wove Roofing Co., Limited, of 75A Queen Victoria Street, E.C., have covered the entire roof of the Grand Hall and the Prince of Wales's smoking pavilion with their well-known carboline and duroline, and it is certainly a tribute to the excellence of these unbreakable glazing materials that they have been specified for such important work. We hope it is a prelude to their general adoption for roofing purposes.

The following firms have carried out the principal contracts in connection with the Imperial Institute:—Sanitation, Mr. George Jennings; ventilating and heating, Messrs. Clements, Jeakes & Co.; electric lighting, Messrs. Allpress & Bellshaw; electric light fittings, Messrs. Thos. Potter & Co. and Richardson, Ellison & Co.; ironwork for the pavilion, &c., Messrs. H. Young & Co.; furniture and decoration, Messrs. Maple & Co., Collinson & Lock, Gregory & Co. and Webb & Gibbons; overmantels, grates, &c., Mr. J. Elsley; ceiling decorations, &c., Messrs. Collinson & Lock and Messrs. Jackson & Sons; mosaic work, Messrs. Burke & Co., Rusts Limited and De Grelle Hondret & Co.; lifts, Messrs. Smith & Stevens; stained-glass, Mr. Clement Heaton; wood-block flooring, The Acme Wood Block-Flooring Co., Limited.

GOLD AND JEWELLED KEY FOR THE IMPERIAL INSTITUTE.

THE manufacture of the gold and jewelled key which was presented to Her Majesty the Queen for use at the opening ceremony has just been completed by Messrs. Chubb & Sons, Limited, of Queen Victoria Street, E.C. The use of this key by Her Majesty during the ceremony symbolised the inauguration of the Imperial Institute.

His Royal Highness the Prince of Wales has himself given personal attention to the designs, which have been carried out under the direction of Sir George Chubb.

The key has been made to withdraw the bolt of a lock fixed in the block upon which a model of the Imperial Institute stands, close to the Queen. Upon the insertion and turning of this key by Her Majesty the bolt fell and automatically completed an electric circuit to the belfry, when the great peal of bells in the tower for the first time rang. The wards of the key form the letters "I. I.," the initials of the Imperial Institute. The gold and diamonds of which the key is composed have been contributed by several Colonial Governments and by India, so that different portions of the British Empire are represented by its various component parts. The head of the key is formed of gold from South Africa; the silver in the star ornaments comes from the Broken Hill Mine, Australia; the stem is formed of gold from British Columbia, while the bitt and wards are composed of the precious metal from Queensland mines. The stem of the key is encircled by a riband in red gold and a wreath of laurel leaves in green gold, both obtained from Victoria, while gold from that colony composes the ornaments upon the lid of the case containing the key. The diamonds in the key and ornaments are from South Africa, the rubies from Burmah and the pearls from Ceylon.

The design of the head is circular, with the royal and imperial crown on the summit, and the Maltese cross with fleur-de-lis of the royal coronet forming the outer border. This joins the stem of the key by descending curves, decorated with shields and the enamelled national symbols—rose, thistle and shamrock. The obverse shield bears the arms of the United Kingdom, the reverse those of England alone. The chief features of the head are the Grand Stars of the Indian and Colonial Orders given in exact facsimile on a slightly reduced scale. The Star of India has a fine diamond star of five points in the centre upon a delicate blue ribbon arranged as a garter, with the motto, "Heaven's light our guide." From this proceeds a circle of flaming rays in burnished gold, which occupies the entire inner circle of the key head. On the other side is the Star of a Knight Grand Cross of the Order of St. Michael and St. George. The centre is enamelled, and encircling it is the motto, "Auspiciis melioris ævi," whilst the cross of St. George in red enamel and rays of faceted silver and gold complete the design. The stem of the key is richly diversified

with mouldings, the inscription on the gold ribbon being, "Imperial Institute: commenced 1887, inaugurated 1893." The wards of the key are decorated in keeping with the style, and on the rim of the key head is the leading inscription, "Presented to Victoria, Queen-Empress, on the occasion of the opening of the Imperial Institute, May 10, 1893."



The case of the key is of royal blue velvet, lined a paler blue, and has on the lid an ornament of the royal and imperial crown set with diamonds, rubies and pearls, and beneath it the orb set with fine stones of pure colour. The royal sceptre and the sceptre of peace are placed behind it, with a laurel wreath encircling all. A gold shield surmounted by a crown inside the case bears an inscription describing the sources from which the gems and precious materials of which the key is made have been obtained.

LONDON CHAMBER OF ARBITRATION.

THE Corporation, on the suggestion of the Joint Committee of Management of the London Chamber of Arbitration, have made certain additions and alterations of considerable practical importance to the rules and regulations of the Chamber. A model clause for insertion in trade contracts, providing for the submission of disputes arising in connection with such contracts to the Chamber, having been settled by counsel and approved by the joint committee, a new rule had been framed dealing with arbitrations referred to the Chamber under such clause. A new rule was also found necessary for dealing with references to the Chamber from the High Court. Both these rules had been settled by counsel under the instructions of Mr. H. H. Crawford, the city solicitor. In addition, certain alterations of existing rules were recommended by the committee in regard to counsel's and arbitrator's fees. According to the rules, the fees to counsel and solicitors were to be on the same scale as those allowed in the High Court, "but for attendance at the hearing only." This last proviso has now been omitted. It has also been settled that the time occupied by an arbitrator in drawing up his award, which is not infrequently longer than the actual hearing, should be considered as a continuation of the hearing, and words to this effect have been added to the scale of fees for arbitrators and umpires.

VARIETIES.

THE Brownhills Local Board recently selected four engineers to submit schemes of sewerage and sewage-disposal for the districts of Walsall Wood, Shelfield, High Heath and Clayhanger, comprising a population of about 6,000. The local board has decided on accepting the scheme prepared by Mr. H. Bertram Nichols, C.E., of Grosvenor Chambers, Corporation Street, Birmingham, who at the last meeting of the board was appointed the engineer to carry out the works. It is intended to proceed with the work immediately. The cost of the scheme is estimated at 9,000*l*. The other schemes submitted were those of Mr. J. E. Willcox, C.E., Birmingham, Mr. W. H. Radford, C.E., Nottingham, and Mr. W. Perry, C.E., Lichfield, all of which received close attention; but the scheme of Mr. Nicholls being more comprehensive and more suitable to the requirements of the district, the board decided in his favour.

WE hear that Mr. J. W. Start, F.S.I., architect and consulting sanitary engineer of Colchester, has been called in by the Farnham United Breweries, Limited, to report upon the best means to be adopted in the disposal of their sewage. Mr. Start carried out the sewage disposal works at the West Bergholt Brewery for Messrs. Daniell & Son's Breweries, Limited, Colchester, about three years ago, which are giving great satisfaction.

THE Liverpool Watch Committee have passed a resolution requesting the Finance Committee to consider the desirability of purchasing a site, recently levelled, in Pall Mall, for a new central fire station, in lieu of that in Hatton Garden, which has long been recognised as inadequate. The cost of the site and new buildings is estimated at 60,000*l*.

THE preamble of the Aberdeen University Bill has been proved before a committee of the House of Lords. The object of the Bill is to obtain sanction for the removal of certain buildings, including the Greyfriars Church, and the extension of the Marischal College Buildings.

THE late Mr. George Dukes, who died at his residence, High Street, Bridlington, has by his will, it is understood, left to his trustees a portion of his estate, to be laid out in the purchase of lands near the towns of Bridlington and Bridlington Quay, to be appropriated as a recreation-ground and park.

THE gas explosion at Blackburn, which caused the destruction of the Crown Hotel and an adjoining shop, and the

loss of five lives, has involved the Corporation of the town in a heavy expenditure, owing to a decision which saddled them with the responsibility for the disaster. A sum of 14,000*l*. has had to be paid in compensation, to meet which the Town Council resolved to raise the price of gas for the next five years by 3*d*. per 1,000 feet.

AT the monthly meeting of the Ilkley Local Board, the Finance Committee recommended that a loan of 90,000*l*. be negotiated for the following purposes, viz.:—17,000*l*. for the purchase of Ilkley Moor, &c.; 55,000*l*. for acquiring the gas undertaking; 12,000*l*. for the improvement of the water supply; 3,000*l*. for costs in procuring the recent Act; and 3,000*l*. to enable the Board to run the gas undertaking until they procure the income from the consumers.

THE *Westminster Budget* for May 5 is exceedingly good. The article on "Mr. Robert Louis Stevenson at Work and at Play," with the illustrations from his island home, will be appreciated, as a change from the general routine of illustrated papers, in which politicians and painters are recognised as the only institutions that exist in the country.

BUILDING AND BUILDERS.

THE sum of 4,200*l*. has been subscribed, and 3,500*l*. invested towards the rebuilding of St. Peter's Church, Oldham, which was erected in 1768.

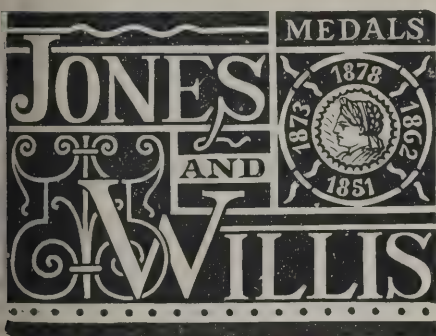
PLANS have been prepared for a building to include a free library, reading-room and swimming-baths for the inhabitants of Lochee, the late Thomas Cox, of Maulesden, having left a bequest of 10,000*l*. for the purpose.

THE old house formerly the residence of Bishop Heber, at Hubberholme, Skipton, is to be restored as a memorial of the Bishop and for the purposes of a Vicarage.

THE Leith local authority have authorised the building of a fever hospital at East Pilton at a cost of 35,000*l*., plans for which were prepared by Mr. Simpson, architect.

SOME considerable expense is to be gone to in improving the means of exit from the galleries of the Liverpool Philharmonic Society's premises, as required by the city justices.

THE Widnes Town Council have authorised the expenditure of 10,765*l*. in erecting a technical school, to include the free library, according to the plans of Messrs. Woodhouse & Willoughby, architects, of Manchester. The original estimate was 6,000*l*.

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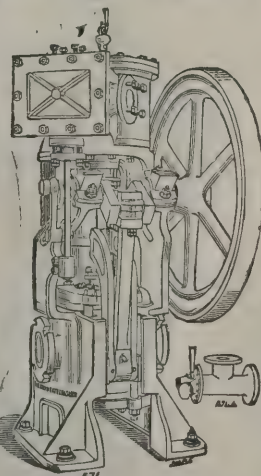
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Church
Crawley Parish Church
Corbridge-on Tyne
Parish Church
Widmore Church
S.A. Eiffel Tower, Paris
GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1886.
SILVER MEDAL—PARIS 1889.

ELECTRICAL.

At the Birmingham Municipal Technical School Mr. W. H. Whitehouse, lecturer on telegraphy and telephony, has just delivered the first of a course of eight lectures on the application of electricity to railway working.

THE *Carlisle Journal* says Ponsonby Hall, the ancient seat of the Stanleys, and now in the occupation of Mr. W. B. Turner, has been fitted up with the electric light. The electricity is generated by a turbine driven by water obtained from the Calder, on the bank of which a dynamo-house has been built. The house contains one dynamo which drives the electricity up to the hall, where it is stored in fifty-three accumulators, placed in a room specially adapted for the purpose. From this room the electric light is carried all over the house and distributed in single lights or chandeliers of three or four lights each.

THE PLYMOUTH MARBLES.

THE excellent American monthly, *Stone*, of Indianapolis, contains the following communication from Mr. G. B. Benford:—Prior to my going to England I promised you I would endeavour to get you an article on the limestone marbles of Plymouth, England. To do so and get a correct account I visited the works of J. & E. Goad, of Plymouth, England, who kindly deputed their genial foreman, Mr. Cottier, to show me over their works. Messrs. Goad Brothers have practically a monopoly of these beautiful marbles, having full control of the quarries. They have the most modern appliances for handling goods; they were then getting out columns for a New York house.

I may say that many men in this district and in Canada learned the first use of their tools in that celebrated old business house, notably the late R. Hanger, of Fairhaven and Hydeville, Victoria, one of the pioneers of the marbleised slate industry of this country, and the originator of the Fairhaven Marbleised Slate Mantel Company.

The Plymouth marbles are raised from a great band of Devonian limestone, about half a mile in width, which extends from the Devonport dockyard some six and a half miles easterly, to a place called Sherford. Associated with this run of rock is an isolated patch of considerable extent at Yealmpton, and two or three smaller patches of no commercial importance. The rock

is crystalline, hard and durable; massive, as a rule, in its more central portions, and largely fossiliferous.

For centuries this limestone has been used in the neighbourhood of Plymouth for building purposes; and there are extant structures dating from the fifteenth century, which give it an excellent character as a weather stone—notably, the tower of St. Andrew's Church, at Plymouth. In the seventeenth century it was used in such large undertakings as the Plymouth Citadel; and, in fact, in all the public buildings of the town. With the slightest possible surface oxidation, it has everywhere maintained its face and texture intact.

The hardness of the material seems, however, to have militated against its use as ashlar until comparatively recent years, and its chief employment in ordinary building works has been in rubble masonry, which in the case of dwelling-houses is commonly stuccoed. That it repays, however, and admirably, the labour and cost of perfecting, a number of modern structures show, notably the Plymouth Guildhall and Municipal Buildings, the whole of the exterior masonry of which, dressings excluded, is of this stone.

The most important constructional work in which Plymouth limestone has been used is, however, the well-known Plymouth Breakwater. For this purpose new quarries were opened in the limestone at Oreston seventy years since, and wrought to such an extent for this one undertaking that over 4,000,000 tons were raised and deposited in the sea to form the gigantic mole.

The whole run of Plymouth limestone may be regarded as marble in the sense that it will take a good polish; but in practice this term is restricted to the varieties best suited for ornamental purposes and the larger blocks, the rest being used either for building or for burning into lime. Nor is it more than a century ago that attention was first directed to the value of the Plymouth limestone for ornamental uses. The one fact that throughout the Mediaeval churches of Devon, Purbeck marble is almost universally employed for enrichments, is sufficient to attest that the value and beauty of this local stone was overlooked. Just a century ago, however, a travelled visitor to Plymouth, who probably had his attention called to the stone by its use in the footways of the streets (where, after a shower of rain, being well polished by traffic, it has a strikingly handsome appearance), declared that he thought "the Plymouth marbles were more beautiful than any foreign marbles." Not many years after Polwhele followed suit; and Sir Henry de la Beche, in his "Report on Devon, Cornwall and West Somerset," speaks of some of the local marbles as "extremely hand-

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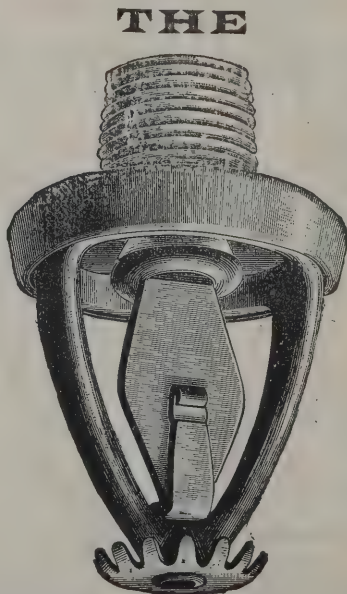
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some," and notes:—"Marbles of very great varieties of colour may be obtained, though tints of gray chiefly prevail" (hence the wide scope for judicious selection), "and they deserve to be far more extensively employed than they have hitherto been: a greater demand would cause many more varieties to be worked."

The chief points at which the Plymouth limestones are now worked—some of the older quarries having been abandoned—are Cattedown, Pomphlett, Radford, Oreston and Billacombe, the proprietors being Messrs. Goad & Co. They are not worked specially for marble, but principally for lime and building stone, at the minimum of cost and on the largest scale. It is no unusual thing to bring down thousands of tons at one blast. To procure the marbles the results of each blast are carefully examined, and the suitable blocks, ranging from five tons to 200 tons duly set aside. There is practically no limit to the size of these blocks, except the possibility of moving them; and the economical process adopted secures that there shall be always on hand a large stock of material of every needed scantle, and of the widest variety of colour and figure.

The most forcible proof that has been given of the value of this stone, in the combination of the constructional with the ornamental, is supplied by the Brompton Oratory, already cited, where plinths and columns, pilasters and capitals, panels and courses, of selected Plymouth marbles in rich variety form the chief structural features of the interior. So far as strength is concerned, it is estimated that a load of seventy tons per foot superficial is well within the limits of safety; but the stone has never been known to fail the roughest tests applied to it in the formation of heavy works like seawalls and docks.

The variety presented by the Plymouth marbles is remarkable. The "figure" of the coralline examples is often exceedingly beautiful, sometimes bizarre, especially when the favositæ occur—colloquially called "feathers." Other fossiliferous kinds, again, are picturesquely marked by the sections of included shells, and colour varied.

The range of colour is, however, most remarkable. The prevailing hue is gray of differing shades, but short of positive blue there is almost every other tint that can be named. The richest black, self or varied with white, occurs at Billacombe and Pomphlett. At Billacombe, too, there is raised a curiously brecciated variety, largely composed of creamy, semi-transparent calc spar, relieved by included fragments of reddish-brown rock. Radford supplies, among other kinds, a rich rose red of singular purity. A quarry at Kitley has yielded the most beautiful green marble in the kingdom, clouded and banded in

varying shades between lustrous oil-green and a deep olive. Then there are a tender dove colour, ranging to a delicate lilac; a black with pink veins of very effective character; gray and dove spangled and veined with rose or ruddy brown; a warm chocolate and a glowing yellow, mixed with black, of great rarity and equal beauty. In small pieces, all the colours enumerated may be obtained free from admixture and in great purity. In the larger they are commonly associated as we have indicated, and sometimes the more massive blocks really present a chromatic range of half a dozen different tints and hues.

Some idea of the capabilities of the marble for structural decoration may be conveyed by the fact that single blocks used in the columns of the Brompton Oratory are upwards of 10 feet in height by over 2 feet in diameter, weighing some five tons. But this is only the realised limit of application. Blocks can be had up to any movable and usable dimensions; while so far as quantity goes, the quarries could be worked for another half century without appreciable falling off.

THE CHICAGO EXHIBITION.

ON Monday, the 1st inst., the Chicago World's Fair was formally opened, although all the sections are not complete. In the address by Mr. Davis, the director-general, he stated that the grounds covered 790 acres, on which over 400 structures had been erected, with an aggregate capacity of accommodating upwards of 60,000 persons. The total expenditure on the exhibition amounted to over 100,000,000 dols.

President Cleveland said:—"I am here to join my fellow-citizens in congratulations befitting the occasion. Surrounded by the stupendous results of American enterprise and activity, and in view of the magnificent evidences of American skill and intelligence, we need not fear that these congratulations will be exaggerated. We stand to-day in presence of the oldest nations in the world, pointing to the great achievements exhibited, and asking no allowance on the score of youth. The enthusiasm with which we contemplate our work intensifies the warmth of the greeting we extend to those who come from foreign lands to illustrate with us the growth and progress of human endeavour in the direction of higher civilisation. We, who believe that popular education and the stimulation of the best impulses to our citizens lead the way to the realisation of the proud national destiny which our faith promises, gladly welcome this opportunity of seeing the results, accomplished by

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efforts which have been exerted longer than ours in the field of man's improvement, while, in appreciative return, we exhibit the unparalleled advancement and the wonderful accomplishments of a young nation—the present triumphs of a vigorous, self-reliant and independent people. We have built these splendid edifices, but we have also built the magnificent fabric of a popular Government whose grand proportions are seen throughout the world. It is an exalted mission in which we and our guests are engaged. As we co-operate in the inauguration of an enterprise devoted to human enlightenment and in the undertaking which we here enter upon, we exemplify in the noblest sense the brotherhood of nations. Let us hold fast to the meaning that underlies this ceremony. Let us not lose the impressiveness of this moment. As by a touch the machinery which gives life to this vast Exposition is set in motion, so, at the same instant, let our hopes and aspirations awaken forces which, for all time to come, shall influence the welfare, dignity and freedom of mankind.

THE INSTITUTION OF CIVIL ENGINEERS.

THE first of the "James Forrest lectures" has been delivered at the Institution of Civil Engineers, by Dr. William Anderson, F.R.S. The origin of the lectureship was briefly explained. During the session of 1889 the council determined to have a portrait of Mr. Forrest painted for presentation to the institution which he so long served with ability, loyalty and success as secretary, the commission being entrusted to Mr. William M. Palin. Many members expressed a wish to have an engraving of the picture, and a committee was formed outside the council to collect the funds. The surplus, amounting to about 500*l.*, was devoted to the establishment of a James Forrest lectureship, to be administered by the governing body of the institution for the time being, who select the lecturer and also the subject of the lecture.

The subject selected for the opening lecture was "The Interdependence of Abstract Science and Engineering." In the course of his address Dr. Anderson said:—"I imagine that the subject has been chosen because of an uneasy feeling which possesses many thoughtful men that this country is not keeping pace with its neighbours in engineering progress, and that we shall in the future have to pay more attention to abstract science, and its application to practice, than we have been, so

far, in the habit of doing, if we are to come out victorious from the competition, ever increasing in keenness, which we meet with from abroad, and which our system of unrestricted trade tends so much to foster. It is impossible to visit the Continent of Europe, the United States of America, or even our own colonies, without feeling conscious that, in many respects, their engineering works and their factories, to say nothing of their military and naval arsenals, exhibit the great advantages which have accrued from the employment of men of the highest scientific culture in the conduct of those enterprises—that the days are past when an engineer can acquit himself respectably by the aid of mother-wit alone, or of certain constructive instincts, which have been almost the only guides of engineers and manufacturers, even down to quite recent times. It is a matter of extreme surprise to me that so little attention is paid to the science of political economy, that not only the mass of the people, in whose hands the voting power now lies, but even in a great measure the representatives whom they elect, have no systematic training in, and are grossly ignorant of, the principles which lie at the root of national prosperity. It seems to me that a very great national danger is being incurred by this systematic neglect of political economy—an abstract science which had its origin in this country, but where its teachings are ignored in a manner which must end in disaster, the signs of the advent of which are, I fear, only too plainly apparent." Dr. Anderson went on to show how the history of abstract science, by which he intended to designate the history of researches entered into for the sole purpose of acquiring knowledge of the operations of nature and of her laws, without any thought of reward or expectation of pecuniary advantage, had had its reflex in the records of the engineering profession, and how the most recondite investigations, apparently unlikely to have any direct influence on their practice, had in course of time become of cardinal importance. He also pointed out how in these days the engineer must banish from his mind the idea that anything could be too small or too trifling to deserve his attention. "Nothing is too small for the great man" was written over the cottage once occupied by Peter the Great at Saardam. The truth embodied in that legend should ever dwell in their minds, for success, he was persuaded, lay largely in close attention to details. There was nothing in natural science which would not sooner or later prove of advantage to the members of that institution, and which the engineer would not in time turn to the moral as well as to the material advantage of the human race. A cordial vote of thanks to the lecturer was passed.

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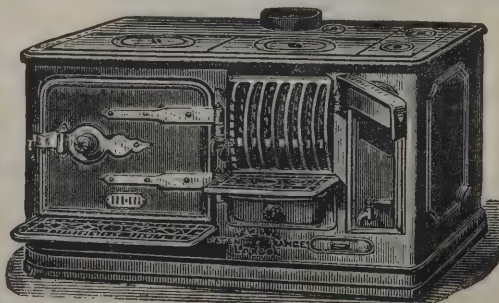
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ELECTRICAL PUMPING PLANT.

AN installation of electrical pumping machinery has just been designed and fixed by Messrs. Easton & Anderson, Limited, 5 Whitehall Place, S.W., and Erith Ironworks, Kent, at the brewery of Messrs. Warwicks & Richardson's, Limited, Newark-on-Trent, which possesses several features of interest. Mr. J. F. Warwick (on behalf of the company), in seeking for an independent supply, found, about a year ago, a source of water suitable for brewery purposes by sinking a well in a field about a mile and an eighth from the brewery, and at the same time conceived the idea of pumping up this water by means of electricity to the tank at the top of the brewery, generating the current at the same place and transmitting it to the pumps by suitable conductors. Accordingly, he placed himself in communication with Messrs. Easton & Anderson, Limited, who undertook to carry out the work, and received the order from the company in September last for doing so. The question at once arose, Should the conductors be overhead or underground? It was manifestly better that they should be underground, as it avoided the use of unsightly poles and wires, which would be more liable to injury, though, of course, more accessible for repairs. The cost of underground cables suitable for the purpose appeared at first sight, however, to put them altogether out of court. There was, however, one circumstance in which this work differed from the ordinary electric transmission plant, and that was that a water-pipe had to be laid to the brewery from the well, and this involved getting out a trench. It occurred to Messrs. Easton & Anderson that if a pair of cables could be laid in the trench at the same time as the pipe, the cost would be very materially reduced, and on going into the matter it was found that while the plan would not be cheaper than posts and naked overhead conductors, it was not very much dearer, so that it was eventually decided to use the underground system. It was thought at one time that the pipe main might have been used for a return instead of a second cable, but the idea was not acted upon. It was considered desirable to be able to automatically vary the speed of the motor by varying that of the engine, and this condition was easily fulfilled by making the dynamo and motor both series wound.

The plant now stands as follows:—The dynamo is of the

"Whitehall" type, having slotted armature and double magnetic circuit, the field magnets being of cast-iron. It is, as before stated, series wound for 360 volts and about 15 amperes at 900 revolutions. It stands on sliding rails and is driven by a link belt from a countershaft, which derives its motion by a belt from a horizontal single-cylinder non-condensing engine, which with the countershaft was already in existence. At present this engine does very little other work, but as it is too large for the pumping it is contemplated to use it for other purposes, and therefore the pulley on the countershaft which drives the dynamo is fitted with friction clutch, which enables the dynamo to be readily started or stopped as required independently of the engine. Suitable fuses and cut-outs are provided in the engine-house, and from them the cable is led to the pumps. An ammeter is also fixed here so that the engine-driver can see that the current is being properly supplied. The cable was made by Messrs. Callender & Co., and is of their armoured type, so that it cannot easily be injured as it lies in the ground. The conductor consists of seven wires, each .054 inch diam., giving a total sectional area of .0155 square inch and a maximum resistance of 2.84 ohms per mile, insulated by means of a solid sheet of vulcanised bitumen, taped and secured with jute yarn, armoured by means of twenty galvanised iron wires, and finished by a braiding of hemp yarn well compounded. It is laid in a special trench for a short distance till it joins the delivery pipe main leading to the tank, and from thence the two go together to the pump-house at a depth of about 2 feet below the surface of the ground. There are only two joints on each of the two cables, and as the workmen laid the pipe they laid the cables, one on each side in the trench, leaving the part to be jointed open till the work was done, when a special man was sent by Messrs. Callender, who made the joints and tested the line. The pipe main consists of 5-inch cast-iron socket and spigot pipe, for the most part jointed in the ordinary way. At one point the pipes have to cross a railway bridge over a canal, and here, in order to occupy as little space as possible, they are of wrought-iron with flange joints, and are made only 4 inches in diameter, carefully enclosed and lagged to keep them from the effects of frost, the cables also being included in the same casing to preserve them from injury. The ground is low and wet, and the pipes and cable in some places pass under ditches, and were then actually laid below the water level. The pump-house is situated a few yards from the well. The outlet from the rising main at the tank is 70 to 80 feet above the surface of the water in the

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well. The pumps are of the ordinary three-throw type of Messrs. Easton & Anderson's standard pattern, with gunmetal valves. The barrels are $5\frac{1}{2}$ inches diameter and 12 inches stroke. The pump crankshaft is driven from a countershaft by means of a cast-iron pinion and wheel; and the motor in its turn drives the countershaft through the medium of a gunmetal pinion and a mortice wheel, the teeth of which are accurately machined to a special shape. The motor is fixed on a concrete foundation in such a way that it is readily accessible on all sides, which is a very desirable thing where space permits. It is of the same type as the dynamo, and is likewise series wound, to run with 260 volts at a speed of 600 revolutions, at which the pumps will make 28 revolutions per minute, and are calculated to deliver 5,000 gallons per hour to the brewery. The bearings of the motor are made self-oiling by having each brass bush made in two lengths with a gap between them, in which an endless pitch chain of brass rests on the spindle and dips into an oil-well beneath the bearing. When the spindle rotates it carries the chain round and brings up a supply of oil, which is deposited on the spindle, and finds its way along the bearings by means of grooves, eventually returning from the outer ends of the bearings to the oil receptacle. Thus the motor may run for weeks or even months without any attention to the lubrication being necessary. The lubricators on the pump are of the ordinary needle type, which last a considerable time without attention. For stopping and starting the motor at the pump-house a suitable switch and resistance frame is provided.

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[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

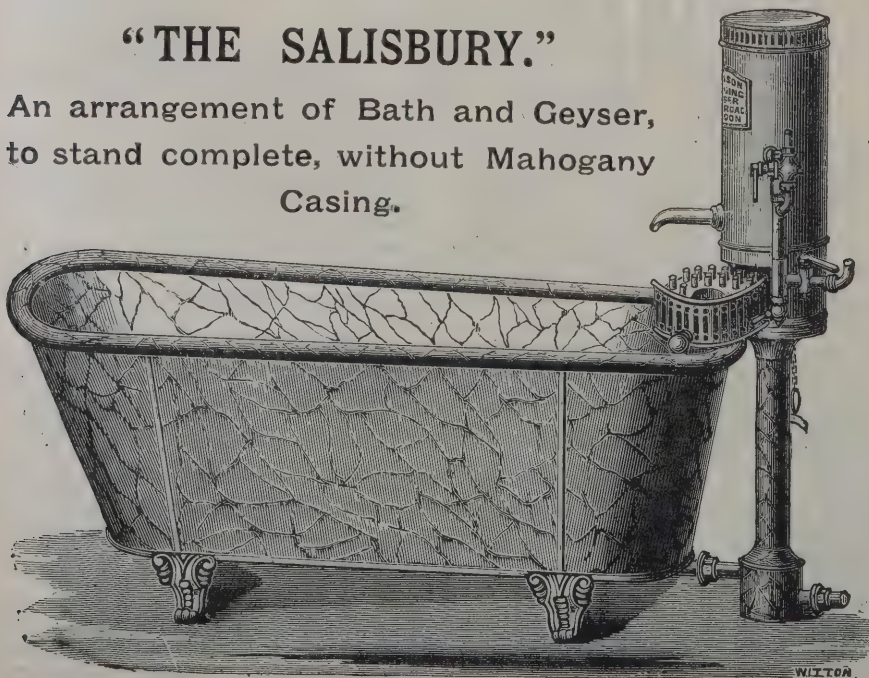
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No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.
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FISKERTON.—May 25.—For Additions to Bromley Arms. Messrs. Sheppard & Harrison, Architects, 17 Kirkgate, Newark.

GRAITREBANOS.—May 19.—For Building Unitarian Chapel. Mr. H. Morgan, Graitrebanos, Pontardawe.

HARROGATE.—May 27.—For Building House. Messrs. H. E. & A. Bown, Architects, James Street, Harrogate.

KENDAL.—June 6.—For Additions to Town Hall. Mr. S. Shaw, Architect, Kendal.

KING'S HEATH.—May 23.—For Building Board School. Mr. E. Holmes, Architect, Cobden Buildings, Corporation Street, Birmingham.

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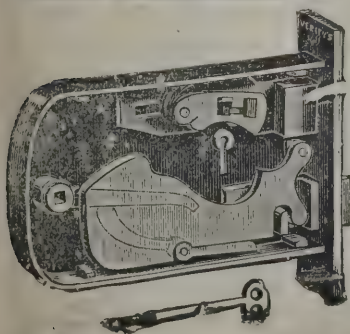
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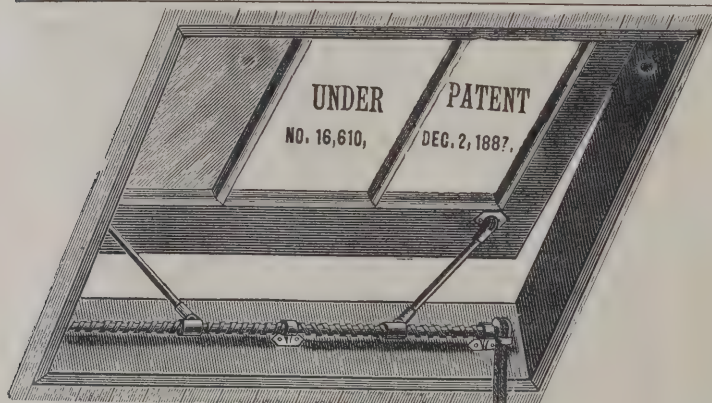
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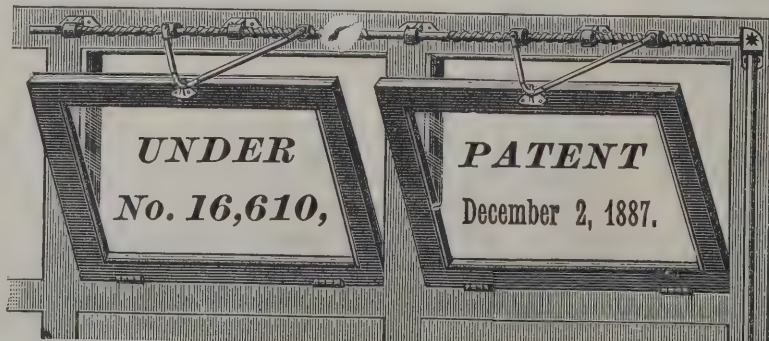
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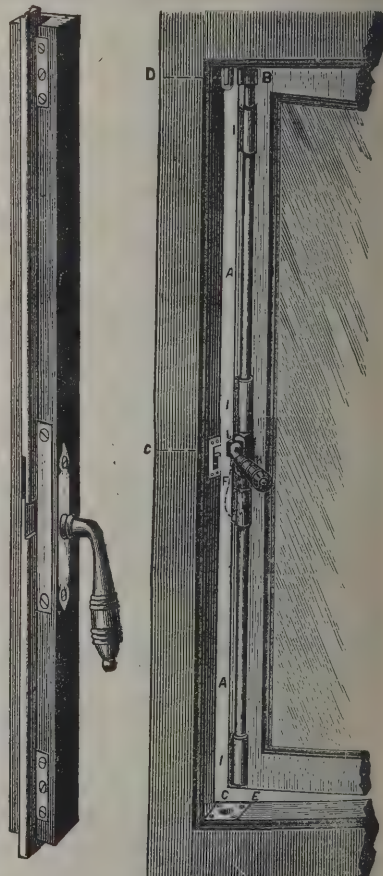
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No. 08.—Special thrust-motion round section Bolt suitable for very narrow tiles. It can be fixed where the space is insufficient for anything else. This Bolt is neat, strong and reliable.

CARDIFF—*continued.*

For Additions to Stacey Road Board Schools, for the Cardiff School Board. Messrs. P. P. BRUTON & WILLIAMS, Architects.

Hatherley & Carr, Bristol	£2,597	0	0
Edw. H. Page, Cardiff	2,560	18	5
Knox & Wells, Cardiff	2,540	0	0
D. J. Davies, Cardiff	2,480	0	0
D. C. Jones & Co., Gloucester	2,389	0	0
Lattey & Co., Cardiff	2,385	0	0
HENRY DAVIES, Cardiff (<i>accepted</i>)	2,237	9	7

For Building Engine-house, Boiler-house and Coal Stores, for the Electric Lighting Station, Canton, Cardiff. Mr. W. HARPUR, Engineer,

Ashley, Cardiff	£4,272	4	4
THOMAS & Co., Cardiff (<i>accepted</i>)	3,328	3	2
Ellis & Davis, Cardiff	3,254	17	7
Ridley & Son, Cardiff	3,234	10	6

DORKING.

For Building House, Rose Hill Estate, St. Paul's Road, Dorking, for Mr. William Attree. Mr. F. J. DIBBLE, Architect, Westfield, Dorking. Quantities by Messrs. BARGMAN & BENISON.

Cole	£1,629	0	0
Putney Bros.	1,480	0	0
Goddard & Son	1,445	0	0
Debenham	1,400	0	0
Canter	1,397	10	0
Colls & Son	1,375	0	0
Hamblin Bros.	1,355	0	0
EDSER (<i>accepted</i>)	1,336	0	0

EDMONTON.

For Additions to Workhouse at Upper Edmonton. Mr. T. E. KNIGHTLEY, Architect. Quantities by Messrs. BATTERBURY & HUXLEY.

F. Voller, Wood Green	£27,498	0	0
F. J. Coxhead, Leytonstone	27,265	0	0
Lawrence & Son, Wharf Road, N.	27,245	0	0
Parnell & Son, Rugby	27,211	0	0
Allen & Sons, Kilburn	26,983	0	0
W. Shurmur, Upper Clapton	26,865	0	0
Treasure & Son, Harringay, N.	26,760	0	0
C. Wall, Chelsea, S.W.	25,909	0	0

CROYDON.

For Alterations at the Fox and Hounds Tavern, London Road, West Croydon. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within, E.C.

Hanscomb & Smith	£1,075	0	0
Waller	1,059	0	0
Toller	1,045	0	0
Todd	1,029	0	0
Edwards & Medway	1,020	0	0
Simpson & Cove	1,012	0	0
Spencer & Co.	997	0	0
COURTNEY & FAIRBAIRN (<i>accepted</i>)	929	0	0

Pewterer, &c.

T. HEATH (<i>accepted</i>)	129	0	0
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Gas-fittings.

J. & C. CHRISTIE (<i>accepted</i>)	100	0	0
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EARLS BARTON.

For Erection of Small Boot and Shoe Factory, Princess Street, Earls Barton, Northampton. Mr. ABRAHAM MOSLEY, Architect and Surveyor, Goodyear Chambers, Abington Square, Northampton.

Bricklayer, Mason and Slater Work.

J. Harris, Earls Barton	£142	0	0
F. JOHNSON & SON, Earls Barton (<i>accepted</i>)	121	0	0

Carpenter Work.

S. Knight, Earls Barton	81	18	11
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Plumber Work.

J. Simede, Earls Barton	13	5	0
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Iron lights, &c., provided free by Proprietor.

FARNBOROUGH.

For Extension of the Convent of Notre Dame du Sacre Cœur, Farnborough, Hants. Mr. JOSEPH STANISLAUS HANSON, F.R.I.B.A., Architect, 27 Alfred Place West, South Kensington. Quantities by Mr. HENRY SMITH, F.S.I., Surveyor, 8 John Street, Adelphi.

Extra for Adamant Plaster.

F. J. Messom, Twickenham	£9,345	0	0	£149	0	0
Oldridge & Sons, Norbiton	8,927	0	0	205	0	0
W. Garland, Aldershot	8,890	0	0	—		
G. Kemp, Aldershot	8,783	0	0	200	0	0
Martin, Wells & Co., Aldershot	8,717	0	0	50	0	0
W. R. & C. Light, Portsmouth	8,447	0	0	112	0	0
CLARIDGE & BLOXHAM, Banbury	8,397	0	0	274	0	0

* Accepted.



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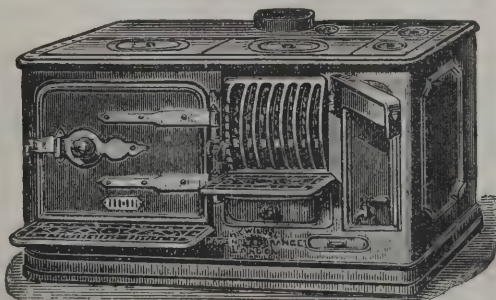
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For Building Seven Dwelling-houses at Flimby.

H. Archer, Dearham	£1,251	5	0
J. Young, Whitehaven	1,222	5	0
J. Coulthard, Workington	970	19	0
J. Scott, Workington	947	16	0
S. MCWHINNEY, Workington (accepted)	884	0	0

GREAT YARMOUTH.

For Building Boys' School for 300 in St. Peter's Road, for the Great Yarmouth School Board. Quantities by the Architects, Messrs. BOTTLE & OLLEY, Great Yarmouth.

J. Rands, Great Yarmouth	£2,739	10	0
Cockerill & Sons, Gorleston	2,617	6	6
T. Howes, Great Yarmouth	2,578	19	0
G. T. Flaxman, Great Yarmouth	2,462	0	0
Cork & Co., Great Yarmouth	2,433	0	0
J. S. Cooper, Great Yarmouth	2,431	0	0
J. Leggett, Great Yarmouth	2,430	0	0
R. Davy, Great Yarmouth	2,358	0	0
R. Eastoe, Great Yarmouth	2,345	0	0
F. Grimble, Great Yarmouth	2,340	0	0
G. W. Beech, Great Yarmouth	2,300	0	0
G. Beckett, Great Yarmouth	2,297	0	0
J. F. W. Bray, Great Yarmouth	2,232	0	0
J. WARD, Great Yarmouth (accepted)	2,216	5	0
Architects' estimate	2,380	0	0

HEYWOOD.

For Building Technical School, Heywood. Messrs. WOODHOUSE & WILLOUGHBY, Architects, King Street, Manchester.

Blakeley, Hopwood & Bell, Heywood	£5,420	0	0
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LESLIE.

For the Work in connection with Formation of Mill Lade at Feitykil Paperworks, Leslie. Mr. WM. D. SANG, Engineer, Kirkcaldy.

D. Wilkie, Kirkcaldy	£1,220	12	0
R. C. Brebner, Edinburgh	1,200	19	0
D. Gilmour, Kirkcaldy	1,134	11	11
A. Brunton & Son, Inverkeithing	1,107	18	2
Henderson & Duncan, Edinburgh	1,090	18	4
J. Shaw, Leith	1,026	18	6
A. GRAY & Co., Kirkcaldy (accepted)	925	10	10

LONDON.

For Alterations to the Queen's Hotel, Paddington, for Mr. T. Scott. Mr. W. A. FINCH, Architect, 76 Finsbury Pavement, E.C.

Beale & Son	£164	15	0
S. Goodall	132	0	0
Sheffield Bros.	122	0	0
B. NIGHTINGALE, Albert Embankment (accepted)	115	0	0

For the Erection of Three Houses in North Grove, Stamford Hill, N., for Mr. J. Bowdon. Mr. W. A. FINCH, Architect, 76 Finsbury Pavement, E.C.

Barrett & Power	£1,770	0	0
A. Porter	1,500	0	0
S. Goodall	1,497	0	0
J. Pappin	1,383	0	0
Thomerson & Son	1,349	0	0
BRUCE & MIDDLETON, Stamford Hill (accepted)	1,200	0	0

For Improving, &c., Drains, at Board School, Magdalen Street, Horselydown.

S. Polden	£238	0	0
Leeks & Hooker	185	0	0
Calnan & Co.	170	0	0
H. Mallett	168	0	0
J. T. Robey	165	0	0
W. & H. Castle	146	10	0

For Building Pupil Teachers' Centre on Site of Temporary Board School, Church Terrace, Plumstead.

J. Longley & Co.	£7,623	0	0
B. E. Nightingale	7,230	0	0
S. & W. Pattinson	7,043	0	0
J. & M. Patrick	6,905	0	0
Holloway Bros.	6,642	0	0
Hart Bros.	6,362	0	0
Kirk & Randall	6,170	0	0

For Converting Building in School House Lane, Broad Street, Ratcliff, for the purposes of a Day Industrial School, for the School Board.

Staines & Sons	£1,387	0	0
Clarke & Bracey	1,350	0	0
Johnson & Co.	1,319	0	0
J. N. Calnan & Co.	1,260	0	0
White & Son	1,215	0	0

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LONDON—continued.

For Providing and Fixing Heating Apparatus on the Low-pressure Hot-water System, with necessary Boilers, for Enlargements of Board Schools, Langford Road, Fulham, and Bell Street, Edgware Road, now in course of Erection, and for Extending the new Apparatus to existing Portions of the Buildings.

Langford Road, Chelsea.

T. Potter & Sons.	£290	0	0
Fraser & Fraser	256	0	0
G. Davis	230	0	0
J. & F. May	215	0	0
W. G. Cannon	167	0	0
J. F. Clarke & Son	167	0	0
Purcell & Nobbs	163	0	0

Bell Street, Marylebone.

Wenham & Waters	552	0	0
Fraser & Fraser	380	0	0
J. Gibb & Son	369	0	0
Z. D. Berry & Sons	366	10	0
Purcell & Nobbs	337	0	0
W. G. Cannon	286	12	0

For Improvements at 21 Highbury New Park. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within, E.C. SIMPSON & COVE (accepted) £141 0 0

For Erection of Fifteen Iron Buildings on Certain Sites, for the Purpose of Providing Manual Training Centres, for the School Board.

Each Building.	Number of Iron Buildings Contractors are Prepared to Supply.
E. F. Blakeley & Co.	£583 0 0 4
T. Cruwys	475 0 0 6
Croggon & Co., Limited	450 0 0 6
John Lysaght, Limited	431 0 0 —
E. Spencer & Co.	427 0 0 10
E. Braby & Co., Limited	413 0 0 1 or more.
Blackwall Galvanised Iron Company, Limited	387 10 0 15
Walter Jones	387 0 0 15
W. Harbrow	368 5 0 15
D. Charteris	360 0 0 15
Humphreys, Limited	356 13 4 15
Isaac Dixon & Co.	336 14 0 15

LONDON—continued.

For Removing the Two temporary Iron Buildings on the Site in Farringdon Road, and Re-erecting in Hackford Road and Stockwell Road, Brixton, for the School Board.

D. Charteris	£416	0	0
T. Cruwys	400	0	0
Croggon & Co., Limited	397	10	0
W. Harbrow	387	15	0

For Internal Fittings at the British Oak Tavern, Stoke Newington. Mr. R. A. LEWCOCK, Architect, 88 Bishopsgate Street Within, E.C.

Contractor and Pewterer.

T. HEATH (accepted)	£1,057	0	0
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Gas-fittings.

W. WINN (accepted)	£184	0	0
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For Improvement Works, for the Hornsey Local Board. Mr. T. DE COURCY MEADE Engineer.

Hornsey Lane, by Linden House Estate.

T. G. Dunmore, Crouch End	£919	0	0
B. Cooke & Co., Battersea	781	0	0
T. ADAMS, Wood Green (accepted)	603	11	11

Tottenham Lane, by Railway Station.

W. Walker, Holloway	220	18	6
B. Cooke & Co., Battersea	198	0	0
T. Adams, Wood Green	160	5	10
T. G. DUNMORE, Crouch End (accepted)	107	0	0

Tottenham Lane, by Fire Station.

B. Cooke & Co., Battersea	99	0	0
T. G. Dunmore, Crouch End	95	0	0
W. Walker, Holloway	94	6	2
T. ADAMS, Wood Green (accepted)	78	3	2

Stapleton Hall Road, between Granville Road and Stroud Green Station.

T. G. Dunmore, Crouch End	196	0	0
W. Walker, Holloway	180	9	0
B. Cooke & Co., Battersea	180	0	0
T. ADAMS, Wood Green (accepted)	176	5	4

Muswell Hill Road, between Churchyard Bottom and Railway Bridge.

T. G. Dunmore, Crouch End	2,203	0	0
B. Cooke & Co., Battersea	1,712	0	0
S. Hudson, Dulwich	1,559	8	9
W. Griffiths, Kingsland	1,518	6	6
T. ADAMS, Wood Green (accepted)	1,417	16	2

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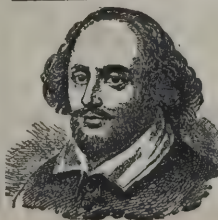
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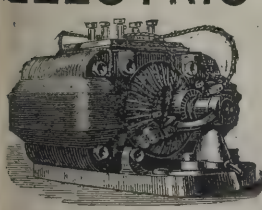
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LONDON—continued.

For Making-up Private Roads, for the Hornsey Local Board.
Mr. T. DE COURCY MEADE, Engineer.

Frobisher Road (Second Section).

B. Cooke & Co., Battersea	£2,678	0	0
W. Griffiths, Kingsland	2,370	12	5
S. Hudson, Dulwich	2,314	4	0
THOMAS ADAMS, Wood Green (accepted)	2,114	0	0

Falkland Road.

B. Cooke & Co., Battersea	3,176	0	0
W. Griffiths, Kingsland	2,844	10	8
S. Hudson, Dulwich	2,779	12	6
THOMAS ADAMS, Wood Green (accepted)	2,499	15	4

Ivy Gardens.

B. Cooke & Co., Battersea	525	0	0
W. Griffiths, Kingsland	449	17	3
THOMAS ADAMS, Wood Green (accepted)	445	17	0

NOTE.—Inderwick Road (1st Section), Warham Road (1st Section), Haringay Passage (3rd and 4th Sections), not yet considered.

For Construction of new Stoneware Sewers on the Stroud Green Estate, for the Hornsey Local Board. Mr. T. DE COURCY MEADE, Engineer.

B. Cooke & Co., Battersea	£1,539	0	0
G. Bell, Tottenham	1,494	10	0
S. Hudson, Dulwich	1,437	0	0
Thomas Adams, Wood Green	1,398	0	0
T. G. Dunmore, Crouch End	1,389	0	0
T. ROWLEY, Tottenham (accepted)	1,057	18	0

Alterations and Additions to 69 Effra Road, Brixton. Mr. WILLIAM HUNT, Architect, 5 York Buildings, Adelphi, W.C.

McLachlan & Sons	£517	0	0
Smith & Sons	493	0	0
G. P. & H. Barnes	487	0	0
Wm. King & Sons	440	0	0

For New Studio and Decorations at 47 Regent's Park Road. Mr. H. HELSDON, Architect.

Macey	£417	0	0
Carr	402	0	0
W. Vanstone	385	0	0
Cawley	345	0	0

LONDON—continued.

For Alterations and Redecorating at 189 New Bond Street, W. W. VANSTONE (accepted) £160 0 0

For Alterations at 8 New Church Court, Strand.] Mr. BANKS, Architect.
W. VANSTONE (accepted) £102 0 0

For Construction of 12-inch, 15-inch, 18-inch and 24-inch Pipe Surface-water Sewers and Works in Connection, Templeton, Tewkesbury and Moreton Roads, for the Tottenham Local Board. Mr. J. E. WORTH, Engineer.

J. L. Cattell, London	£1,298	0	0
T. Adams, Wood Green	1,098	0	0
T. Rowley, Tottenham	1,087	4	6
G. Bell, Tottenham	1,039	0	0
J. Jackson, Enfield	1,030	0	0
J. Bloomfield, Tottenham	989	6	2
A. T. Catley, London	980	0	0
J. Neave, Forest Hill	938	0	0
W. NICHOLLS, Wood Green (accepted)	898	11	4

For Building Infectious Diseases Hospital, Dog Lane, Stonebridge, for the Willesden Local Board.

Lascelles & Co., Bunhill Row	£16,511	0	0
W. Shepherd, Bermondsey New Road	15,808	0	0
Yerbury, Kilburn	15,400	0	0
Lorden & Co., Upper Tooting	15,275	0	0
Cowley & Drake, Willesden Green	14,891	0	0
Lawrence & Son, Wharf Road	14,856	0	0
Carmichael, Wandsworth	14,645	0	0
Scharien & Co., Chelsea	14,510	0	0
Young & Lonsdale, Herne Hill	14,448	0	0
Godson & Son, Kilburn	14,278	0	0
Neave & Neave, St. John's Wood	12,870	0	0

PLYMOUTH.

For Alterations and Additions to No. 48 Richmond Street, for Mr. T. F. White. Mr. JAMES HARVEY, M.S.A., Architect, Bedford Chambers, Plymouth.

C. Kellaway, Plymouth	£234	3	0
Palk & Jillard, Plymouth	213	0	0
A. N. Coles, Plymouth	189	0	0
J. Blackell, Plymouth	171	10	0
PEARNS & SONS, Plymouth (accepted)	150	0	0

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112 lbs. per bushel. Slow setting; test 1,000 lbs. to 14 inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works. Specially adapted for Concrete Floors and Street Paving. "ECLIPSE" PORTLAND CEMENT Quick setting; test, 3 parts. Standard Testing Sand, 280 lbs. per square inch; 28 days. The finest, most plastic, best sand carrying, and cheapest Cement in the market. Specially adapted for laying encaustic tiles, making joints in sanitary pipes, internal stucco, concrete foundations, &c.

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BATH-HEATERS
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"Model Dwelling," Newcastle Exhibition 1887.
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25, 46 and 47 HIGH STREET, NEW OXFORD STREET, W.C.,
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A LIST of ART PLATES published in "THE ARCHITECT" will be forwarded on application to P. A. GIBBERT WOOD, PUBLISHER, 175 STRAND, LONDON, W.C.

PLYMOUTH—continued.

For Cleaning, Painting and Decorating St. Luke's Church, Tavistock Place. Mr. JAMES HARVEY, M.S.A., Architect, Bedford Street, Plymouth.			
G. H. Goss, Plymouth.	£124	18	6
Harris & Sons, Plymouth.	122	10	0
Rundle & Prowse, Plymouth.	120	15	6
HILL & HILL, Plymouth (accepted).	115	0	0

READING.

For Alterations and Additions to the Borough Police Station. Mr. ARTHUR E. COLLINS, Borough Engineer and Surveyor, Town Hall, Reading.			
F. Newbery, Reading.	£276	0	0
T. Pilgrim, Reading.	273	0	0
R. Webber, Reading.	272	10	0
A. Simonds, Reading.	269	0	0
G. H. Tucker, Reading.	258	0	0
W. Hawkins, Reading.	237	12	8
G. Searle, Reading*.	227	17	0
G. Simonds, Reading.	219	0	0

* Recommended for acceptance.

ROTHERHAM.

For Building Board Schools at Ferham, Rotherham.			
Chadwick & Co.	£7,378	0	0
R. Snell.	7,348	0	0
C. GREEN (accepted).	7,200	0	0
Thornton & Son.	7,199	0	0

SWANSEA.

For Building Premises, Swansea, for Messrs. B. Evans & Co., Drapers. Messrs. J. P. JONES & ROWLANDS, Architects, Swansea. Quantities by the Architects.			
Hatherly & Carr, Bristol (time, 21 months).	£22,980	0	0
W. Bowers, Hereford (20 months).	22,600	0	0
T. Watkins & Co., Swansea (24 months).	22,500	0	0
Holway & Parsons, Swansea (8 months).	22,293	0	0
D. C. Jones, Gloucester (15 months).	22,285	0	0
J. Linton, Newport (no time).	22,200	0	0
D. JENKINS, Swansea (12 months) (accepted).	22,100	0	0
J. D. Williams, Knighton (15 months).	22,000	0	0
Stephens, Bastow & Co., Bristol (18 months).	21,789	0	0
Perry & Co., London (9 months).	21,753	0	0
Architects' estimate.	22,000	0	0

TODMORDEN.

For Building Board School at Robinwood, Todmorden. Mr. JESSE HORSFALL, F.R.I.B.A., Architect, Todmorden. Quantities by the Architect.			
<i>Accepted Tenders.</i>			
Thomas Pickles, Luddendenfoot, mason and bricklayer.			
M. Mallison, Todmorden, carpenter and joiner.			
S. Barns, jun., Todmorden, slater.			
R. H. Ingham, Todmorden, plumber.			
Tillotson Blacka, Todmorden, plasterer.			
Total, £2,807.			

WALSALL.

For Building Cemetery Chapel, Entrance Lodge, &c., at Rye-croft, Walsall. Mr. R. H. MIDDLETON, Borough Surveyor, Walsall.			
<i>Chapel.</i>			
R. M. Hughes, Birmingham.	£2,841	0	0
<i>Lodge.</i>			
H. J. Hunter, Willenhall.	570	0	0

WATFORD.

For Building Five Villas at Chalk Hill, New Bushey, for Mr. J. C. Benskin. Mr. W. H. SYME, Architect.			
E. Clifford.	£3,442	0	0
G. & J. Waterman.	3,397	0	0
T. Turner & Co.	3,387	0	0
H. M. Dove & Co.	3,325	0	0
C. Brightman.	3,295	0	0
Andrews & Son.	3,108	0	0

YORK.

For New Rooms in Connection with Centenary Chapel, York. Mr. EDWARD TAYLOR, Architect, 7 Stonegate, York. Quantities by the Architect.			
<i>Schedule of Prices Accepted.</i>			
G. Walker, York, brick.			
T. P. Barry, York, stone.			
H. Young, York, plaster.			
G. Mansfield, York, joiner.			
G. Dodgson, York, slater.			
T. Moyser York, plumber.			
G. Dearlove, York, smith.			
J. Thomas, York, painter.			

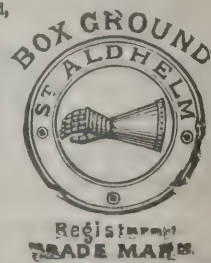
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For Extension, &c., of Cattle Market, Wellington, Salop.	
Mr. ROWLAND MILLINGTON, Architect, Oaken Gates.	
Quantities by Messrs. R. & J. MILLINGTON, Oaken Gates, Salop.	
Bradney & Lloyd, Shifnal, Salop	£1,893 0 0
John Gittins, Shrewsbury	1,790 0 0
GEO. MUIRHEAD, Newport, Salop (accepted)	1,750 0 0
Alfred Roper, Wellington, Salop	1,570 0 0

WREXHAM.

For Building Two Semi-detached Villas, Belgrave Road, Wrexham, for Mr. John Burton, Penygelli Hall. Messrs. J. MORISON & SON, Architects, 10 King Street, Wrexham.	
Rogers, Wrexham	£2,040 0 0
Samuel, Wrexham	1,740 0 0
Owen, Wrexham	1,740 0 0
Davies & Son, Rhosyllen	1,705 0 0
Whittingham, Wrexham	1,683 0 0
BRADSHAW, Wrexham (accepted)	1,660 0 0

BUILDING AND BUILDERS.

THE Plans and Works Committee of the Edinburgh Town Council have approved of plans for the erection of a police and fire station in the Morningside district. The building, which will be situated in Canaan Lane, is estimated to cost about 3,100*l*.

PLANS for new baths at the Pierhead were submitted to the Baths Committee of the Liverpool Corporation at the special meeting. The design shows ample accommodation for the baths, and arrangements for building of six shops on the Pierhead side and a promenade on the side facing the river. It is estimated that the buildings would cost 25,000*l*.

THE Helensburgh Dean of Guild Court has passed plans for a new Liberal club to be erected in Colquhoun Street, adjoining the Union Bank. The building will consist of two storeys, the ground flat containing large billiard-room, caretaker's house, &c., while upstairs there will be a hall capable of accommodating about 200. The hall can be subdivided, and portions set apart for reading-room, recreation-room, &c. There is also a committee-room on this flat. The building will be built of Ballochmyle red stone. The plans have been prepared

by Mr. J. R. Wilson, Helensburgh, and the contracts have been secured by local tradesmen:—Mr. Alexander Miller, mason; Mr. James Ferguson, joiner; Mr. John Horn, plumber; Mr. Allan Armit, plasterer; and Mr. Donal Dempster, slater.

THE *Scotsman* says:—Judging from the number of applications dealt with at the Glasgow Dean of Guild Court, the briskness in the Glasgow building trade is likely to continue for some time. Among the linings granted were:—St. Rollox United Presbyterian Church congregation, to erect a church in Springburn Road; managers of Titwood parish church, to erect buildings in Glencairn Drive, Pollokshields; and Glasgow School Board, to erect buildings in Queen Mary Street, Bridgeton. Altogether there were forty cases before the Court.

THE Partick Dean of Guild Court has granted a lining to the Commissioners of Police to erect new halls, police offices and dwelling-houses in Oswald Street and Park Drive, Whiteinch.

THE Paisley School Board have asked Mr. Thomas L. Watson, architect, Glasgow, to prepare plans for a new school, with accommodation for between 600 and 700 children, to be erected in the playground of the South school, and to consider how the Stevenson Street school can be extended so as to accommodate 200 more scholars.

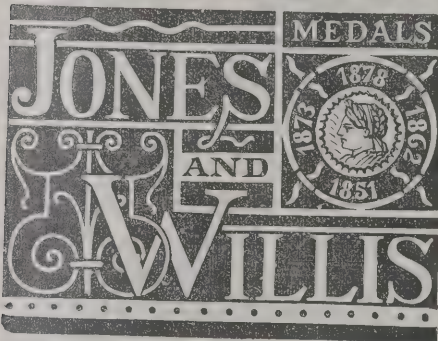
TRADE NOTES.

WE have been requested to announce that Messrs. Horne, Son & Eversfield, the well-known firm of auctioneers and surveyors, of 84 Basinghall Street, E.C., have removed their City offices to 85 Gresham Street, E.C., in consequence of their Basinghall premises being required by the Corporation for the extension of the City of London Court.

THE tender of Messrs. Kinnear, Moodie & Co., builders, Leith, for the construction of a reclamation embankment on the foreshore, and a wet dock, graving-dock and relative works on the east side of the Harbour of Leith, has been accepted by the Leith Dock Commission.

MR. WM. M. HODGES, manager of the Deimel Light Company, Limited, writes to us as follows:—Our attention having been called to the fact that Messrs. Henry Greene & Sons, of Cannon Street, have announced through the press that the action brought by this company against the Vertmarche lamp for alleged infringement of the Deimel Light Company's

MANUFACTURERS OF WROUGHT METAL WORK,



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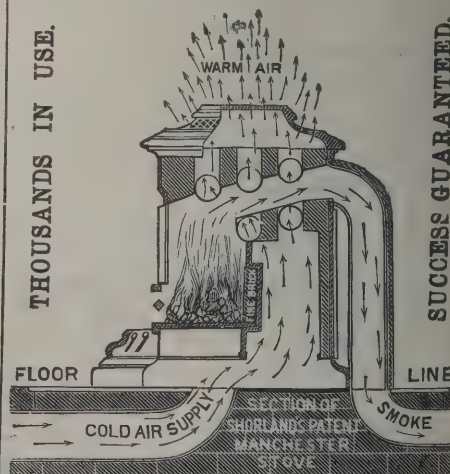
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WARMING AND VENTILATING ENGINEER,
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St. Gabriel's Works, Erskine Street,
MANCHESTER.

Shorland's Inlet and Outlet Ventilators in
every Design.

patents has been dismissed, we beg to inform you that, although through a technical difficulty the original proceedings taken by this company had to be abandoned, a fresh writ was immediately issued and served upon Messrs. Greene & Sons, and the action will be tried in the ordinary course.

AMONG the wonderful inventions, schemes and improvements that our nineteenth century has produced, the one which has augmented our material comfort in the greatest degree is undoubtedly the introduction of improved ventilation and sanitation. The study of the various systems of ventilation and sanitation offers no small attraction to anyone interested in the public welfare, and to architects, surveyors, builders and property-owners it should be of considerable importance. In matters of vital concern it is advisable to obtain information from the highest authorities, and in ventilating and sanitary engineering Messrs. Baird, Thompson & Co., of Queen Victoria Street, London, and Bath Street, Glasgow, certainly deserve that name, having carried away the highest awards in any competition in which they have entered. Their showrooms are at all times open to visitors, and the various systems of ventilation may be seen in operation. Every venture and every undertaking of this firm has proved a decided success, and the extent to which this new system of ventilation is being adopted both at home and in other countries may be gauged by a glance at the vast foreign, colonial and British connection that Messrs. Baird, Thompson & Co. now possess; but to gain an idea of the advantages to be obtained from the application of the system would mean a long study and investigation of every class of building in which the system has been adopted, including ships, theatres, churches, schools, restaurants, warehouses, mills, factories, &c. The ventilation of all emigrant ships should certainly be a Government question, as also the ventilation of all buildings in which labour is employed, for it is not the length of the hours that shortens the lives of the mill and factory hands, but the impure atmosphere they have to inhale during their hours of work.

ON Monday, the 15th, the joiners of Inverness came out on strike. About three months ago a long and tedious strike was brought to a close by the intervention of Sheriff Blair, and only some minor points were left for adjustment. The men, however, insist on the masters agreeing not to import manufactured material, to pay all workmen alike standard wages, and have foremen on the same engaged terms as workmen. To these terms the masters declined to accede, and workmen to the number of 100 struck work.

VARIETIES.

THE Local Board of Elland have engaged Mr. Malcolm Paterson, M.Inst.C.E., of Bradford, to prepare a preliminary scheme for the drainage and sewage treatment of their town, at a fee of 100*l*. Elland being a woollen manufacturing town on the river Calder, the scheme is to make provision for both trade and domestic refuse, a thorough policy now becoming general in the West Riding, as the only practical means of remedying the evils of the universal river pollution of the industrial rivers of that district.

A MOVEMENT is in progress to improve the lighting of the streets in West Calder by adoption of electric light.

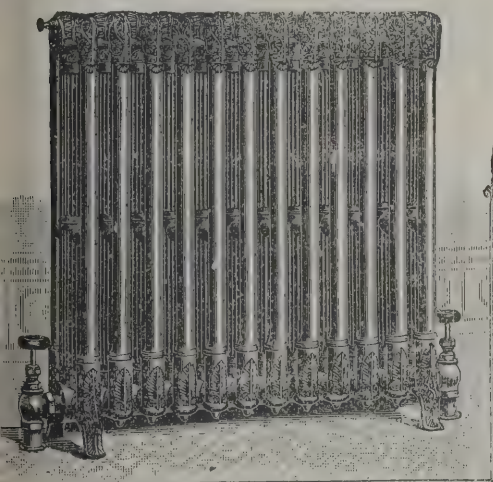
IT is proposed to renovate the interior of St. George's Church, New Mills. Messrs. Preston & Vaughan, architects, Manchester, have been instructed to prepare plans of the work necessary.

IN connection with the "Old Glasgow" exhibition, which is to be held in the Fine Art Institute, Sauchiehall Street, in July, August and September next year, the details of the various sections have been almost completed. The idea of the exhibition originated out of the success which attended the "Old Dundee" exhibition. There are to be seven sections altogether, namely, art, literature, industry, charters, domestic articles, scholastic and ecclesiastical, and distinguished natives and historical events. The history, industrial progress and social life and manners of the city will be fully illustrated in these sections, and a committee, consisting mainly of experts in archaeology, has been organised.

THE Stirling Town Council have decided to reopen communication with the Secretary for War with reference to the condition of Stirling Castle.

IT is stated that Captain Keatinge, of Rhyl, has purchased the Marine Drive Estate, which recently belonged to the National Land Corporation, London, and in consequence of the scarcity of houses will commence building operations immediately. A scheme is also on foot for laying down an electric tramway from Rhyl to Prestatyn.

A MOVEMENT is on foot for the construction of a coach-road through the solitudes of the Sty Head Pass, which, 1,600 feet above sea-level, has hitherto been inaccessible except to people on foot or on horseback. The construction of such a road joining Seathwaite at the north end and Wasdale Head at the south end would give a continuous and uninterrupted coach-road line of communication between Seascale, on the Furness



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Architects should specify for the new Triple-Pipe "UNION," "ROYAL UNION," and "CHAMPION UNION" patterns DIRECT RADIATORS, giving more easy, uniform and positive circulation of Water or Steam; also Walworth's Patent Wrought Tube Steam Radiators.

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Railway on the west, and Keswick, the capital of the Lake district. Mr. G. J. Bell, Cumberland county surveyor and bridge master, has surveyed the district, and it is found that the suggestion is practicable, and, almost all necessary materials being on the spot, could be carried out at a cost of about 5,000/.

THE House of Lords have passed the preamble of the Glasgow and South-Western Railway Bill, for the extension of the passenger and goods stations at Greenock and the improvement of the junction of the City Union and the Glasgow and Paisley Joint Stock Railways at Shields.

THE committee appointed for the erection of a free library and technical school, which Colonel Gamble is presenting to St. Helen's at a cost of 20,000/., have decided to invite competitive designs for the building, the premiums offered being 100/., 50/., and 25/.

THE death is announced of Mr. Valentine Green, who carried on business as land agent and architect at Grantham. Mr. Green was widely known and respected throughout South Lincolnshire, having been associated with the erection of many important buildings in the county. He took an active part in surveying the new railway from Grantham to Melton. He held many important appointments, was one of the diocesan surveyors for Lincolnshire, agent for the Duke of Rutland, architect to Lord Dysart's trustees, and managing director of the Bottesford Gas Company. Mr. Green, who was only forty-two years of age, died from an attack of paralysis.

At the quarterly meeting of the Staffordshire County Council the following motion by Mr. H. T. Hinckes was adopted:—"That the technical instruction committee be authorised to expend the capital sums of 8,500/., and 500/., being part of the surplus of the sums placed at the disposal of the committee by the County Council, for the purposes of the erection of the new Technical Education Buildings at Stafford, and that the common seal be affixed to all necessary contracts in connection therewith when approved by the Clerk of the Council." He said the resolution was necessary to give effect to the intentions of the County Council to put up these buildings at Stafford. After open competition amongst various architects, the committee had approved and accepted the plans sent in by Messrs. Bailey & McConnal, of Walsall, whose estimate was 8,430/. In accepting the plans, the committee insisted on some minor alterations, which the architects agreed to, and that the contract should not exceed 8,000/.. They asked sanction to spend 8,500/., on the building, as it was necessary to allow a margin, and they asked to be allowed to spend 500/., on other fittings,

and hoped the expense would not exceed those two sums. With that amount they would be able to put up buildings which would provide the committee with convenient offices for administrative purposes, a suitable residence for the director, and also rooms for classes of all kinds that might be available for students attending from all parts of the county.

THE *Glasgow Herald*, referring to the Corporation Galleries, says:—"A well known local amateur has just deposited in the galleries on loan for a short time a full-length portrait of William Villiers, Viscount Grandison, nephew of King James VI.'s favourite, the Duke of Buckingham, by the famous Flemish painter, Vandyke. It is a work of remarkable beauty and power—one of the earliest and most carefully-completed of the many portraits of English noblemen painted by the great artist during his brief career in England."

ELECTRIC LIGHTING AT ST. SIDWELL'S, SYDENHAM HILL.

THIS house is fitted throughout with the electric light. The supply company's mains enter the building at the stables, and are carried thence to an eight-way double-pole marble distribution board. These circuits conduct the current along the corridors. Cut-outs corresponding to the number of fittings grouped together and mounted on polished teak blocks are placed above the doorway on the outside of each room. This method is of course adopted so that the fuses can be readily found. We very much approve of this system, as oftentimes cut-outs are fixed in almost inaccessible positions. "Silvertown" wire of an insulation resistance of 600 megohms per statute mile was used throughout, and the whitewood casing received two coats of shellac varnish inside and out as a safeguard against the inevitable moisture in a new house. The hall is lighted by two three-light electroliers, the drawing-room with single-light brackets, the dining-room with a five-light electrolier, library three-light ditto, billiard-room with drop lights. The above and all other rooms are also fitted with portable standards. The work, which is of the very highest class, was carried out by Mr. E. Lancaster Burne, of 22 Tufton Street, Dean's Yard, Westminster, for the owner, Mr. John Paddons; and the fittings, of very beautiful design and workmanship, were supplied by Messrs. Richard Crittall & Co., 20 Baker Street, W., and Messrs. Evered & Co., 27 Drury Lane, W.C. The current is supplied by the Crystal Palace and District Electric Supply Co., Limited.

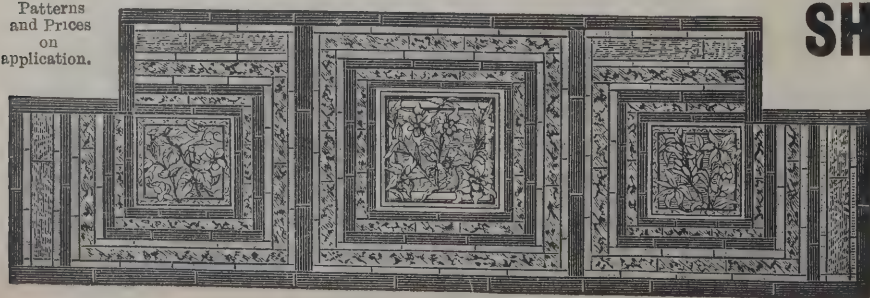
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[T. E. COLLCUTT, ARCHITECT.]

A REFRESHMENT ROOM,
A CONFERENCE ROOM.

* From photographs by Messrs. BEDFORD LEMERE & Co.

HOUSE AT WITMEAD, NEAR FARNHAM,
[RALPH NEVILL, F.S.A., ARCHITECT.]

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The whole of the warming is by steam, and the mains to the various heating-chambers are carried in the subway, where they are fitted with control-cocks to each several section under the immediate supervision of the engineer, enabling him readily to regulate the amount of heat without the necessity of going into the building. The fresh air admission-valves are also worked from the subway, by which the quantity of fresh air which is admitted can also be regulated.

The whole of the corridors and galleries are warmed by steam radiators, provided with fresh air ventilating-tubes through each pipe, and having fresh air admitted to the bases from the outside atmosphere.

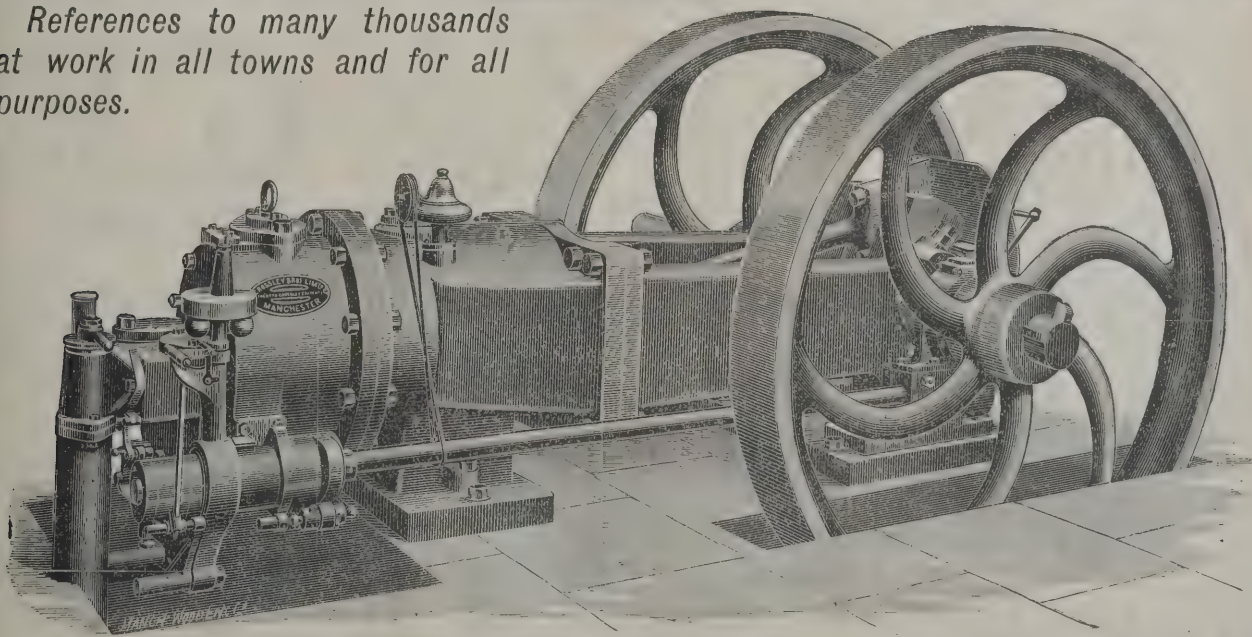
The vitiated air is taken from every room and corridor by means of extraction shafts built in the walls, and fitted in the rooms with self-acting floating valves. The whole of these shafts are connected into four main trunks or ducts in the roof, and are carried to the centre tower, where they discharge into the open air. To facilitate the extraction of this vitiated air a pair of engines with a compressed-air plant and receiver is fixed in the general engine-house, and the compressed air is taken to the roof and coupled up to the main trunks in several places, and the end of the pipes fitted with gun-metal nozzles for inducing a rapid outflow of the atmosphere of the rooms into the outer air and cause a constant renewal of the fresh air passing through the various rooms, warmed in the winter and cooled and moistened in the summer.

The whole of the work was carried out by the old-established firm of Clements, Jeakes & Co., who also carried out the fitting-up of the extensive kitchens, larders, and sculleries, which are situated on the top floor, for the service of the refreshment department.

We are glad to notice the rapidity with which Duroline and Carboline are coming to the front, and replacing glass for roofing purposes. The former of these materials has the transparency of glass, but gives a more subdued and agreeable light—an important consideration in buildings of large dimensions. Carboline is an opaque substance, and is used, of course, for roofing simply, whilst Duroline forms the skylights, &c. These in conjunction have been specified and used for the Grand Hall and Prince of Wales's Smoking Pavilion of the Imperial Institute, and carried out by the New Wire-Wove Roofing Co., Limited, giving the utmost satisfaction. The ease with which these materials are fixed is a strong point in their favour, large sheets being fixed from rafter to rafter, the only care necessary being to stretch them tightly. Then, from the view of cost, Duroline and Carboline come considerably cheaper ultimately. There is less timber work, no putty, no rebating, no breakage, and less heat than with glass, and there is less risk of fire. We notice that the New Wire-Wove Roofing Co., Limited, are busy with Government contracts, consisting of skylights required for Dublin Post Office, Dublin Custom House, new Post Office, Brierley Hill; Kirkee Powder Mill (India), &c. Duroline and Carboline have also been adopted in the Hotels Métropole at London and Brighton, for the stables of the London Road Car Co., Limited, &c. The offices of the New Wire-Wove Roofing Co., Limited, are at 75A Queen Victoria Street, E.C.

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THE GLASGOW 150-TON CRANE.

THE new 150-ton crane on Finnieston Quay, Glasgow, has been officially tested. This important addition to the equipment of the harbour of Glasgow has been rendered necessary, says the *Herald*, by the great increase in the size of marine boilers and engines constructed in the Glasgow district. At the end of October 1889 the Works Committee of the trustees asked Mr. Deas, their engineer, to ascertain the views of the leading local engineering firms on the question of providing on Finnieston Quay an additional large crane or shear-legs, capable of lifting about 150 tons. Towards the end of the year Mr. Deas reported to the committee the result of his inquiry, and recommended that a steam pillar-crane to lift 130 tons, but tested to 150, should be provided. This recommendation was adopted, and on November 28 following Messrs. Cowans, Sheldon & Co., Limited, Carlisle, were entrusted with the work. The construction of the seat, which was carried out by Mr. Deas's staff, was of a most difficult and tedious character. The river-wall having for some years prior to 1885 been moving forward, through the gradual lowering of the bottom of the river by dredging, its strengthening by sheet piles, 12 inches square, was commenced in the autumn of that year, and it therefore became necessary, in order to take full advantage of the sweep of the crane, to project the river-face of the seat to the extent of 5½ feet at the cope level. This necessitated the construction outside of a 9-inch thick sheet pile tongued and grooved coffer-dam to keep the tide out; the taking down of the quay wall for 52 lineal feet; and the driving of sheet piles on the other three sides, to prevent the ground from slipping. But even although an extension had not been necessary, the wall would have been unable to carry the superstructure. There was certainly a substantial structure entirely of ashlar, 14 feet thick at the bottom and 8 feet at the top, but it was inadequately founded at 25 feet below the cope level, on five rows of red pine, bearing piles 11½ inches square by only 16 feet long, and on 6-inch front sheet piling only 14 feet long. As soon as the coffer-dam was completed the quay wall was removed, the timber sills and runners were lifted and the bearing and sheet piles were drawn. When the enclosure had been excavated to 28 feet below the cope level concrete cylinders of 9 feet 7½ inches external and 5 feet 9½ inches internal diameter were sunk. In the front were placed three triple groups, close behind them four single cylinders and at the back three groups of triple. They all rest upon cast-iron shoes,

and the front groups are at an average depth of 32 feet 8 inches, the single cylinders of 31 feet, and the back groups of 28 feet or 60 feet 8 inches, 59 feet and 56½ feet respectively below the level of the quay wall. The tops of the front cylinders are 25 feet below the cope level, and those between and at the rear 22½. All are filled with Portland cement concrete, and on them rests the mason work, which is 40 feet square, and rises to 45 feet above the top of the front cylinders and 20 feet above the level of the quay wall. It consists of concrete rubble hearting faced to the level of the cope of the quay wall on the waterside with granite quoins and the redressed free-stone ashlar of the old wall, and on the other three sides with heavy rubble. From the level of the quay the facing is of granite quoins at the corners, with ashlar concrete in courses, surmounted by a granite cope 3 feet thick and of a minimum breadth at the centre of each side of 7 feet, and at the corners of 14. The total weight of the masonry above the cylinders is 4,300 tons. The crane is probably the largest steam-pillar crane owned by any harbour trust or dock company in the United Kingdom, if not actually in the world. The framing, shafting and jib are of mild steel; the gearing, so far as is necessary, is of cast steel, and the crane revolves on steel live rollers, working on a steel pathway. The centre is a massive casting, weighing 9 tons, and is held down by six steel bolts, each 38 feet 9 inches in length and 5 inches in diameter. These are fixed to six washer-plates, each 6 feet square, which are built at intervals into the seat at a depth of 30 feet. A brick-lined tunnel 2 feet wide by 10 feet 9 inches radius at centre and 6 feet high, with a manhole and a similar approach from one side of the crane-seat gives the access necessary to fix the cottars on the low ends of the bolts. In this centre casting is the steel centre-pin, which is 17 inches in diameter, and weighs 6 tons. The diameter of the roller path is 33 feet and its weight 12 tons. In the live roller ring there are seventy-five cast-steel rollers of a maximum diameter of 14 inches, weighing in all 10½ tons. The framing is 27 feet in height, and weighs 50 tons. The boiler is 14 feet high by 6 feet in diameter, and weighs 6 tons. The jib, which is two tubes, each 3 feet 3 inches in diameter at the centre, is 90 feet long, and weighs, including stays, 45 tons. Its extreme height from the quay level is 110 feet. The centre of the jib-head pulleys for heavy loads, which are 5 feet 3 inches in diameter, is 100 feet; and for light loads, the pulleys for which are 2 feet 6 inches in diameter, 107 feet 6 inches above the level of the cope of the quay wall. The single-tension rods



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are 10 inches by 2½ inches, and the double-tension rods 10 inches by 1½ inches, and the diameter of the pins 8 inches. The whole weighs 8 tons. The diameter of the hoisting drum is 5 feet 2 inches, its length 10 feet, and its weight 10½ tons. The gearing of the crane weighs 8 tons, the castings are in all 120 tons, and the crane, in working order, exclusive of back balance, is 270 tons. In the ballast-box are 100 tons of iron and steel punchings. The crane has two speeds for heavy lifts, 130 and 60 tons, and two for light lifts, 20 and 8 tons respectively. The engine for the heavy lifts has two cylinders, each 12 inches diameter and 16 inches stroke, and the engine for light lifts two, 8 inches diameter and 12 inches stroke. There are two speeds for revolving, and the engine for this purpose has two cylinders, each 8 inches diameter and 12 inches stroke. Plough steel wire ropes, made by the Whitecross Company, Warrington, are used for lifting and lowering, the heavy lifts being taken on eight ropes, 2½ inches diameter, of seven strands—six strands of patent steel round one of soft steel, the outside six giving the strain required. Each strand is composed of eighteen wires, 101 in.—1,346 lb. strain—round 15 wires, 084 in.—983 lb. strain—round 9 wires, 084 in., round 3 wires, 078 in.—803 lb. strain equals 45 wires, and 130 tons strain. The light lifts are taken on a double rope, 1¼ in. diameter, of seven strands, each 37 wires of 060 in. diameter—six of patent steel, and one centre strand of soft steel. The outside strands perform the strain, each wire giving 807 lb. strain equal to 222 wires and 80 tons strain. The gin block for heavy lifts has four pulleys, each 5 ft. 3 in. in diameter, measures 12 ft. by 7 ft. by 3 ft., and weighs about 7 tons. The radius of sweep for the heavy lifts is 65 ft., or 45 ft. beyond the face of the seat, and for the light lifts 69 ft. 9 in., or 49 ft. 9 in. beyond the face of the seat. In a preliminary test made a few days ago, the 60-ton test load was lifted at the rate of 8 ft. 10½ in. per minute, and the 130-ton load at 4 ft. per minute, as against the contracted speeds of 4½ ft. and 2 ft. per minute respectively; while a complete revolution with the former load was made in 2 minutes 17 seconds, and of the latter in 5 minutes, as against the contracted speeds of 3¼ minutes and 6 minutes respectively. The total cost of the crane and seat is under 16,000l. To prevent the possibility of at any time overloading, the crane is provided with a Duckham's 160-ton hydrostatic weighing machine.

At the testing the crane lifted 150 tons of steel rails, and made a complete revolution with the load suspended at about a height of 20 feet.

At the luncheon which followed Mr. Deas, the engineer, in response to the toast of his health, said that sand was admittedly a very unstable material on which to build, but by the use of concrete cylinders which the trustees of upwards of twenty years ago had kindly permitted him to adopt at Plantation and Queen's Dock, a foundation of the firmness of rock was obtained for the crane seat, and the work had been completed and tested without the overstraining of a single bolt or the appearance of a solitary hair-crack in the thousand and more joints of the freestone, concrete, ashlar and granite stones of the outward casing. It was but fair to state that there were at Chatham, Malta, Venice and Spezzia hydraulic cranes capable of lifting 160 tons, but it would be gratifying to the citizens of Glasgow to know that the Clyde Trust possessed the most powerful steam pillar-crane in the world, the largest bucket-dredger and twin-screw hopper barges, and the only elevating-platform steam-ferry for passenger and vehicular cross-river traffic in the universe.

ALSATIAN RESERVOIRS.

ACCORDING to the *Economiste Français*, the construction of mountain reservoirs in Alsace has been in progress during the last ten or twelve years. The work, which at first met with a good deal of opposition from the peasants of the different localities, who looked upon the water which they did not themselves use directly as lost, was carried out by the State. One of the first undertakings was to regulate the two lakes in the valley of Orbey, known as the Black Lake and the White Lake, these two holding 3,000,000 cubic metres of water, so that the cotton and other factories in the valley of Orbey are now able to work all the year round, and there is a constant irrigation of the pastures. The total cost did not exceed 3,000l., and the annual expenditure is only about 160l. A second reservoir was constructed near Sewen, in the valley of Masseraux, not far from the celebrated mountain pass known as the Ballon d'Alsace. This reservoir, surrounded by a wall nearly 90 feet high, contains 1,100,000 cubic metres of water, and is considered such a fine piece of work that a relief plan of it has been sent to the Chicago Exhibition. In 1890 a reservoir was built at Allenweier, in order to regulate the waters of the Fecht, a torrent which has at various times done great damage; and this reservoir, together with three small lakes, also in the valley of Munster, holds about 2,000,000 cubic metres. The

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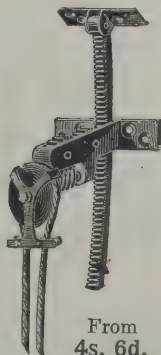
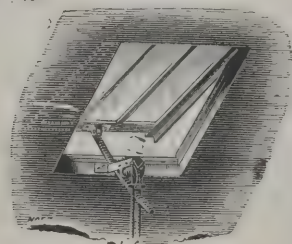
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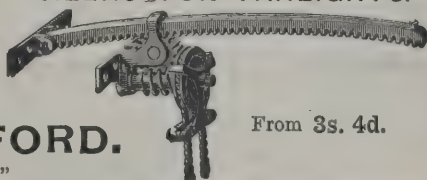
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latest work, commenced last year, was the transformation of the Lauch, in the valley of Guebwiller, into an artificial lake large enough to hold the rain-water which comes down from the surrounding heights and to store it until it is required. This reservoir will have an area of 28 acres and will hold 800,000 cubic metres of water, and, as it is fed by rain-water from a surface of over 1,200 acres, as much as $3\frac{1}{2}$ millions of cubic metres will be collected in the course of the year—that is, when there is an average rainfall. The cost of construction is estimated at 43,250*l.*, of which all but 6,000*l.*, contributed by the town of Guebwiller and the factory-owners of the valley, is found by the State. The reservoir will be finished next year, and will provide motive power for thirty factories and irrigate 4,000 acres of pasture.

PRESSED BRICKS IN CANADA.

NOT more than five or six years have elapsed, says *The Canadian Architect*, since the manufacture of pressed bricks was commenced in Canada. In that brief period, however, the manufacturing firms have multiplied from one to half a dozen, and the process has been perfected to a wonderful degree. In point of hardness, closeness of grain and perfection of form, the pressed bricks at present being manufactured in Canada will compare favourably with those in use anywhere on the Continent or abroad. They are also being produced in a pleasing variety of colour. In view of the success which has been achieved by the manufacturers, it is with much regret that we have observed the otherwise excellent effects obtained by the use of this material well-nigh destroyed in the case of some important buildings recently erected, by the efflorescence of lime-like exudation which, working its way through the pores of the bricks, forms a deposit on the surface. So detrimental is this to the appearance of the building, that unless means can be found to avoid it architects will no doubt feel compelled to cast about for some other material. We learn that the possibility exists of determining in advance of their use whether or not bricks will effloresce, and at the royal testing station of building material at Berlin the test has been applied. The process is described as follows:—The bricks are gradually heated to the boiling point in a waterbath, and are then suddenly immersed in cold water. They are boiled for one hour in a 16 per cent. solution of common salt and frequently cooled as before. They are again boiled half an hour in 5 per cent. soda lye. They are

further boiled half an hour in the same solution with the addition of 1 per cent. of ammonium sulphate. They are then boiled half an hour in a solution containing 2 per cent. blue vitriol and 10 per cent. common salt. Fragments of the brick are placed for seventy-five hours in 3 per cent. hydrochloric acid and for fifty hours more in 5 per cent. hydrochloric acid. By further treatment of the fragments with pure 4 per cent. hydrochloric acid a fluid clear as water is formed which, when treated with barium salts, should not show the presence of sulphates which are the cause of efflorescence. These tests determine the quality of the brick as well, and none which fail to stand the test should be allowed to enter into the construction of a building. We hope that the manufacturers of pressed brick will see the advisability of endeavouring to overcome the objectionable feature of their material to which we have referred.

MANX HARBOURS.

THE committee of the Tynwald Court appointed to consider the scheme of harbour extension in the Isle of Man met at Douglas recently under the presidency of Governor Walpole. Evidence was taken with regard to the proposed bridge across Douglas Harbour, to be erected at an estimated cost of 10,000*l.* The scheme which met with most favour was that for the construction of a bridge at the Royal Hotel corner, in communication with Douglas Head. It was pointed out that this would be a great convenience to visitors, who have now to cross by ferries, would increase traffic and in time pay for itself. On the other hand, it was contended that a bridge in such a position would inconvenience shipping in the harbour, would have to be swung to allow the passage of vessels, and would interfere with berthing accommodation. Evidence was given in favour of a bridge higher up the harbour. It had been suggested that a toll should be levied on passengers to pay expenses, but several witnesses spoke against this and thought the bridge should be free. Evidence was also taken with regard to the proposed extension of the breakwater at Laxey by 50 feet, at a cost of 3,000*l.*, in order to improve the landing accommodation and afford shelter to shipping. At present passengers had to be landed in small boats from steamers at great inconvenience and risk. Some of the witnesses said a 50-foot extension was not sufficient, and that the breakwater should be lengthened at least 100 feet.

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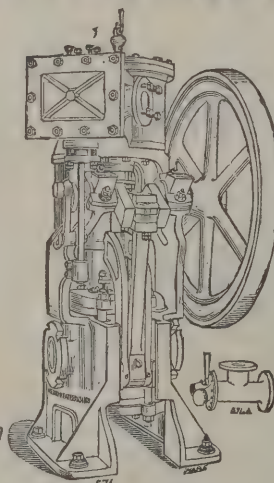
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THE AUCTIONEERS' INSTITUTE.

THE annual dinner of the Auctioneers' Institute of the United Kingdom (Incorporated) was held on Friday evening at the Inns of Court Hotel, Holborn. Mr. George Brinsley, the president, took the chair, and among those present were Mr. James Catling, Mr. Edward Dodson, Mr. Frank Everill, Mr. George J. Healey, Mr. William Weatherhead, Mr. E. W. Richardson, the Mayors of Chatham and Bangor, Mr. T. Martin (president of the Western Counties Auctioneers' Association), Mr. W. Howgrave (secretary of the Institute of Chartered Accountants), Mr. Bridgman, C.C., and the secretary, Mr. Charles Harris. The toast of the evening, "The Auctioneers' Institute of the United Kingdom," was proposed by Mr. Everill. The chief objects of the association, he said, were to provide a central organisation for auctioneers, estate agents and valuers, and generally to do all such things as from time to time might be necessary to elevate the status and promote the interests of the profession. The Institute also sought to provide for the better definition and protection of the profession by a system of examination and certificates of the results of examinations, without, however, granting, or professing to grant, titles or diplomas. Begun in 1886, it received its charter of incorporation in 1889, and during the last three years the number of its members and the amount of its income had largely increased. All care was taken that its members should be only men of professional reputation and personal character. The system of examination was a step in the right direction, and in years to come would be recognised as the hall-mark of the profession, as in the case of surveyors, civil engineers and accountants. A syllabus for examination was now under consideration, and scholarships would doubtless follow. Lectures of great practical interest had already been started. The Chairman, in acknowledging the toast, said that a good deal of jealousy had been excited by the progress of the Institute, which, however, had no reason for fear. The law ought not to allow a man to obtain an auctioneer's license for 10/. Auctioneers had arduous duties to perform, as in valuations, and for such duties they ought to be sufficiently qualified. Other toasts followed. In the course of the evening it was mentioned

that at a meeting of the Institute in the afternoon a motion in favour of raising in future the qualification for admission from two years to five years was adopted.

A SUSSEX AUCTIONEER.


By the death of Mr. Edward Drawbridge, which occurred at his residence at Scaynes Hill on Friday evening, says the *Sussex Daily News*, Sussex has lost its oldest auctioneer and one of the best known men in its rural districts, one whose years and personal characteristics made him a thorough representative of a bygone period of Sussex life. An auction sale is more than an ordinary event in the average monotony of an agricultural district, and as the central figure on hundreds of such occasions the late Mr. Drawbridge became known to thousands of Sussex folk, as well as to the people of the home counties. With the older generations of the present day Mr. Drawbridge was known as one of the most popular men in his class of business. He possessed a rare fund of humour and quaint old-fashioned sayings, and people would flock to his sales to hear his jocular remarks and enjoy his fun; but, to paraphrase a well-known quotation, "Many who came to laugh remained to buy," Mr. Drawbridge fully believing, as a method of business, in keeping his company in a good humour. When in his prime he was the leading agricultural auctioneer of the county. Younger men have known him as the senior partner of a most successful and respected firm, and regarded him as a living representative of the good old times. Some men change with the age, but in manners, mode of living and style of dress Mr. Drawbridge did not change. Jogging along the rural roads in his dogcart, with clean-shaven face, high hat set well back and white-spotted blue cravat, a truer model of the style of fifty or sixty years ago could not be met with even in rural Sussex.

Mr. Drawbridge was the son of Mr. William Drawbridge, auctioneer, valuer and shopkeeper, of Scaynes Hill. He was born on February 28, 1808, at Scaynes Hill, at the house still serving as the village grocery stores, then occupied by the late Mr. William Drawbridge, who afterwards built the house near the main road, on the summit of the hill, in which, after eighty-five years' activity, Mr. Edward Drawbridge died. He was last out on business on March 18, when he looked over some property at Chailey, about seven weeks before he died, showing his aptitude for business almost to the last. Mr. Drawbridge first went out into the business world as a shopkeeper's assis-

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WORKS: BIRMINGHAM.

tant, being apprenticed to a Ringmer shopkeeper, a Mr. Martin, afterwards going to Rodmell in a similar situation. For a short time he was in partnership with "Lawyer Burt," at the East Grinstead Brewery, but between fifty and sixty years ago he returned home, and joined his father in his business, the firm being then known as Messrs. Drawbridge & Son. Mr. William Drawbridge died about forty years ago, and his son carried on the business with great success in his own name until 1884, when Mr. Ansell, who had been associated with Mr. Drawbridge in the business since 1877, entered the firm as a most active partner. Through the great age of Mr. Drawbridge the direction of the extensive business of the firm gradually settled upon Mr. Ansell, and during the past two years the younger partner has practically borne the whole responsibility. The business now devolves entirely on Mr. Ansell, who will carry it on as hitherto.

It is impossible to speak too highly of the late Mr. Drawbridge as a business man. He was straightforward and full of integrity and ability. Mr. Drawbridge had business relations with the late Viscount Hampden, with Lord Sheffield, Sir George Prescott, Sir William Grantham, and other county noblemen and gentlemen, while his name was a household word with the farmers. He was in Sheffield Park at the rejoicings on the occasion of the celebration of the marriage of the present Lord Sheffield's father, and also took a prominent part in the coursing meetings which used to be held in Sheffield Park thirty or more years ago. In the "fifties" Mr. Drawbridge looked after the estate of Mr. Morgan Treherne, of Isenhurst, Mayfield—father of the well known Mrs. Weldon—who was then a prominent Sussex gentleman. On the coming-of-age of Mr. Treherne's eldest son the rejoicings were on a very large scale, two barons of beef being roasted to feast the rural folk. The occasion is still referred to by the people, now old, who participated and who remember Mr. Drawbridge acting as carver of one of the ponderous "barons." As an auctioneer he became noted for having obtained 84*l.* an acre for the produce of some larch plantations, such a price being then unheard of, and he finally valued and sold the estate for Mr. Morgan Treherne for 50,000*l.* So pleased was he with the result that Mr. Treherne gave Mr. Drawbridge a present of 1,000*l.* for this transaction. Many other instances could be given of his success in the particular line he pursued.

Mr. Drawbridge, as previously intimated, adhered to the old-fashioned mode of life. His house and office at Scaynes Hill were typical of the homely ease and comfort of rural

Sussex, and most rustically situated for business premises. He was deeply attached to old customs and habits. He loved good cider—always brewing his own—and favoured the long "churchwarden" pipes, although he had no desire to enter into parochial business. He welcomed his visitors with cordial hospitality, old-fashioned grace and urbanity. He adhered rigidly to his one style of dress, and his neckerchief would always be of blue silk with white spots, of a pattern omitted from present-day fashion books, and having to be obtained for him from a special manufactory in Ireland. In his younger days he was a famous "whip." He drove horses that no one else could manage, and was the hero of innumerable spills and accidents, seeming to have a charmed life. His favourite mode of driving was tandem. Mr. Drawbridge lived the very free life that was common in the old days, when among the country squires and farmers money seemed to both lightly come and go. The rural yarns and more or less authentic anecdotes concerning "Old Ned Drawbridge" would fill a volume. A few incidents might perhaps be mentioned to show the character of his escapades. His "old black mare" became as well known as himself. She was bought of Sir Alexander Cockburn—afterwards Lord Chief Justice—then of Wakehurst, Ardingly, who found it required two pairs of reins to hold her in with the assistance of a groom, and it was two or three years before even Mr. Drawbridge could drive her. This he accomplished more by speaking to the mare than by using the reins. He drove home after a sale once from Hastings to Scaynes Hill, about forty-seven miles, remarking at the finish that he thought "he had given his old mare a twister." A much-talked-of incident was his driving through Offham pay gate. He was driving his father at the time, and the horse bolted. Finding he could not pull her up at the closed gate, he whipped the animal and dashed at the obstruction, smashing it in two, and getting through. He remarked to his father, "That's the way to save the toll," but the reply he got was, "That's all very well, but I'll thank you never to try that experiment with me again, Ned." He drove so fast and fearlessly that people were afraid to ride with him, and nothing pleased him better than to get a nervous passenger by his side in his cart. He would drive over rough common, into ditch, hedge or bank, and frighten the wits out of his companion, or perhaps tear madly along the roads several miles away from where the man wished to go. One man who unwittingly accepted his offer of a ride remarked that he had never been overturned in his life. "Oh! that's easily managed," said Mr.



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WORKS, ROTHERHAM. Estab. 1854.

Drawbridge, and driving over a heap of flints, both he and his friend were soon sprawling across the highway. In one of his runaway episodes Mr. Drawbridge knocked over the pump on Newick Green, which has not been erected since. He broke his collar-bone in that spill. One dark and stormy night he drove up to the well-known inn, the Five Bells at Chailey, his old sale manager, Mr. James Brooker, being in the cart with him. He drove so close to the house that his mare's head and the rods of the cart went through the windows. He backed out, and said, "Well, Brooker, I don't think we'll stop now; they won't know who it was," and drove home. Next day, however, he found the people at the inn well knew who it was that tried to drive into the house itself. It is also related that after a market day at Hayward's Heath—in the early hours of the morning—he drove away with a spirited tandem, and after a time pulled up again at the hotel, remarking, "Well, we've got home safe after all. They will be a bit surprised at the Heath when they hear of it." He had been driving round and round in the dark, and instead of being at home was at the point from which he started. It was some time before he heard the last of this adventure. He was fond of practical joking, and often found the joke against himself. Mr. Drawbridge did not marry until 1867, after a courtship of thirty years, his wife dying without family seven years ago. He had a brother, who died in Australia, and three sisters, who also predeceased him, two having reached advanced ages. Mr. Drawbridge was the last surviving member of his family.

LORD GRIMTHORPE'S WORKS AT ST. ALBANS CATHEDRAL.

AFTER many years the restoration works at the grand old Abbey of St. Albans are approaching completion, and whatever may be the opinions held as to the style of architecture which has found favour in the eyes of the restorer, all will admire, says the *Herts and St. Albans Times*, the munificent generosity of Lord Grimthorpe, who during the past thirteen or fourteen years has expended the enormous sum of over 120,000*l.* in repairing and restoring a famous edifice which had through the erosions of time fallen into general decay. It is only here and there that one meets with those who are the possessors of such vast wealth as would enable them to spend a princely fortune for the benefit of the community, and still more rare is it to come

in contact with those who are willing to thus lavishly spend of their substance. It is perhaps scarcely necessary for us to remind our readers that in the seven years previous to 1880 about 40,000*l.*, subscribed by private individuals, was expended on restoration works at the Abbey, but it was then found that although a commencement had only as it were been made, the money came in so slowly as to preclude the hope that the necessary sum to carry out the extensive restorations required would be forthcoming. Sir Gilbert Scott, the late eminent architect, was the directing mind up to 1878, and shortly afterwards the subject of what kind of roof should be placed on the nave was discussed, and a "battle royal" took place between the supporters of the flat roof and the advocates of the pitched roof. In public gatherings and through the press the fight raged for a considerable time, but at length the adherents of the pitched roof, headed by Lord Grimthorpe, carried their point, and not long had elapsed ere his lordship, at a time when funds were scarce and the Restoration Committee were partially at a standstill, made application for and was granted a faculty covering the whole fabric of the edifice.

Taking upon himself the weighty responsibility of restoring the building, Lord Grimthorpe, then Sir Edmund Becket, first directed his attention to the west front, and from his own plans and under his close personal superintendence, the massive and imposing west end was built up, the apex stone of the great cross being duly placed in position by his lordship on July 25, 1883. The bitter controversy which was carried on in the press with regard to the style of architecture which Lord Grimthorpe had chosen will be remembered, and eminent as were the writers who entered the lists, the trenchant, incisive and caustic replies of the restorer practically left him in undisputed possession of the field, but the protests raised, though for a time silenced, ever and anon are again heard, and many architects of eminence still talk of the "vandalism and iconoclasm which has been brought to the greatest perfection at the St. Albans Abbey." The evident indifference of his lordship to the oftentimes unreasonable criticisms on his restoration work quelled for a period the storm which had been raised, but meanwhile the restoration of the nave still went on, and in October 1885 it was reopened for Divine Service, after having been in the hands of the restorer for eight years. The whole of the work in this part of the church has been carried out in the most substantial manner, and there is every reason to suppose that the fabric will stand secure for many centuries to come. In an account of the restoration work his lordship states:—

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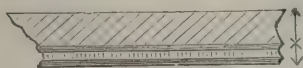


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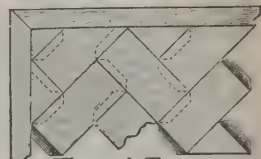
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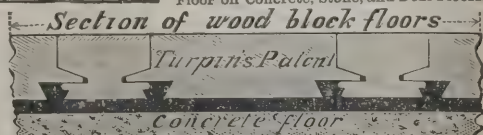
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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"Where there was originally a wall of 9 inches thick, the thickness has been increased to 9 feet." The five bays at the south-west end of the nave were found to be in a very shaky condition. These were made good and the piers repaired, and attention was then directed to the north and south aisles of the nave, over which high-pitched roofs were erected. Near the great western entrances a flight of five steps has been placed, and the whole of the nave has been refloored with York stone, with marble slabs at intervals. On the western side of the rood screen, generally known by the name of St. Cuthbert's Screen, a new communion table has been placed, and the sacristy space has been enclosed with new dwarf walls. The screen has been extended across the north aisle, the stonework being wrought in the same character of architecture as the central portion. A doorway in this, behind the font, leads to the vestry, and also communicates with the exterior of the edifice. The southern extension of the screen is of carved oak. A new stone pulpit, of cylindrical shape and very massive in construction, has been erected near the fourth pier from the screen on the north side. Substantial choir stalls and a bishop's throne or chair have been introduced for use at the services. Seating accommodation has been provided in the nave for about 1,600, all the seats being free except the upper row of stalls, which is allotted to church officials, and the front pew on the south side, which is reserved for members of the Corporation. The organ has had added to it a new front of metal pipes on the west side, and the instrument can thus be used for services held in the nave, but many are strongly of opinion that it was a great mistake not to divide the organ, and thus admit of an uninterrupted view of the entire length of the building. Passing into the transepts, those who remember their appearance previous to the restoration are immediately struck with the great alterations which have been made. The great north and south windows were formerly of Perpendicular style, but these have both been destroyed, and windows designed by Lord Grimthorpe have been erected in their stead. These alterations proved to be a fruitful source of controversy, and once again was the battle waged with a fierceness and bitterness which ought not to have been imported into a discussion on the merits or demerits of details of restoration work. A circular window, 29 feet in diameter, of the wheel design and of a very massive character, has been inserted in the north front, and beneath it runs a gallery which gives access to a bell turret. The south window now consists of five long lancet lights which, when

viewed from the interior, appear to rise to an equal height, false heads being used to produce that illusion. Viewed exteriorly, however, it is then seen that the lancets really rise into the gable, the centre one being prolonged to the greatest height. These lancets have been called the "Five Sisters," and remind one of a somewhat similar window in York Minster, from which the design is said to have been taken. The central light is 60 feet high, and is therefore the tallest in England.

The old slype, a damp and gloomy chamber, which formerly stood at the end of the south transept, has been rebuilt at a higher level, and is now used as a porch by which entrance can be gained to the church. Into the south wall of this are built some interesting relics in the shape of carved stonework of different dates found in various parts of the church. The doorway leading from the transept to the porch is enriched on its internal side by some fine Norman tracery; this doorway originally led into the cloister from the west face of the north transept. Much of the work had perished, and has been replaced by modern work, but copied so carefully from the original Norman carving that it is difficult to distinguish which is old and which is new. The arcade of Transition Norman work under the great south window also came from the slype. Externally the church has undergone considerable change. High-pitched roofs have been put on the transepts, presbytery and nave, and the new transept-fronts give quite a different appearance to the building. The unique cylindrical Norman turrets which once adorned the western angles have given place to the present quadrangular erections, and at the eastern end massive buttresses have been built up and other work carried out.

The lady chapel, which dates from the reign of Edward II., is a rectangular building of fine proportions, and is 56 feet long and 23 feet wide. It is approached from the ante-chapel, and has at the south-east end the Chapel of the Transfiguration, which will be used as a vestry. The ante-chapel, which is 41 feet long and 77 feet wide, is divided into three aisles, the centre one being rather wider than the lady chapel, and it is intended to use this for a chapter-house, diocesan conferences, &c. Speaking generally of the interior restoration works of the lady chapel, they are of such a character as will commend themselves to those who examine them with an unprejudiced mind, and Lord Grimthorpe is deserving of great praise for the careful manner in which he has used the enormous power he possesses over the building. At the west end, where the old passage passed through the building, there is now a

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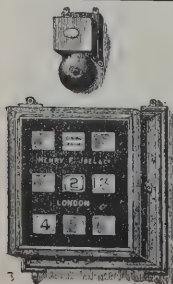
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GOLD MEDAL, Inventions Exhibition, 1885.

sedilia of eleven seats, the centre one being for the highest official dignitary of the church, and on the back of the arch the word "Præsul" is boldly inscribed. The arcading is cut up into five portions of varied design, with delicately carved capitals, cusps, crockets, finials, &c. The old ceiling has been removed and a new one substituted rather plainer in character. In the south aisle a new oak ceiling has taken the place of the old one, and a marble floor is to be put down. Splendidly-carved pierced oak glazed screens cut off the ante-chapel from the presbytery aisles. The old piscina in the south wall of the ante-chapel has a new panel carved in stone, the subject being the vine and birds, and the work has been most delicately carried out. The shrine of St. Amphibalus, which formerly stood in the centre of the ante-chapel, has been removed to the north presbytery aisle, where it has been placed on a new stone plinth, and it is probable that the shrine will find a permanent resting-place here. Viewed from the ante-chapel, the lady chapel now presents a grand and striking appearance. At the western end there is an arch with piers flanked by the old carved niches, with cusped circles above and an inscription on either side, that on the north being

*Sedices anni centum pæne isse feruntur,
Post primæ Albani moenia jacta domus;*

and the inscription on the south is

*Quinquaginta annis et sex Victoria rexit,
Cum domus hæc superat quod fuit ante decus.*

Round the chapel is an elaborately designed arcade on the line of the old work. Starting from a stone seating are moulded bases with triple engaged shafts and beautifully carved capitals, above which are deeply moulded cinquefoil arches, the label mouldings terminating in carved bosses. The spandrels are plain, and there is a moulded string-course running along the top. The east end is more ornate than the north and south sides. The cusp points of the arches are carved, and the string-course is magnificently treated, the carved work, based on naturalistic forms, showing nearly thirty examples of flora. The ancient aumbreys have been retained, and other ancient work has been very carefully dealt with, the object in view having evidently been to restore and not destroy. On the south side of the sanctuary, which is raised by two steps of Derbyshire marble, is the old sedilia, which has septfoil arches, carved label bosses and very delicately-carved cusps. The whole of the carving in stone will well repay close examination, as it is of a most pleasing and varied character, and

it has been based on natural objects. Among the subjects treated are oak, ivy, thorns, filberts, maple, bryony, roses, lilies, pomegranates, figs, sycamore, wheat, vines, passion-flowers, olives, poppies, cherries, strawberries, apples, pears, oranges, lemons, currants, gooseberries, plums, tomatoes, orchids, dog-wood, ash, elm, birch, cedar, pine, pansies, azaleas, maize, walnut, holly, hops, chestnuts, arum lilies, lilies of the valley, marsh mallow, mistletoe, &c., and the remarkable fidelity to nature which the carver has observed is not the least pleasing feature of work which will elicit the admiration of all who examine it. Altogether there are examples of about seventy different specimens of carving in fruit and flowers delineated in the style of the Early Decorated or fourteenth century. Above the sedilia the old canopied niches have been restored where required. The old windows, the design of which has been so frequently admired, have not been interfered with. It will be remembered that they were restored some ten or twelve years ago, when they were reglazed, and in some cases stained-glass was inserted. On the sides above the arcading are splendidly carved corbels on the lines of those at Exeter, and from these spring the ribs of the new groined ceiling of clunch stone, which has replaced the old wooden one. The effect of the roofing is grand, especially when compared with the old one patched with lath and plaster. There are longitudinal, transverse, diagonal and intermediate ribs, with boldly carved bosses at the intersections. The old Jacobean altar-table has been repaired, and will again be used; the altar rail is of oak with iron standards. The floor of the lady chapel, which is now being put down, will consist of marble in 14-inch squares, principally in the form of crosses in black and white, with rouge royal fillings. Over 3,000 slabs will be used, the weight of which is about 40 tons.

The floor of the saints' chapel has been repaved with Yorkshire stone, with slabs of Derbyshire marble at intervals, the pattern being the same as that in the nave. In the south presbytery aisle the old tomb which formerly stood on the south side has been removed to the north side, and now occupies a position adjacent to Duke Humphrey's shrine. The old doorway has been reconstructed, and is now placed in the centre bay, it having previously occupied a position nearer the west end. The arms of the see fill the spandrel on one side and the coat of arms with the crest of Lord Grimthorpe the other. The arcade on the south side of the aisle, which was begun some nineteen years ago under the direction of Sir Gilbert Scott, has been finished out in a most skilful manner, the

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subjects of the carved capitals being primroses, maple, vine, thorn and filbert; and the bases of the columns in the north presbytery aisle have also been repaired. Many of the fragments of old work which have been collected during the progress of the work have been erected on the east wall of the saints' chapel, and will be studied with great interest. Exteriorly the windows of the presbytery have been restored and reglazed. New parapets have been erected, the flint work has been repointed, and at the east end turrets with finials replace the old Norman turrets. The east window of the presbytery has been filled in with stained-glass given by Mr. Toulmin many years ago, but which previously had not been used. The exterior roofs of the presbytery and lady chapel are new and have been covered with lead in a most substantial manner, and supporters of the flat roof will be glad to hear that the pitch of the lady chapel roof is very low. The massive wall of the small churchyard on the south side has been removed and light iron railings have been erected, thus enabling a much better view to be obtained of the fabric. The old yew tree has also been removed and other detail work carried out, everything it is scarcely necessary to say having been done entirely regardless of cost, and so far as the eastern part of the cathedral is concerned there has evidently been an honest attempt to preserve what was really worth preserving, and to restore only where restoration was required.

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NATIONAL REGISTRATION OF PLUMBERS.

THE Mayor of Limerick presided at a public meeting held in the Athenæum, Limerick, the other day, under the auspices of the Limerick Local Committee for the National Registration of Plumbers. There was a good attendance of representatives of the Corporation, the medical and architectural professions, the plumbing trade and the general public. Mr. W. Kaye Parry, M.A., B.E., gave an interesting lecture dealing with the relations existing between sanitary plumbing and drainage and the public health. It was pointed out that wherever a proper system of drainage and water supply has been carried out the death-rate has materially decreased, while those countries which are behindhand in sanitary matters have without excep-

tion a constantly higher death-rate. Statistics were quoted showing that for every person who died in England and Wales from typhoid fever between 1885 and 1889 about five persons died from the same disease between the years 1850 and 1854. Reference was made to Dr. Hoare's comparative statement of cases of typhoid fever occurring in clean and dirty houses at Buda Pesth. In this statement the houses were classified under the heads of "good," "fairly good," "dirty" and "very dirty," and it was shown that there were nearly twice as many cases of typhoid in the "very dirty" houses as in the "good" ones.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 8685. John Harding, for "Improvements in and relating to doors and movable partitions."
- 8690. Alexander Gray, for "Improvements in hose pipes."
- 8730. Elizabeth Whitehead, for "An improved spring-door fastener."
- 8731. Elizabeth Whitehead, for "An improved automatic door latch."
- 8751. Thomas Baker Brown, for "Improvements in and relating to window-sashes."
- 8761. George Denis Roland, for "Improvements in fastenings for metal tyres or rims for velocipedes and for like purposes."
- 8811. William Henry Brown, for "An improved clinograph or mathematical drawing instrument."
- 8828. Joseph William Leigh, for "Improvements in the construction of fireproof floors and roofs."
- 8841. Nathan Pendlebury Frith Sandiford, for "Improvements in or applicable to fire-grates."
- 8842. James Hacking, for "Improvements in chimney cowl and ventilators."

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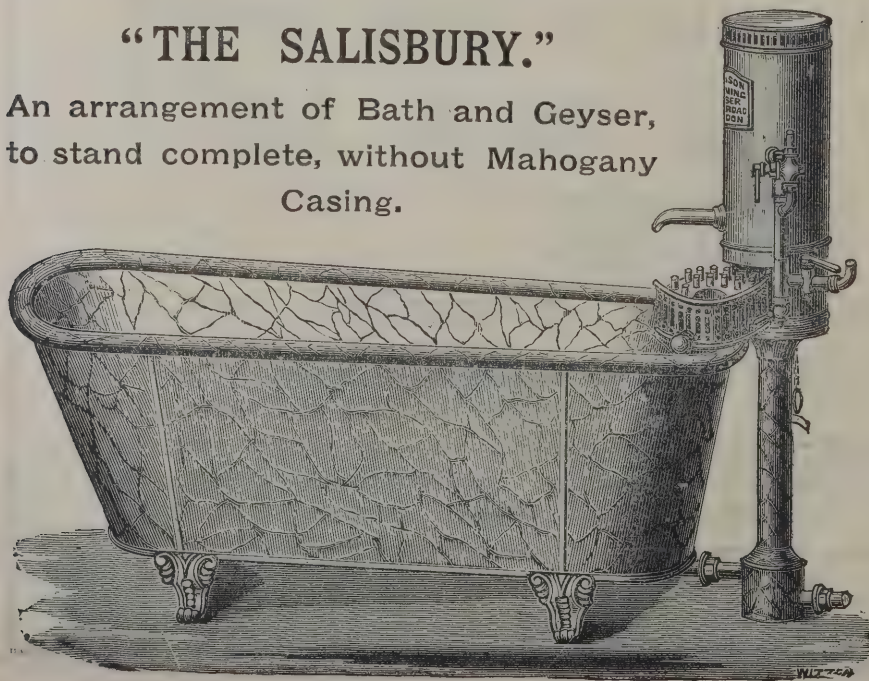
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TENDERS, ETC.

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EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

LEEDS.—May 31.—Designs are invited for Public Baths. City Engineer, Municipal Buildings, Leeds.

LUDLOW.—May 30.—Prizes of 25*l.*, 15*l.* and 10*l.* are offered for Schemes for Disposal of Sewage. Mr. John H. Williams, Town Clerk, Ludlow.

ROCHESTER.—June 26.—Designs are invited for the Sewerage of the Village of Borstal. Premiums of 25 Guineas and 10 Guineas. City Surveyor, Guildhall, Rochester.

WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50*l.* and 25*l.* Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10*l.* Mr. Horatio Brevitt, Town Hall, Wolverhampton.

CONTRACTS OPEN.

ABERLECHAU.—June 7.—For Building Board School for 84 Children. Mr. A. O. Evans, Architect, Market Chambers, Pontypridd.

AMBLE.—May 27.—For Building Congregational Church. Rev. J. Bowron, Dilston Terrace, Amble.

BALHAM.—May 29.—For Building Postal Sorting Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

BATH.—May 27.—For Building Avenue to Market. The Town Clerk, Guildhall, Bath.

BIRKENHEAD.—May 31.—For Additions, &c., to Holt School of Science and Art. Mr. C. Aldridge, Architect, Central Buildings, North John Street, Liverpool.

BUDLEIGH SALTERTON.—June 7.—For Construction of Pumping Station and Reservoir, also Pumping Machinery, Providing and Laying Cast-iron Pipes, &c. Mr. J. M. Martin, Engineer, Bradninch Place, Exeter.

BRADNINCH.—May 26.—For Building Police Station. Mr. E. H. Harbottle, Architect, Exeter.

BURNLEY.—May 26.—For Enlarging Post Office. Postmaster, Burnley.

CANNING TOWN.—May 30.—For Building Keeper's Lodge at Recreation Ground. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CHELMSFORD.—June 12.—For Building Warehouse, Show-room, Offices and Shops. Mr. F. Chancellor, Architect, Chelmsford.

CHELTHENHAM.—June 7.—For Building Chapel. The Secretary, The College, Cheltenham.

CROYDON.—May 31.—For Repairs, Cleaning and Colouring at Board Schools. Mr. Barrow Rule, Clerk to the School Board, Katherine Street, Croydon.

HARROGATE.—May 27.—For Building House. Messrs. H. E. & A. Bown, Architects, James Street, Harrogate.

HOLBORN UNION.—May 29.—For Apparatus for Heating and Hot and Cold Water Supplies. Mr. H. Saxon Snell, Architect, 22 Southampton Buildings, Chancery Lane.

KENDAL.—June 6.—For Additions to Town Hall. Mr. S. Shaw, Architect, Kendal.

KENSINGTON.—May 29.—For Additions to Horsekeeper's House. Mr. W. Weaver, Surveyor to the Vestry, Town Hall, Kensington.

LEICESTER.—June 24.—For Two Triple Expansion Pumping Engines. Mr. J. B. Everard, Engineer, 6 Millstone Lane, Leicester.

LEVENSHULME.—May 29.—For Building National School. Mr. J. H. Maybury, Architect, 25 Booth Street, Manchester.

LONDON.—May 30.—For Enlarging North-Western District Post Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

MANCHESTER.—May 29.—For Light Movable Hand Cranes, Pipe, Carriages and Winches, for the Corporation Waterworks. Mr. G. H. Hill, Engineer, Albert Chambers, Albert Square, Manchester.

MIDDLESEX.—May 29.—For Supplying and Delivering Broken Granite to various Railway Stations, &c. Mr. F. H. Pownall, 9 Great George Street, Westminster, S.W.

NENAGH.—June 6.—For Building Parish Church. Mr. Walter G. Doolin, M.A., Architect, 20 Ely Place, Dublin.

NEW SHOREHAM.—May 30.—For Erection of Infirmary Buildings, &c. Mr. Arthur Loader, Architect, 54 Old Steine, Brighton.

NORTH-EASTERN RAILWAY.—May 31.—For Building Stables (Forty-two Horses), Loose Boxes and Keeper's House, Leeds. Mr. Wm. Bell, Company's Architect, York.

OLNEY.—For Construction of Stone and Iron Bridge. Mr. R. J. Thomas, Bucks County Surveyor, Aylesbury.

PARC GWILLT.—May 31.—For Building Two Blocks for 126 Patients each, at County Asylum. Messrs. John Giles, Gough & Trollope, Architects, 28 Craven Street, Strand, W.C.

PATRICROFT.—May 31.—For Building Vagrants and Probationers' Wards at Workhouse, also Lodge, &c. Messrs. Mangnall & Littlewoods, Architects, 29 Brown Street, Manchester.

PELLON.—May 29.—For Building Sunday School. Mr. J. Farrar, Architect, 29 Northgate, Halifax.

PENYBONT.—May 27.—For Building Twenty Cottages. Mr. E. A. Lansdowne, Architect, National Bank of Wales Chambers, Newport, Mon.

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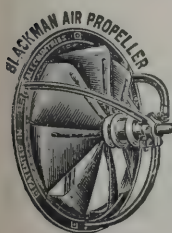
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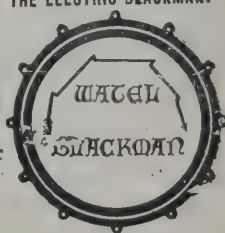
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PURLEY.—May 31.—For Tar-paving and Brick-edging at Cane Hill Asylum. Mr. R. W. Partridge, 21 Whitehall Place, S.W.

QUEENSBURY.—May 30.—For Converting Building into Hospital, Erection of Additional Buildings, &c. Mr. John Drake, Architect, Winterbank, Queensbury.

SHEFFIELD.—May 27.—For Building Sunday Schools—one in Channing Street, the other in Don Road. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

ST. ALBANS.—June 6.—For Building Police Station. Mr. A. H. Debenham, Town Clerk.

SUNDERLAND.—May 27.—For Erecting Superstructure of Asylum. Mr. G. T. Hine, Architect, 35 Parliament Street, Westminster.

SUTTON-IN-ASHFIELD.—May 29.—For Extension of Gas-works. Mr. C. E. Jones, Engineer, Chesterfield.

TOXTETH PARK.—May 31.—For Building Mortuary and Alterations to Local Board Offices. Mr. John Price, Surveyor, Local Board Offices, Lark Lane, Toxteth Park, Liverpool.

WALTHAMSTOW.—June 3.—For Additions, &c., to The Chesnuts. Mr. W. P. Gepp, Chelmsford.

WATFORD.—June 3.—For Widening and Part Re-construction of Bridge. Mr. Urban A. Smith, Hertford County Surveyor, 26 Victoria Street, S.W.

WISBECH.—June 3.—For Building Water Tower, Providing Wrought-iron Tank, Girders, &c. Messrs. Easton & Co., Engineers, 11 Delahay Street, Westminster, S.W.

WICKHAM BISHOPS ASYLUM.—June 3.—For Trial Well Borings. Mr. W. P. Gepp, Chelmsford.

YNYSYBWL.—June 7.—For Building Board School for 158 Children. Mr. A. O. Evans, Architect, Market Chambers, Pontypool.

TENDERS.

BURSLEM.

For Enlargement of Offices, &c., for the Burslem School Board.

Mr. A. R. Wood, Architect, Tunstall.

W. Cooke £857 0 0

R. C. Elsyby 800 0 0

W. GRANT, Burslem (accepted) 799 0 0

ABERGWYNFI.

For Building New Church at Abergwynfi, South Wales. Messrs. HALLIDAY & ANDERSON, Architects, Cardiff.

Jenkins & Son, Porth	£2,800	0	0
Stephens, Bastow & Co., Bristol	2,713	0	0
Jones Bros., Gloucester	2,611	0	0
GAYLARD, Bridgend (accepted)	2,590	0	0
Newby & Co., Cardiff	2,529	0	0
Hatherly & Carr, Bristol	2,503	0	0
Morgan, Llandore	2,249	0	0
Berridge, Cardiff	1,820	0	0

BISHAM-ON-THAMES.

For the Erection of Stable Buildings and Entrance Lodge, for Mr. Percival Harter, Bisham-on-Thames. Messrs. KIDNER & BERRY, Architects, 23 Old Broad Street, London, E.C.

Webster & Cannon	£3,098	0	0
Silver & Son	3,059	0	0
Lawrance & Son	2,978	0	0
Y. J. Lovell	2,734	0	0
W. Watson	2,690	0	0
S. J. SCOTT (accepted)	2,663	0	0

BRIGHTON.

For Additions to Laundry and Works in Connection, Victoria Baths, Brighton. Quantities by Mr. FRANCIS J. C. MAY, C.E., Architect, Town Hall, Brighton.

Longley & Co., Crawley	£1,145	0	0
Bishop & Co., Shoreham	950	0	0
Barber & Olliver, Hove	900	0	0
W. A. Field & Co., Brighton	810	0	0
SATTIN & EVERSHED, Brighton (accepted)	785	0	0

CARBIS BAY.

For Erection of a new Hotel at Carbis Bay, Cornwall, for the Carbis Bay Hotel Co., Limited. Mr. SILVANUS TREVAIL, F.R.I.B.A., Architect, Truro.

S. Trebane, Liskeard	£3,400	0	0
W. J. Winn, Helston	3,075	0	0
J. Julian, Truro	2,930	0	0
W. H. Stephens, Penzance	2,924	0	0
J. COLLIVER, Truro (accepted)	2,912	0	0
Architect's estimate	3,250	0	0

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For Fitting and Finishing Shop at Catford Bridge, for the Forest Hill Meat Company. Mr. ALBERT L. GUY, A.R.I.B.A., Architect, 78 High Street, Lewisham.
J. O. RICHARDSON, Peckham (accepted) . . . £300 0 0

CATFORD.

For certain Alterations and Additions to the Plough and Harrow Beerhouse, Catford, for Mr. Vernon. Mr. ALBERT L. GUY, A.R.I.B.A., Architect, 78 High Street, Lewisham.
D. & R. KENNARD, Lewisham Bridge (accepted) £300 0 0

LLANWRDA.

For Restoration of Parish Church of Llanwrda. Mr. STEPHEN W. WILLIAMS, F.R.I.B.A., Architect, Rhayader. Quantities by Architect.

D. Jenkins, Swansea £1,300 0 0
J. D. Williams, Knighton 1,266 0 0
C. Edwards, Leominster 1,170 0 0
Thos. Watkins & Co., Swansea 1,144 0 0
S. Deakins, Knucklas 952 10 0
Alfred Meredith, Newbridge-on-Wye 900 0 0
EVANS & SON, Llandewi Brefi (accepted) 797 0 0

LEWISHAM.

For Pulling Down and Rebuilding the Anchor Beer-house, Lewisham Road, S.E., for Messrs. Whitbread & Co., Limited. Mr. ALBERT L. GUY, A.R.I.B.A., Architect, 78 High Street, Lewisham.

Worsley £1,546 0 0
Godfrey & Sons 1,497 0 0
S. J. Jerrard 1,487 0 0
Soper 1,441 0 0
Courtney & Fairbairn 1,167 0 0
KENNARD, Lewisham Bridge (accepted) 1,100 0 0

For Building Five Shops on land adjoining Bath House, High Street, Lewisham. Mr. ALBERT L. GUY, A.R.I.B.A., Architect, 78 High Street, Lewisham.

D. & R. KENNARD, Lewisham Bridge (accepted) £3,200 0 0
For the Erection of Two Shops on the Brook House Estate, High Street, Lewisham, for Mr. E. Mac F. Patterson, Mr. ALBERT L. GUY, A.R.I.B.A., Architect, 78 High Street, Lewisham.

D. & R. KENNARD, Lewisham Bridge (accepted) £1,600 0 0

LITTLE BOOKHAM.

For New Farm Buildings, &c., at the Manor Farm, Little Bookham, for Sir Francis Boileau, Bart. Mr. WILLIAM J. SHEARBURN, Architect, Dorking, and Effingham House, Arundel Street, Strand.

HAMBLIN BROS. (accepted) £535 0 0

LONDON.

For Building Tower, Porch, Vestibule, Colonnade, Narthex, &c., to Church of the Servite Fathers (Servants of Mary), South Kensington, for the Very Rev. Prior Appolloni, O.S.M. Mr. JOSEPH STANISLAUS HANSOM, F.R.I.B.A., Architect, 27 Alfred Place West, South Kensington.

GEORGE PORTER (accepted) £4,804 0 0

For Reconstructing the Queen Adelaide Public-house, Hackney Road, N.E., for Messrs. Chandler & Co. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

A. Reed & Son £2,684 0 0
Hearle & Farrow 2,510 0 0
W. Watson 2,494 0 0
W. Shurmur 2,484 0 0
J. & H. Cocks 2,326 0 0
Coulsell Bros. 1,976 0 0

For Fitting-up the Queen Adelaide Public-house, Hackney Road, N.E., for Messrs. Chandler & Co. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

W. Shurmur £729 0 0
W. Watson 696 0 0
Hearle & Farrow 675 0 0
J. & H. Cocks 659 0 0
Reed & Son 639 0 0
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For the Completion of Three Houses, Nos. 7, 8, and 9 Bowes Terrace, Marlborough Road, Bowes Park, Wood Green, N., for the National Land Corporation, Limited. Messrs. POOLEY & FOLLETT, Architects and Surveyors, 21 John Street, Adelphi, W.C.

Edward Hughes, Stroud Green £239 0 0
George Spicer, Herne Hill 228 10 0
Reuben Hill, Tottenham 222 10 0
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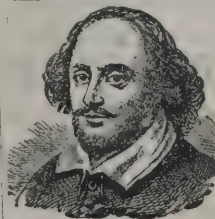
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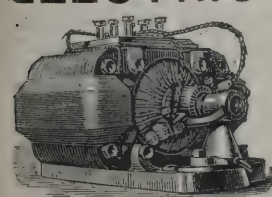
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LEAVESDEN.

For Erecting an Isolation Block at the St. Pancras Schools, Leavesden, Herts, for the Guardians of the Poor of St. Pancras. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities by Messrs. CORDEROY & SELBY and Mr. W. T. FARTHING.

Reed, Blight & Co.	£5,707	0	0
W. H. Lascelles & Co.	4,997	0	0
W. Johnson & Co., Limited	4,507	0	0
Leslie & Co.	4,280	0	0
C. Miskin	4,150	0	0
THOS. TURNER, Limited (accepted)	3,931	0	0

MARLOW.

For Works of Repair, &c., to Marlow Bridge.

S. Hipwell, Wisbech	£695	0	0
H. Simonds, Reading	666	10	0
W. J. Aldred, London	648	0	0
Webster & Cannon, Aylesbury	581	0	0
G. H. Gibson, High Wycombe	554	0	0
T. R. Coster, Great Marlow	492	0	0
H. Hill, Maidenhead	487	8	0
T. Wellicome & Sons, Great Marlow	473	15	0
F. TALBOT, Reading (accepted)	462	6	4

NEW TREDEGAR.

For Building House and Additions to Workmen's Hall, New Tredegar. Messrs. AARON DAVIES & SON, Architects, Pontlottyn.

T. Davies, Pontlottyn	£340	0	0
T. Thomas, New Tredegar	337	0	0
W. Hardy, Blackwood	245	0	0
Freeman & Hardy, New Tredegar	240	0	0

SOUTHEND-BY-CATFORD.

For retaining Wall to the River Ravensbourne in the rear of the Tiger's Head Publichouse, Southend-by-Catford, S.E., for Messrs. Whitbread & Co. (Limited). Mr. ALBERT L. GUY, A.R.I.B.A., Architect and Surveyor, 78 High Street, Lewisham.

J. WOODHAM, Sydenham (accepted)	£199	0	0
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SUDBURY.

For the Erection of New Catholic Church, Sudbury, Suffolk. Mr. LEONARD STOKES, Architect, 3 Princes Street, Westminster.

GEORGE GRIMWOOD & SONS, Sudbury (accepted).

SUDBURY—continued.

For Building Board School for Boys, Pinner Road, Sudbury. Messrs. HOUSTON & HOUSTON, Architects, 13 Farnival's Inn, E.C. Quantities by Mr. ALAN PAULL, F.S.I., 6 Quality Court, W.C.			
J. Chessum & Sons, Haggerston	£2,553	0	0
S. Grist, Aylesbury	2,438	0	0
J. Smith & Sons, South Norwood	2,415	0	0
H. Haynes, Alpertown	2,395	0	0
R. Ballard, Child's Hill	2,337	0	0
H. M. Dove & Co., Watford	2,330	0	0
F. G. Minter, Bridle Lane	2,297	0	0
Gullett Bros., Wealdstone	2,291	0	0
T. Tilbury, Sudbury	2,280	0	0
C. Jackson, Vauxhall	2,279	0	0
F. LARTER, Harrow Weald (accepted)	2,260	0	0

WANSTEAD.

For the Erection and Fitting-up of the Lord Rookwood Publichouse, Cann Hall Road, Wanstead, E., for Mr. Chas. W. Emery. Mr. FRED. A. ASHTON, Architect, 3 Crooked Lane, E.C.

W. Shurmer	£4,320	0	0
A. Reed & Son	4,296	0	0
W. Watson	4,275	0	0
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DUDHOPE WORKS, belonging to Messrs. William Fergusson & Sons, manufacturers of jute fabrics, Dundee, has been restarted, after having been reconstructed consequent on the damage done by fire about twelve months ago. Employment is thus afforded for about 400 operatives.

THE East District Committee of the Berwickshire County Council have accepted an offer by Messrs. Henderson & Duncan, Morningside, Edinburgh, for the erection of a bridge, &c., on the Whitadder at Abbey St. Bathans, at a cost of 2,139*l*.

A LARGE clock with Cambridge chimes has just been erected in the parish church of South Mimms, Herts, by Messrs. John Smith & Sons, Midland Clock Works, Derby.

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SPECIAL ATTENTION GIVEN TO ARCHITECTS' DESIGNS.

A LIST of ART PLATES published in "THE ARCHITECT" will be forwarded on application to P. A. GILBERT WOOD, PUBLISHER, 170 STRAND, LONDON, W.C.

The Hornchurch Board Schools, near Romford, are being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

VARIETIES.

LAST week Messrs. Ball, Norris & Hadley sold by auction the corner block of freehold property comprising Nos. 241, 243 and 245 Oxford Street, two doors from Oxford Circus, for 16,300*l.*, a price equal to thirty years' purchase of the present rentals, or 23*l.* a square foot.

THE Kirkcaldy Harbour Commissioners have considered and adopted Mr. Hall Blyth's report on the proposed new harbour for Ravensraig. The undertaking is estimated to cost 300,000*l.*

The first of the Polytechnic trips for the World's Fair, at Chicago, arrived in New York on Friday afternoon last. These trips will be continued every week up to August 5. The parties travel by the Guion Line from Liverpool every fortnight, and from Southampton every Friday and Saturday by the Inman and Hamburg-American Lines. A few vacancies still remain. Full detailed prospectus can be obtained from the Secretary, the Polytechnic, 309 Regent Street.

THE Berlin correspondent of the *Standard* says:—Plans are being made for the construction of a new palace, large enough to contain the Imperial Family and the whole court suite at Belitskaya Pushta, in the province of Grodno. The site chosen is in the midst of the great forest of Pushta, enabling the Emperor of Russia to enjoy the greatest retirement combined with the pleasures of the chase. The cost of the palace will be about three millions.

In the *Boy's Own Paper* an article on "Brasses and Brass-rubbing for Boys" is published by Mr. A. P. Burke Downing.

THE late Mr. George Pownall, surveyor, has left personally valued at 24,810*l.*

THE foundation-stone of the Technical School was laid on Wednesday by Mr. William Hunter, the Master of the Clothworkers' Company, at Halifax. The building is to cost 20,000*l.*

THE appeal brought by the legal representatives of the late Dr. Beaney against the legality of the bequest of 10,000*l.* for the establishment of a free library at Canterbury, England, has resulted in a decision that the bequest is invalid.

THE Special Committee of the City of London Court of Common Council have selected a design for the gold casket to contain the "freedom" for Sir John Gilbert, R.A., the successful competitors being Messrs. Mappin Brothers.

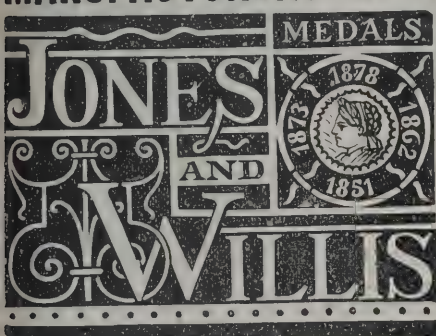
ELECTRICAL.

THE *Windsor and Eton Gazette* says:—We observe that with a view to assisting the development of electric lighting in Windsor, which has hitherto made such tardy progress, Messrs. Laing, Wharton & Down, of 82A New Bond Street and 17 Gracechurch Street, London, have appointed as their resident representative in this locality Mr. Dunning, of 6 Clifton Villas, Devereux Road, Windsor. The firm has, among their larger operations, supplied special artistic electric light fittings to Marlborough House, for the Prince of Wales; to St. James's Palace, for H.R.H. the Duke of York; to Eaton Hall, for the Duke of Westminster; to Lord Windsor and many other gentlemen of rank; numerous extensive installations, such as a complete plant for 2,000 lights for Thring Park, for Lord Rothschild; while among the smaller works have been the installation at St. John's, Beaumont College; fittings for the London residence of Judge Holl, County Court Judge for Windsor.

WITH the gradual extension of electric lighting in Windsor, private "plant" installations are increasing in the surrounding neighbourhood. One of these is at St. John's, the junior division of Beaumont College, Old Windsor. The plant consists of an "Otto" h.p. gas-engine, an Edison Hopkins (Mather & Platt's) dynamo, 59 electrical storage accumulators of 1,888 L. type. The requisite gas is obtained from the Egham Company's main, and the machinery is capable of running at least 210 incandescent lamps of 16 c.p. each, with a current of 150 volts and 85 amperes. Besides the engines and dynamo there are as valuable accessories a Laing, Wharton & Down switchboard, voltmeter, self-recording ammeter, automatic cut-out between the cells and the dynamo, and an over-discharge alarm, the whole being under the charge of Mr. Durrant. The installation was laid down by Messrs. Laing, Wharton & Down, and during the four years it has been in existence it has worked to the satisfaction of the college authorities.

THE *Manchester Guardian* says:—It is expected that incandescent lamps for the electric illumination of the whole of the British Museum will shortly be substituted for the more

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London	Church
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N.S.W.	Parish Church
Durban Town Hall, S.A.	Windermere Church
Royal Military Exhibition, &c., &c., &c.	Eiffel Tower, Paris
	GOLD MEDALS—Huddersfield, 1883, LONDON, 1885.
	SILVER MEDAL—PARIS 1889.

elementary system still for the most part prevailing. Incandescent lights, somewhat modified, in their presentation by the requirements of the special position and purpose to which they were to be adapted, have been in partial use in one or two of the galleries and detached apartments of the Museum, especially in the large vase-room of the department of Greek and Roman antiquities and throughout the department of British and Mediaeval antiquities and ethnography. These lights have given great satisfaction, and the frequenters of the reading-room and other parts have lately been encouraged to expect the speedy extension of the system.

A HIGH LEVEL BRIDGE OVER THE MERSEY.

A SCHEME for a high level bridge over the Mersey, rivalling in magnitude the great bridge at New York, has been prepared by Messrs. J. J. Webster, C.E., of Westminster, and Mr. J. T. Wood, C.E., of Liverpool. The bridge is designed on the arch suspension principle, and is to consist of three spans, each of 1,150 feet, the centre span being 150 feet above the river at high water. The plan admits of a roadway 40 feet in width for vehicular traffic, and footways of 7 feet 6 inches on either side. Above is a railway for electric tramcars. Exclusive of this tramway line the cost is estimated at 1,730,000. It is stated that at present there is paid for the conveyance of goods and passengers across the river by lighters, ferry steamers, and the tunnel 195,000. a year, of which 105,000. is paid for goods traffic alone. The promoters estimate that the fact of the bridge being available night and day, whatever the state of weather and tide, would lead to a great increase of traffic, and that the income would be not less than 165,000. a year. The Liverpool approach to the bridge would be from St. George's Crescent, with a gradient of one in 35, and the Birkenhead from Hamilton Square. The bridge will leave the Liverpool side at the landing-stage, touching the Cheshire side at the Wallasey Dock.

THE NEW PIER AT DOVER.

ON Monday the new promenade pier at Dover, which has been in course of construction for the last eighteen months, was opened by Lady Dickeson, the wife of the chairman of the company. The pier is approached from the Marine Parade, and runs out as nearly as possible in the centre of the bay. The

pier is 900 feet in length and 30 feet wide from the entrance gates to the commencement of the pierhead, some 670 feet, when it opens out to a width of 100 feet. There are two embayments on each side of the narrower portion of the pier, in which are placed ornamental kiosks. There are comfortable lounging seats at intervals the whole length of the pier, whilst at each corner of the head circular covered wind-screens are erected, and wind-screens are also placed at other points. The principal architectural feature of the pier will be the pavilion, for the erection of which it is understood that Sir Edward Watkin, on behalf of the South-Eastern Railway directors, has promised to advance the Pier Company the requisite funds. The concert-room in the pavilion will be capable of seating 1,000 people, with a stage 38 feet long by 30 feet wide, green-room, &c. There will also be a spacious dining-room commanding a charming sea-view, refreshment-room, lavatory accommodation, together with four octagonal rooms to be placed at each corner of the pavilion, which can be used as reading-rooms, or for any other purpose. The erection of this pavilion is looked forward to in the town, as it is felt that the success of the undertaking depends to a great extent on this being promptly proceeded with. Lovers of fishing are to receive consideration at the hands of the company, who will set apart a lower deck for their benefit. A landing-stage is also in course of construction, at which pleasure steamers plying between Dover and towns round the coast and to London may land and take up passengers. The pier was designed by Mr. J. J. Webster, C.E., and Mr. A. Thorne was contractor.

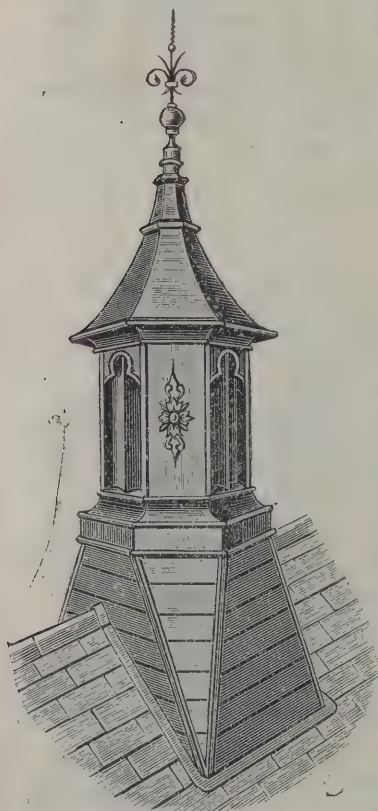
After the opening of the pier the chairman of the company entertained upwards of five hundred persons. Sir Richard Dickeson, in proposing "Success to the Promenade Pier," referred to the difficulties which had to be overcome in starting the project. He alluded to the large expenditure which had been entailed in some other coast towns, notably at Folkestone, in erecting similar piers. The contract for the Dover Pier had not exceeded the modest amount of 14,000., and all the expenses included in the outlay would be covered by less than 18,000. In order that the pier might be economically constructed the directors themselves had guaranteed about 3,000. He computed that, by only a moderate use of the pier, even before the pavilion was erected, which they hoped would be started next winter, the pier would earn a dividend of nearly 10 per cent. They did not want to incur debt, and therefore they asked that the rest of the money should be assured before the pavilion was commenced.

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PRACTICAL ELECTRICAL PROBLEMS AT CHICAGO.*

IT is not the object of this paper to traverse beforehand the topics which are to be submitted to discussion at the Electrical Congress to be held at Chicago three months hence. The opinion of that Congress is to be taken upon certain matters of utmost importance, such as the final adoption of international units and standards, as well as other questions of nomenclature which are of international convenience. To attempt to forestall the decisions of the Congress on these or other matters by raising a discussion on them here would be both ill-timed and discourteous. My object is entirely other. It is, in brief, to draw your attention to a number of matters which are at present engaging the notice of electricians, matters which are for the most part on the verge of scientific progress, matters partly within and partly without the range of the practical electrician. From that border-region, just outside the limit of actual commercial practice, must inevitably come the next advances in the industry. Every one who is familiar with the history of inventions knows how it is that, before any great world-compelling invention takes practical form and shape it is more or less consciously existent; it is "in the air"; the pioneers are alive to its possibilities, though they may be accounted but as dreamers of the impractical. Discovery of the abstract order, often unrecognised as to its importance, yet none the less pregnant of result, almost invariably precedes invention. The task of reducing to serviceable form, fit for use, the newly-discovered abstract truths is the problem before the inventor, who, indeed, may be both discoverer and inventor in one, the pioneer both in science and in industry. Of late there has been a lull in electrical invention. Not that the footsteps of inventors have ceased to dog the Patent Office, or that the streams of out-flowing specifications have been dried up. It is the quality, rather than the quantity, of recent electrical inventions that has declined. Those eventful years, from 1873 to 1883, which may be said almost to have created the modern electrical industry, saw the introduction of many radically new inventions, many really novel departures in the application of science, and the very fertility of that harvest of invention seems to have for a time exhausted the soil.

But the apparent pause in the progress of events is the real

* A paper by Professor Silvanus P. Thompson, D.Sc., F.R.S., read at the meeting of the Society of Arts on the 3rd inst.

time for the progress of ideas, the epoch for the incubation of new suggestions. Once the new ideas have taken form and growth the development from them of new inventions is a logical certainty. The new inventions must and will come. We seem now to be approaching the close of the period of lull, and the new ideas that have been gradually spreading and rooting may be expected to crop up in invention. We seem to be treading on the verge of new methods, new appliances, new results.

At such a time, as circumstances have decreed, we are to meet our electrical brethren, not only of the United States—but that home of free ideas and unbiassed progressiveness—but also of other countries, in friendly converse as to the progress of that art and science in which we are most interested. We shall rub shoulders, and exchange views and opinions with them, discuss our special varieties of practice, our special points of experience, our expectations and hopes and doubts. We shall have much to learn from one another; and, in the amicable rivalry of nations, we shall all be keen to make the most of our opportunities.

What, then, are the points that will interest us most? What are the burning questions that will awake our attention? Let us begin with some more sternly practical questions that confront the electrical engineer. The methods of working that prevail in the matter of electric light and power present many points of divergence between different nations. One cannot help raising the inquiry why these divergences exist, and whether amongst them there is not a best way to be chosen? Let us consider them in detail.

Not only do we find divergences in the types of generating plant in habitual use in central stations, we find differences in the modes of distribution, even in the methods of house-wiring, differences which are not mere matters of taste or fashion. In the average English central station the dynamos are few and massive, and, for the most part, are mounted so as to be direct-driven each by its own separate high-speed engine. Belting and countershafts are conspicuously absent. In the average German central station, though both engines and dynamos differ in type from the English, direct-driving is almost universal. The main difference—as between British and German practice—is that in England, where land is dear, we build compact high-speed dynamos, and design special engines to suit them; whilst in Germany, where compactness is no great advantage, large slow-speed multipolar dynamos are designed to suit the large slow-speed engines. Contrast with this the average

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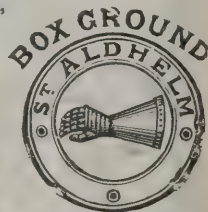
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American lighting station. The dynamos are not designed for the engines, nor the engines for the dynamos, and neither of them is specially designed for the particular station where it is to be erected. Both of them are, so to speak, taken from the stock of some particular factory; and as the dynamos are comparatively small, numerous and high-speed, whilst the engines are few, large and of slow speed, being ordinary factory or mill engines for the most part, engines and dynamos cannot be coupled direct, but must be geared by the intervention of countershafts, pulleys and belting. Not that there are some fine exceptions; for example, the Elm Street Edison Station in New York, the machinery of which was designed by Mr. Van Vleck, after a tour of inspection in Europe. Also some recent large combined plant of the Westinghouse Company. But for the most part, the leather belting is the one conspicuous feature of an American lighting station. Take, for example, that of St. Louis, Missouri, the largest arc-lighting station in the world. The engines are ten in number on the ground floor. They are single expansion engines of the Corliss type. The dynamos, 53 in number, are on the second floor. The whole of the first floor of the building is given up to a magnificent array of long countershafts, carrying some 70 pulleys, and leather belts, receiving power from below, and transmitting it to the floor above. Our cousins evidently believe in the truth of the adage that there is nothing like leather. We have absolutely nothing to show like this on our side, the nearest approach being the Westinghouse Station of the Metropolitan Company at Sardinia Street. This is an alternate current incandescent station, with all the engines on the ground floor, and all the dynamos on the floor above.

That it may not be said that I am giving, as an example, an old station, built in the dim and distant past of 1891, let me set alongside the St. Louis example the very latest one that came to hand but two days ago in the *Electrical World* (New York) of April 22, 1893. Therein is described the new central station of the city of Akron, Ohio, where there are four compressed condensing engines and seventeen dynamos, all belt-driven, and all on the same floor.

Compare this with such stations as ours of Manchester Square, or of St. Pancras, or the stations of the Westminster Company, or of the Kensington and Knightsbridge Company, or those of the St. James's Company. In none of these is there any countershafting or belting. Nor is there in the new Glasgow station; nor will there be for the new machines of the City of London Electric Lighting Company, at Bankside,

though in the temporary and transition plant rope-driving without countershafts has been employed. Not that I would dispute that there are advantages in driving by the aid of belts. The method has the obvious advantage that if a bad short-circuit occur, the belt is thrown off or broken before any other damage is done. In other words, it prevents armatures which are of inferior mechanical construction from being destroyed by an accident which ought to have been entirely impossible of occurrence.

Not only in the matter of direct driving, but in the whole design and construction of station switchboards, does practice diverge. The British engineer desires to have everything as solidly simple as possible. His ideal is simply a pair of omnibus bars, into which all the dynamos feed in parallel, and from which all the feeder-mains run off to the various circuits of the distribution. In some cases he falls short of this sweet simplicity, especially in those stations where a battery of accumulators is used, but that is what he desires to attain to. The American switchboard evinces an almost equally strongly marked ideal, the desire being to divide up the circuits and the generators into as many separate units as possible, while retaining the possibility of connecting up any one of the dynamos singly with any one of the separate circuits. The most recent and elaborate of such switchboards, resembling in the quantuplicity of its parts the multiple switchboard of a telephone exchange, is figured in the supplementary issue of the *Electrical Review* (New York) for February 25, 1893. It is the switchboard specially designed for the Manhattan lighting station, and is so contrived that, with seventeen circuits and nineteen dynamos, by no possibility can any two of the dynamos be put into parallel with one another.

Practice differs again in the mode of distribution by mains. An electric-light pole, and having a transformer hung on to it, where it brings the current to your house, is a sight which cannot be seen in England, simply because it does not exist. Our transformers are almost always put in fireproof cellars, and our mains run underground in conduits instead of overhead on poles.

In house-wiring, too, practice differs. The wooden casing that, thanks to the fire-office rules, is almost universal in England, is by no means universal elsewhere, and in some countries is almost unknown. It is probably destined to disappear in time, when safer modes of carrying wires are recognised. Wood-casing has three grave defects—it is neither damp-proof nor incombustible, and too often it covers, like charity, a

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multitude of sins. In this connection it is important to note that, in spite of the curious predilection of so many of our fire offices toward the use of wooden casing, the proportion of electrically-caused fires in this country is extremely low. This satisfactory circumstance must be attributed, not to the general use of wood-casing for house-wires, but rather to the very wholesome dread inspired by the vigilant and able surveyors of the chief fire offices, of whom Mr. Musgrave Heaphy is the most eminent, and who have, in spite of the curses so frequently showered upon their heads, insisted upon the prime requisites of good material and sound workmanship in all risks that they undertake to insure. If their requirements have seemed, in individual cases, hard or arbitrary, they have done incalculable good in stamping out the inferior work of scamping contractors. It is an open secret that some of the New York fire offices have become of late very uneasy about the increasing prevalence of electrically-caused fires. It is even stated, though I cannot name my authority for the information, that some of them have recently sent representatives to this country to learn how we manage to keep electric lighting safe. Doubtless we shall, at Chicago, exchange opinions on many of the details of this highly practical question. What is wanted is a mode of running the wires and fixing the switches and other accessories that shall not only be electric-tight, but shall also be water-tight, gas-tight, air-tight, oil-tight, fire-tight and rat-tight.

Upon the question of the degree of incandescence at which it is most economical to run glow-lamps, we shall probably find differences of opinion. It is obvious that the "smashing point" at which it pays to destroy old lamps depends upon the market price of lamps—a factor of the problem which is just now of a very uncertain nature. Whether Mr. Westinghouse's "stopper" lamp is made a commercial success or not, it is clear we are on the eve of a great revolution in the price of lamps. When they are really cheap, we shall give them short lives and merry ones, working them while they last at a higher degree of brightness, and therefore of efficiency.

Another battle of opinions, that will doubtless break out, will revive old controversy as to the relative merits of alternating and direct currents. The advocates of accumulators will come armed with the latest statistics to support the direct current, whilst the advocates of alternate currents will be challenged to produce practical motors that can be put upon their circuits. The great success of accumulator stations in England will doubtless whet the curiosity of our brethren, and inspire

them to point us to some still greater success of some other system on their side. It is very singular to remember in this connection that at the Philadelphia exhibition in 1884 there was not a single alternate-current dynamo shown—there was not, indeed, a single one in existence in the States, all machines at that date being for direct currents. Contrasting that epoch with the present, the growth of alternate-current systems to their present development seems truly remarkable. For now we have not only to discuss the general merits of alternate-current as against those of direct-current systems, but the relative merits of high-frequency as against those of low-frequency alternations, the merits of high-voltage as against those of low-voltage systems, and the merits of three-phase and four-phase alternate-current systems as against the simple ordinary two-phase alternate-current system. Possibly many of us are becoming tired of the eternal *drehstrom* question. The three-phase, high-voltage, long-distance transmission from Lauffen to Frankfurt eighteen months ago was a magnificent *tour de force*. It showed what could be done. The generators of that splendid experiment are still running to illuminate the town of Heilbronn. But it must be confessed that even here the three-phase system has remarkably little to show of advantage over the universal two-phase system. The complications it introduces by its substitution of three wires for two are not compensated for by any great gain. The supposed advantage that it permits the use of self-starting non-synchronous motors is apparently illusory; for it is clear that if the problem of giving us a satisfactory alternate-current motor, suitable for use on an ordinary two-phase circuit, has not been solved by Messrs. Hutin & Leblanc, it will be solved by Messrs. Stanley & Kelly, or by the engineers of the Oerlikon Fabrik, or by Messrs. Brown, Boveri & Co., or perhaps by all of these able engineers in as many different ways. As for any supposed superiority in other respects of a three-phase or a four-phase motor over a two-phase one, it is merely a question of plant-efficiency and of comparative unimportance.

Much more attention will, probably, be given to the battle of the frequencies. Very low frequency currents will apparently serve certain purposes that will make them of special use in particular cases. Many years ago M. Abdank proposed to use them for telephone signalling and to replace telephone batteries. On the larger scale, though excellent for operating motors, they are distinctly bad for arc lighting. In the processes of simplification in central station work we want to be able to run the arc and incandescent circuits off the same



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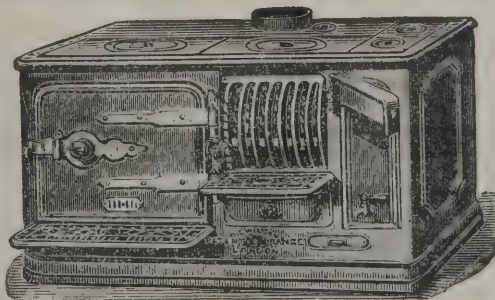
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simple pair of omnibus bars. If this ideal is ever to be obtained—and Mr. Ferranti tells us it is within our grasp—we shall have to keep up the frequency of our alternations, not lower it. In the other extreme direction we have had a most enticing field opened out by the researches of Mr. Tesla, and of Professor Elihu Thomson, upon very high frequencies. The strange properties of high frequency discharges when supplied at very high voltages raise new problems. We want, as a new invention, a frequency-raiser—an organ which shall transform the frequency, even as the induction-coil transforms the voltage. The frequency-transformers hitherto used in the laboratory for purposes of research—namely, the Leyden jar and Herz oscillator—are not practical for electric-lighting purposes. The phosphorescent glow of the novel high-frequency, high-voltage, high-vacuum lamps that Mr. Tesla promises us, costs as yet much more for equal quantities of light than any other form of electric illumination. Who will make the new departure that will bring such lamps within practical range?

We shall discuss high-voltage, too, from another point, namely, that of the utilisation of Niagara and other natural sources of power, by permitting of the economic transmission of power to long distances. Ever since 1879 this dazzling possibility has been before us. We may yet see Lord Kelvin's 80,000 volt transmission an accomplished fact. The three suggestions made in that year to attain an efficient high voltage have all been tried. Professors Ayrton and Perry's was to run the dynamo and motor both at a higher speed. Professors Thomson and Houston's was to put several dynamos and several motors in series. M. Achard's was to work with more powerful magnets in the machines. All three suggestions have their good points. They have been tried at Munich, at Creil, at the Gare du Nord in Paris, and notably at Frankfurt; but they have also been put into practical use by the aid of transformers, in scores of other places, and are at work to-day. What shall the next step be? Perhaps, at Chicago, we may hear from Professor Forbes exactly what is to be done at Niagara.

Closely connected with power transmission comes the problem of the electric railway, and the question of rapid transit by electrical means. Several thousands of electrically-worked tramway lines throughout the length and breadth of America attest the extraordinary progress of recent years. And if America cannot yet show one single electric railway on the scale of our City and South London line, it is probably because she has some great surprise in this direction in store

for us, and will throw our present advantage in this point into insignificance. Subsoil roads are certainly going to revolutionise the cross-traffic of all great cities. But will not America show us something much bigger and more daring than our little six-mile pair of tunnels from King William Street to Stockwell?

The applications of electricity to mining must also come in for discussion, and many other engineering applications. Many engineers are now alive to the possibilities of electromagnetic mechanism. Friction clutches are being superseded by magnetic ones; and a recent suggestion of Mr. Edison is to increase the grip between belts and pulleys by the introduction of magnetic adherence between them.

Turning from the problems of heavy engineering to those of lighter electrical appliances, there are still matters innumerable awaiting discussion. We shall have the new "telautograph" of Professor Elisha Gray to admire. We shall canvass the probabilities of its adoption and development as keenly as we did, nearly twenty years back, those of the telephone. It is a matter of congratulation that Dr. Gray, who at that time was somewhat cruelly pushed aside, in the pressure of events, from receiving his due share of recognition for the part he played in the early stages of telephonic progress, should now have made such an apparent success with the later creation of his inventive brain. The cruder tentative autographic telegraphs of the earlier workers cannot be put into the same line as the wonderfully perfect instrument which will assuredly be one of the features of the Chicago show. But there are other battles to fight in the telegraphic field. Our system of rapid automatic transmission, originated by Wheatstone, and perfected steadily and surely under the hands of the British Postal Telegraph Department, has not yet superseded all the older and slower forms of telegraphic instruments, even on those lines where press work and heavy commercial work demand the most perfect and efficient instruments. It is strange that in the United States, where such commercial considerations are deemed quite as important as they are with us, the adoption of the rapid automatic system should have been so slow. American telegraphers were not one whit less quick than we to perceive the advantages of duplex and of quadruplex working. In respect to quadruplex, though Europeans worked out both duplex and diplex, and had shown that by combining them a quadruplex transmission was possible, it was yet left to American electricians to put it into service and to devise the practical combinations for everyday use.

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The problem of the fuller utilisation of telegraph and telephone lines takes fresh importance every year as traffic thickens and the possibility of adding new lines beside those already darkening the air is narrowed down. Rapid automatic transmission is, for many purposes, a far more efficient service than the quadruplex. Then there is the question of harmonic duplex and multiplex telegraphs. There is the problem of multiplex service by the distributing device of Delaney, which is already being tried in the British telegraph system. At Chicago we shall see the phonopore doing service not only as a harmonic duplex but also for providing a telephonic service upon the railway signal lines to keep up communication from cabin to cabin of the block system. This ingenious adaptation of devices has received, since its inception by Mr. Langdon-Davies, numerous improvements in detail of late from that ever active veteran telegraph engineer, Mr. Spagnoletti, and I am told that the instruments at Chicago will also embody the results of some suggestions made by the officials of the British Post-office when the instruments were tried there.

The rapidity of signalling through cables is a matter to which our President of to-night—the official representative of Great Britain in matters electrical—has given much attention. He has shown us what careful design may accomplish in the matter of the telephone cables from England to France and from England to Ireland. The next step will be to show that it is possible to talk by telephone through the 120 miles of sea that separate England from Holland. There is not the least reason why that should not be done within the next twelve months. This is a matter to which recently I, too, have been giving some attention; and it is perfectly clear to me that, by taking into account the action of electro-magnetic induction in diminishing the retarding effects of capacity, and utilising that property rightly, it is only a question of time and money to effect telephonic communication through even an Atlantic cable. It is possible that at the present moment no two telegraph engineers would agree on the right way to carry out the thing. Few, if any, would deny the abstract possibility. It affords a splendid field for discussion. Above everything we want a few suitable hard facts of experiment as data to base argument and calculation upon. What seems certain is that there will be no more Atlantic cables built on the old plan, with a single conductor enclosed within an external armouring of iron. That type of cable is doomed for all rapid work. Long-distance telephony is no mere dream. Nor is hekto-plex telegraphy. And telegraphy without wires is already in iso-

lated cases an accomplished fact. Seeing by electricity, in spite of the telephonoscope which graced the Jubilee soiree of the Postal Telegraph Office, must be left to the twentieth century. We have problems enough to discuss at Chicago without entering upon that enticing phantom.

I have not time to enlarge upon electro-chemical themes, but we have many projects ripe for discussion. New methods of recovering and refining metals. The use of electricity in the preparation of chemicals, such as caustic soda, for the rectifying of oils and alcohols, and for the production of chlorine, ozone and bleaching liquors. The application, too, of electricity to hasten tanning and other similar processes of electric osmose deserves careful discussion. Electrolytic synthesis is an almost unworked line of investigation, and ought to be as fruitful as the electrolytic analysis that underlies all the plating and typing processes.

Those of us who may enjoy the benefits of a trip to Chicago will, it is clear, have to encounter a perfect tornado of electrical ideas. We go to mingle with our brethren of the electrical craft in friendly converse—as admirers, let us trust, rather than as critics. On whatever points of practice we differ, we may be sure the advantage is not all on our side, and shall be ready to give a hearty appreciation to and to enter into an intelligent understanding of the causes that produced those differences of practice, even when they are differences that tell against ourselves. There are moments when one would wish to dispossess one's self of the critical faculty and instead acquire an unlimited capacity for admiration. The exhibition itself will give us much matter for genuine admiration; the Congress will equally furnish us with food for thought. The country which produced a Franklin, a Henry and a Morse is happily still rich in citizens of distinction in electrical science, for it can boast a galaxy of names as eminent as those that can be produced by any country in Europe; as eminent not in abstract science only, but also in the work of pioneer investigation and in the genius for utilising the forces of nature for practical ends.

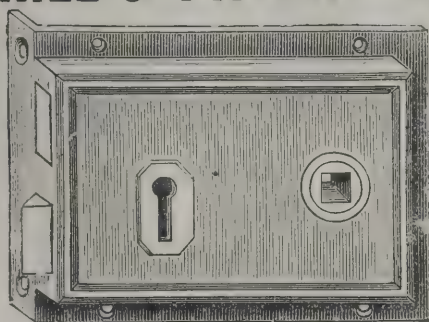
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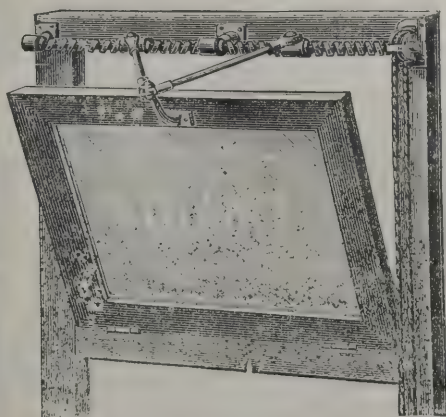
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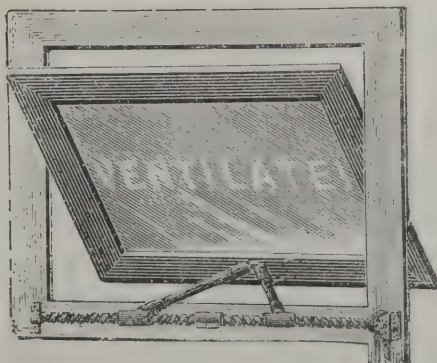
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New catalogues, as we previously mentioned, have been issued by the Edison & Swan United Electric Light Company, Limited, of 100 Victoria Street, S.W. The first, or Section I., deals with incandescent lamps. A very handsome variety of these are shown, and it is evident that the illustrations have been made with great care. These range from miniature to full sizes, and there are numberless illustrations of lamps for all kinds of special purposes; for instance, to mention one, there is a lamp specially designed for running under water, also for use in gunpowder mills, miners' lamps, for use in ships, for railway carriages, &c. Much interest attaches to the various lamps designed for all kinds of buildings, houses, mansions, hotels, restaurants, &c. The same remark holds good of the different designs shown for fancy lamps. Among the illustrations is one showing the offices at Ponder's End, where the company have their chief works. The interior of one of the fitting shops at these works is also shown.

Section II., which comprises between sixty and seventy pages, is devoted to electric light installation fittings. Every possible article seems to find a place in this list necessary or advantageous for any electric light installation, even ornamental reflectors and fancy shades not being overlooked, the latter being shown in coloured illustrations. One illustration that should have special interest just now shows a large Main Switchboard made for use at the Imperial Institute.

Section III. is concerned with electric light measuring instruments, and one feature of this list is the interesting and exhaustive descriptions given of various instruments. It is not possible to study the list without being struck with the strides that are being daily made in regard to the use of electricity.

ARCHITECTS AS BUILDERS.

AN action was brought by the committee of the Newport Athletic Club against Messrs. A. O. Watkins & Sons, architects, to recover 88*l.* 4*s.* 8*d.* as damages for breach of contract. It was remitted from the High Court to the local County Court. The *South Wales Daily Star* gives the following account of the proceedings:—

Mr. Hornby said the nominal plaintiffs were Mr. Edwards Bellerby and Mr. W. C. Phillips, who signed the agreement. About 1888 the Athletic Club decided to build a gymnasium. The present defendants were the architects, and another firm, not connected with the present action, were the builders. The building proceeded to within a reasonable distance of completion, when it showed signs of collapse. He did not think that would be disputed. On October 1, 1889, the defendants wrote a letter to plaintiffs in which they suggested certain things as a reason for the collapse, and in October 1889 a dispute arose as to why the building had given way. At the time it gave way it was, by the instruction of the defendants, propped or shored up to prevent it from further giving way. Just after the building was propped up it was inspected on behalf of the plaintiff club, and the gentlemen who then inspected it made certain recommendations as to what should be done. After considerable correspondence the agreement of March 21, 1890, was entered into. The defendant undertook for the sum of 650*l.* to finish the gymnasium, and give a guarantee for two years and a half. By this the position of Messrs. Watkins & Son was considerably altered; they had been the architects and servants of the club, but they now became the contractors.

His Honour: Was any other architect engaged?

Mr. Hornby: No.

His Honour: Then they were practically the architects and builders?

Mr. Hornby replied that that was so. The building was carried on by Messrs. Watkins & Son, and on September 1 the defendants wrote giving notice that they had completed their contract, and asking that the balance of the account should be

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paid. After the receipt of this letter the committee of the club appointed a sub-committee to inspect the building. The sub-committee attended the gymnasium on September 3, and they pointed out to Mr. Watkins certain things, the principal of which was the state of the floor for the purpose of lawn tennis. Mr. Edgar Watkins promised that these should be remedied. On the 8th the sub-committee found that these little things had been done, and recommended that the balance of the amount of the contract should be paid and the building taken over. Having regard to the fact that the building had previously to a certain extent collapsed, the committee thought they ought to have the building inspected to see whether it was fit for the purposes for which it had been erected. Three gentlemen, Messrs. C. W. E. Marsh, Togarmah Rees and T. D. Roberts, were requested by the plaintiff club to make an inspection of the building, and on October 20 they made a report in which they recommended certain alterations, but these were not carried out. Matters went on until July. At that time Mr. Marsh went to the gymnasium and noticed certain signs in the building. Having regard to the report he had previously made he recommended that some one should be engaged to inspect the building to see if it was necessary that anything should be done to it, and if so what. On Mr. Marsh's recommendation Mr. John McKaig was appointed, and attended several times at the gymnasium. On September 21, 1892, he sent in his report, which recommended a more elaborate scheme than had been carried out. He contended that the defendants were liable for the defects which had been found in the building before the time of the guarantee had expired.

A discussion took place as to the value of the work that had been done, and Mr. Bailhache, for the defendant, said that if the work was necessary they were willing to pay a sum that should be decided upon by Mr. John Linton.

Mr. Hornby inquired what Mr. Bailhache valued the buttresses at?

Mr. Bailhache said there were eight buttresses, which were worth 5%.

Mr. Hornby: We say they are worth 10%. We cannot agree to that.

After some further discussion it was decided that should his Honour decide in favour of the plaintiffs, the cost of the work should be referred to Mr. Hitchcox.

Mr. Hornby, continuing, read the correspondence which had taken place with defendants on the subject, in which they denied that the work which had been done was necessary. He

inquired if there was any dispute as to the condition of the building in 1889.

Mr. Bailhache said there was not. He suggested that no claim could arise under Clause 1 of the agreement. If they had a claim against the defendant, it came under Clause 8. He contended that the buttresses were absolutely useless, and did more harm than good.

In answer to his Honour, Mr. Bailhache said that he could not dispute defendants' liability for the condition of the building for two and a half years.

His Honour: Then I have to consider the cause of the defects and the means to remedy them.

Mr. B. Lawrence said that in October 1889 he was called upon to examine the building. The roof was about quarter covered, and the whole building had got into a state of collapse on account of the weight of the tiles. The piers on the north and south were off the perpendicular to the extent of 6 or 8 inches. The building was not safe, and he ordered the contractor to stop immediately as it was in a dangerous condition.

Mr. McKay, an engineer at the Isca Foundry, deposed that in August 1892 he was requested to report upon the state of the building. He then knew nothing of the agreement, or of the probability of an action against anyone. There were structural defects in the building, and the ribs were not strong enough for the purpose for which they were intended. He mentioned other defects in the building.

Mr. Togarmah Rees, C.E., said he inspected the building on October 9, 1890, in company with Mr. Marsh and Mr. Roberts. They prepared a report, which recommended that the building should be strengthened. He examined the building this month, and found defects which were not there in 1890. There were cracks across three piers on the south side, and it was obvious that some movement had taken place since October 1890. The buttresses would arrest this movement to a certain extent, but he should make them stronger still. He did not consider it was a perfect building, and in his opinion the buttresses were necessary, and had done good.

In reply to Mr. Bailhache witness said that the foundations were not very soft, and he knew of softer ones. They would stand any weight if there was sufficient base. He tested the buttresses on the south side, and they were practically plumb, as was also one he tested on the north side. He should not like to be a performer on the trapeze in the building, because the reaction on one of the ribs when a performer let go one

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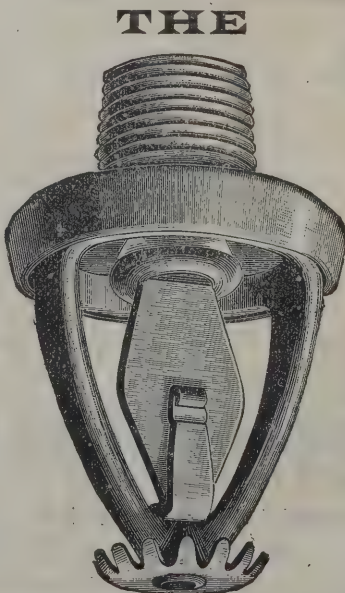
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trapeze to catch another would be tremendous. The cracks in the walls he thought were due to wind-pressure.

Mr. Hornby mentioned that there was no trapeze in the building; they did not put them up. There were rings there, but rings were very different to trapezes.

In reply to further questions from Mr. Bailhache, witness said there would be some amount of vibration caused by the rings, and had he been consulted he would not have recommended that they should be erected. There was not sufficient space on the north side to put up a flying buttress.

In re-examination Mr. Rees said that the buttresses erected would give more support than flying buttresses.

Mr. Marsh, C.E., a partner in the Isca Foundry, stated that his firm constructed roofs for the War Department and for foreign governments. He was requested to inspect the gymnasium when it was handed over by the contractor. He found no difficulty in discovering the defects in it, as they were obvious. In July 1892 he was casually in the building, and saw several cracks in the piers, which had taken place since his first report. These were caused by the thrust of the ribs outwards. Had the ribs been properly constructed there should not have been outward thrust of the walls, as they were constructed on what was known as the continuous principle. The ribs were very much distorted, which proved that they were incapable of carrying the weight upon them. He thought that the buttresses which had been erected were the best remedy that could be devised.

Mr. Benjamin Lawrence, architect, said that in certain places the walls were considerably out of the perpendicular, and there were cracks in the walls. In his opinion the buttress materially strengthened the building.

Mr. C. Miles said on January 25 he attended the gymnasium buildings with Mr. Lawrence. He agreed generally with the latter's evidence as to the state of the building, as to the work done, and as to the effect of the buttresses.

This concluded the case for the plaintiff.

Mr. Bailhache, for the defence, stated that the defendant took over the work of finishing a building which for some reason was in danger of coming down, and had "sagged" out. What the defendant had to do was to do the best he could under the circumstances, and to follow the plans as far as he could. The only deviations from the original plans were the tie rods.

His Honour: You say the buttresses were of no use?

Mr. Bailhache: We say they were not wanted. They have

sunk since they were put in, and in "sagging" they drew out the walls to some slight extent.

Mr. T. E. Watkins, the defendant, stated that he alone carried on the business covered by the present transactions. In March 1890 he entered into an agreement with Mr. Phillips and Mr. Bellerby, upon which the present action was brought. Describing the work, witness said he stripped the roof, and put four tie-rods across from the hammer-beams. The north wall was 7 inches out of plumb, and the south wall from 3 to 5 inches. He screwed as far as he considered safe. Then the north wall was 2 inches only out, while the south was practically plumb. In September 1890 he notified the committee that the building was finished under the agreement. Subsequently some of the committee and he went over the building, and they expressed their satisfaction with the building, with the exception of a few trivial things which he put right. He was paid for the work. In October 1892 he received a letter from Mr. Mark Phillips stating that there were several serious defects in the building, and that the committee desired to call his attention to it. He (witness) made a careful inspection, but did not find any indication of any hitches in the building. It was exactly as when he left it. The cracks in the top piers were not serious. These were due simply to screwing up the tie-rods, not from outside thrusting. In April last he made an inspection, and he then found a distinct move under the hammer-beam. The walls had given, and he noticed this for the first time after the buttresses were built. The buttresses pulled the walls over. The foundations under the buttresses were very poor.

Replying to Mr. Hornby, witness said that under the new agreement he regarded himself as the builder and not the architect for the club. The ribs, although not true, were strong enough for the weight they were intended to carry. There was no indication that the buttresses had torn away from the walls, but the wall and buttress had moved together.

William Eynon, a master carpenter, said that when the building collapsed the walls were pulled up until they began to crack. He saw them last October, and there was no difference in them from when they were completed.

The court then adjourned.

On the second day Mr. Hornby, before proceeding, asked his Honour to allow him to tender Mr. T. D. Roberts in evidence, as he was called away.

Mr. T. D. Roberts, district engineer for the G.W.R., said that in October 1890, at the request of the club he inspected

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the gymnasium, and presented a report. He visited the building about ten days ago. He found an indication of a movement of the walls near the principal. There were no such indications when he examined the building before. The wall was only 14 inches in thickness, and by the movement of the roof it had been strained and fractured.

His Honour inquired if Mr. Roberts considered it a safe building.

Mr. Roberts: I am sure it is not a building that I would put up as a safe building. I do not wish to criticise the architect, but I do not consider it a safe and sound building. The buttresses are in my opinion the best thing that could have been done under the circumstances in order to keep the walls up.

His Honour asked if the buttresses had fallen away from the brick walls.

Mr. Roberts: I have examined the walls, and can't see any indication of that.

His Honour: I have looked at them myself, and can't find any indication.

In answer to another question, Mr. Roberts said he did not think it was possible that the erection of the buttresses could have been caused by the movement of the roof.

After Mr. Bailhache had cross-examined the witness at length, the examination of witnesses for the defence was resumed.

Mr. Robert Pickwell, architect, Cardiff, said he examined the gymnasium on May 6 and 11. He explained the nature of the pressure of the roof, and said there was no outward pressure below the tie rods. The buttresses did not make the slightest difference to the stability of the building, and if the gymnasium was his he should not have the slightest hesitation in removing them. He did not think the buttresses were necessary, but considered it a great mistake to put them there. The buttresses on the north side were about an inch out of plumb. The buttresses had not broken away from the walls, but had taken the walls with them. Witness further said that the buttresses did more harm than good. They never had any business to be put there. He thought the pine-end wall was of sufficient thickness. Replying to his Honour, he said it was a fallacy to think that the roof was not strong enough for trapeze performances. It was like a fly on an elephant's back.

Mr. A. O. Watkins was the next witness. He stated that the cracks in the building were caused by the process of

drawing the walls together. When the work was done the walls were whitewashed over. As cracks they were very small. They showed more now than before as the dirt had got into them. The cracks had not got any worse. Blue clay foundations were one of the worst obtainable, and necessitated elaborate precautions as to the artificial foundations. He should expect a settlement in new work.

Cross-examined: When the original building was put up it was expected to settle. As to the cracks spoken of, new ones could not be discerned so quickly as old ones.

Mr. E. H. Bruton, architect (Cardiff), deposed that he went over the gymnasium. Generally speaking, he agreed with Mr. Pickwell's evidence. He believed the cracks, being on the top of the wall, did not affect the building at all.

His Honour: Not if they go through the wall?

Witness: Not even then. He had frequently found cracks in slight walls like this. He thought the building before the buttresses were put up was safe.

His Honour: Would you like to perform on the trapeze?

Witness replied that he would not object. The trapeze could not have any real effect on the stability of the structure.

Cross-examined: The collapse showed a distinct weakness somewhere. (The witness fainted while in the witness box, and was shortly afterwards removed from the court.)

Mr. Dyne Steel stated that he made an examination of the gymnasium quite recently. The building, apart from the buttresses, was safe and proper.

Cross-examined: The building must have been weak or it would not have collapsed. He did not call it a weak roof. The weak part were the walls between the piers.

Mr. S. W. Allen (engineer), Cardiff, stated that the buttresses were quite unnecessary.

Mr. J. D. Whittaker (Newport) deposed that the building of the buttresses would account for the slips in the wall. He saw some cracks in the top of the wall, but they were of no serious consequence. As to the buttresses, even if they were required they were wrongly constructed.

Cross-examined: The committee of the club were badly advised. The buttresses were worse than useless; they did harm. With reference to the cracks, there were very few buildings without them.

Mr. Bailhache then addressed the Court. He urged that the club sought to put on Mr. Watkins all sorts of liabilities which he never undertook by the agreement of March 21, 1890. Mr. Watkins was being pressed more than he ought to be. Mr.

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Watkins had absolutely discharged his liabilities under the agreement. The only structural defect to consider was as to whether the walls had bulged out since the building was handed over. The walls did not go out until the buttresses were put down.

Mr. Hornby submitted that if his Honour was satisfied that when defendant handed over the building there was any defect, there was a breach of the contract. Assuming that there were defects, the plaintiffs were bound to do something to remedy the defects. This being done, the defendant was liable.

His Honour, in giving judgment, said that if a man gave a contract to have a house built he was entitled to have the walls straight, and no cracks in them. The defects in the walls were in existence before the buttresses were erected. Upon the whole of the evidence he thought the plaintiff was entitled to recover. He gave judgment for 60% and the usual costs.

AMERICAN BUILDERS.

THE seventh convention of the National Association of Builders of the United States has been held at St. Louis, Missouri, under the presidency of Mr. Alexander Ittner, of St. Louis. In the course of his address, he said :—

Our association is now assembled in seventh annual convention ; Chicago, Cincinnati, Philadelphia, St. Paul, New York, Cleveland, and now St. Louis, in the order named, are the cities that have been successively honoured by your presence. It is my pleasant privilege to speak in a general way of some of the good things accomplished since the organisation of our association. There cannot now be any question among well-informed and unprejudiced persons concerning the foresight and wisdom of its founders. To question proper and intelligent organisation and co-operation among those in any line of calling, whose interests are kindred and mutual in their nature, can only be accounted for through ignorance or prejudice, as, to do so, is to call into question the very fundamental principles upon which society and our government are founded. Our methods are open, manly and just, we transact our business with open doors, in the full light of the noonday sun, and our proceedings are recorded and printed in full, so that they can be witnessed and read by all who may have a desire to do so—in fact, we take special pleasure in furnishing any information that may be desired concerning our organisation to anyone who may apply for same.

The results of our deliberations are merely recommendatory, and are submitted to the filial bodies composing this association and to the trade generally, in order to bring about uniformity of methods and practices with a view to the general betterment and well being of all concerned, and for the purpose of creating and perpetuating a proper and friendly feeling between employer and employe. It is in no self-laudatory spirit, but rather as a fact, that I assert that no man who has witnessed our proceedings and the personnel of our membership can go away without being favourably impressed with both, and I presage for our association length of days and a great future that must ultimately place it in the fore-front of national bodies ; in fact, I go further, and predict the day (perhaps not in our time), when we shall assume an international character by meeting in joint assembly the brightest minds of the old world and exchanging with them ideas of the greatest benefit to both hemispheres ; and in this way enlarge the scope of our usefulness. I am in such full sympathy and hearty accord with many of the principles enunciated by our association at its first annual convention in Chicago, that I hope to be pardoned for reproducing some of them and making them part of my address.

In your Declaration of Rights you say :—" This association affirms that absolute personal independence of the individual to work or not to work, to employ or not to employ, is a fundamental principle which should never be questioned or assailed ; that upon it depends the security of our whole social fabric and business prosperity, and that employers and workmen should be equally interested in its defence and preservation. While upholding this principle as an essential safeguard for all concerned, this association would appeal to employers in building trades to recognise that there are many opportunities for good in associations of workmen ; and, while condemning and opposing improper action upon their part, they should aid and assist them in all just and honourable purposes. That while, upon fundamental principles, it would be useless to confer or arbitrate, there are still many points upon which conferences and arbitrations are perfectly right and proper, and that upon such points it is a manifest duty to take advantage of the opportunities afforded by associations to confer together, to the end that strikes, lock-outs and other disturbances may be prevented. When such conferences are entered into, care should be taken to state clearly, in advance, that this fundamental principle must be maintained, and that such conferences should only be competent to report results in the form of resolutions

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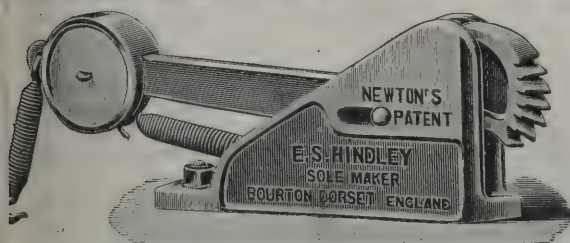
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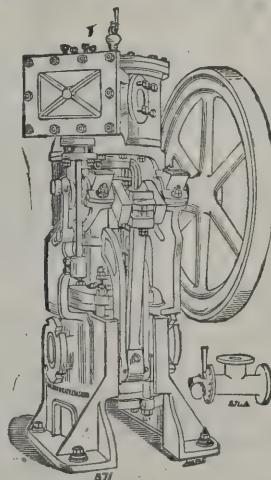
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of recommendation to the individuals composing the various organisations participating, avoiding all forms of dictatorial authority." This reads well, and after a lapse of six years, I take it, there is nothing contained therein that you would care to modify or expunge, nay, on the contrary, every word and syllable it expresses is something to be proud of and you may well congratulate yourselves that such is the record.

I now ask your attention to the leading paragraph in your Constitution, which you will agree with me dovetails nicely with the paragraph just read from your Declaration of Rights. It is as follows:—

"Article II.—The fundamental objects of this association shall be to foster and protect the interests of contractors, workmen, and others concerned in the erection and construction of buildings; to promote mechanical and industrial interests; to acquire, preserve and disseminate valuable information connected with building trades; to devise and suggest plans for the preservation of mechanical skill through a more complete and practical apprenticeship system; and to establish uniformity and harmony of action among builders throughout the country. The better to accomplish these objects this association shall encourage the establishment of Builders' Exchanges in every city or town of importance throughout the country, and shall aid them to organise upon some general system that will not conflict with local customs and interests, in order that through these filial associations the resolutions and recommendations of this National Association may be promulgated and adopted in all localities."

I trust you will agree with me that the magnitude and importance of these fundamental principles and declarations of your national body were sufficient justification for their repetition as a part of my address; thereby hoping to familiarise the public more and more with our objects and purposes, and in this way to secure the approbation and esteem of the people of our common country, and at the same time to increase our usefulness and importance.

There were also recommended at your first Convention "the adoption of a uniform system of apprenticeship by the various mechanical trades;" "that manual training schools should be established as a part of the public school system, and that trade night schools should be organised by the various local trade organisations, for the benefit and improvement of apprentices;" also a system of payment by the hour for all labour performed, other than "piece" and "salary work." A uniform contract was recommended, which has since been

adopted, and is now generally used throughout the country. This was brought about through a joint committee of the American Institute of Architects, the Western Association of Architects and of the National Association of Builders. Since your last Convention at Cleveland, Ohio, this contract has been amended, and will be submitted to you in its present shape by your committee, of which Mr. George C. Prussing, of Chicago, is chairman.

On the subject of trade schools and apprenticeships we have great cause for congratulation. Colonel R. T. Auchmuty, of New York, who is the pioneer of trade schools in this country, has been encouraged in his good work by a munificent voluntary gift of a half million dollars by J. Pierpont Morgan of New York. When we consider how deeply Colonel Auchmuty's heart is engaged in this work, and that his remaining days are dedicated to its service and advancement, we can appreciate the feeling of gladness and rejoicing that possessed his very being when the knowledge first came to him of this princely gift. Colonel Auchmuty came to me in our convention hall in New York, having learned that we were then agitating the establishment of a trade school in our city, under the auspices of our Exchange, and voluntarily offered a contribution of 1,500 dols. a year for three years, in case we should succeed in starting a trade school here. I thanked the colonel from the bottom of my heart for his generous offer, and knowing what he was then doing for the Philadelphia Trade School, and the great responsibility he had on his hands in his own school, which I understood was being maintained entirely at his own expense, I remarked to him that he was doing himself an injustice; that the impulses of his big heart would lead him to take upon himself a greater load than he could carry. His answer to this was, "Mr. Ittner, I have not got many years to live and I desire that the remainder of my days shall be spent in the interest of the 'American boy.'" All honour to Colonel Richard T. Auchmuty, of New York. I desire to say in this connection that I felt it a duty incumbent upon me to write to J. Pierpont Morgan, of New York, thanking him on behalf of the National Association of Builders and in the interest of the "American boy" for his noble gift in aid of Colonel Auchmuty's Trade School, and I feel sure that you will approve and endorse that action. We still receive very flattering and encouraging reports from the trade school established under the auspices of the Builders' Exchange of Philadelphia. I regret to be compelled to report that as yet nothing definite has been done toward the establishment of a

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trade school in this city, but I feel justified in saying that the project is not abandoned by any means; there are those among us who, with half encouragement, will take it up and inaugurate the system, and, once under way, I have no fear of its final success.

It affords me much pleasure to be able to report for the information of the Convention that a system of apprenticeships, or miniature trade schools, has been in vogue for some time in this country, in other than the building trades, principally in iron foundries, in the stove and hollow ware moulding business. I have letters from those who have the system in successful operation, which I would be glad to present to the Convention should the discussion upon this subject during your deliberations call them out. I hope and pray for the day to come when no "American boy," with the spirit and ambition within him to advance his condition and become a skilled workman, will be debarred the privilege of doing so. As well might we shut out the sunlight of heaven, and withhold the air and water from a portion of God's children, as to place arbitrary restrictions upon a portion of the same family, that would debar them from becoming skilled artisans. There will always be drones enough from choice, or I might say from want of ambition or desire to advance in the world, and from untoward circumstances, to do the drudgery. This class is at present largely in the majority, or unskilled labour would not be working to-day for one-half and in many cases for one-fourth, and in rare instances for one-tenth of what is being paid to skilled labour. There is no just reason to be advanced why the difference should be so great.

There is a dearth of skilled labour in all branches of industry, largely if not altogether due to the proscription of the apprenticeship system by the organised labour associations of the country. Having laboured from boyhood, and having served and had the advantages of an apprenticeship in two different trades, I have the greater reason to sympathise with those who are so unfortunate as to be debarred the advantages of any trade at all. There is also a feeling of disappointment in the contemplation of the thought that free American mechanics, in a free country, should encourage restrictive and arbitrary rules by which American boys are deprived of the advantages of trades and of becoming skilled workmen. There is a sadness in the reflection that a father would favour methods by which his own son is prevented from learning the trade of his choice. The wrong would indeed be deplorable if there were not an outcome resulting in good, in the shape of the trade school and

which will ere long supply the want, and also mark a vast improvement on the old system.

Mr. President Tucker, at our fifth Convention in New York, made brief mention concerning a subject that is receiving more or less attention from the business world. I refer to profit-sharing, which I deem of sufficient importance and merit for your careful consideration, and would recommend that the matter be entertained and sent to one of your standing committees, or, if you think best, have it go to a special committee; also that more full and accurate statistics be encouraged, by and through the filial bodies composing this association, so that we may be enabled to arrive at a more complete knowledge of the vastness and importance of the building industry in this country; likewise to encourage through the same channel perfect building laws and ordinances governing the proper construction of buildings in cities, where such do not now exist, and that experienced and competent practical builders be selected as commissioners to supervise their construction. It is to be hoped that the uniform style of contract, as revised and amended during the year, will now come into more general use, and that many wrongs and inequalities, so aptly referred to in President McAllister's last annual address, heretofore imposed upon the contracting builders, will cease. The relations existing between the architect and the builder should be friendly and sincere in their nature. The former can do full justice to his client without necessarily doing an injury to the builder, and in case the builder renders an honest compliance with the terms of his contract, he should not be asked to do more.

Such magnificent exhibitions of skill and speed would astonish the builders of old, could they, after the lapse of centuries, come forth from their grave and view these grand structures. They would surely stand spellbound with wonder and awe at the mighty progress and skill of the builder of to-day (as compared with the time in which they "lived and moved and had their being"). Nor has the state of the art, as yet, by any means reached perfection. Arguing from the history and experience of the past, we are justified in the conclusion that it is susceptible of still greater improvement.

Architecture in this country, as it is to be seen and admired at the World's Columbian Exposition in Chicago, has reached its most advanced state, and, as one having had the privilege of witnessing its beauty and grandeur on the occasion of the formal opening in October last, I feel justified in saying that it does great honour to the profession, and my sincere wish is

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that every American citizen, with any taste for art and love of the beautiful, might have the opportunity to view the beauty of outline of the many buildings within the World's Fair enclosure.

It is, indeed, with a sad heart that I announce the death, during the past year, of Marc Eidlitz, of New York, one of the charter members of our association, and a man whom to know was to respect and honour, and whose person and presence gave tone and dignity to any body of which he was a member. So far as I am at present aware, the only solemn and painful duty you will be called on to perform during this session is to formulate appropriate resolutions of respect to his memory.

While it is our wish to have this, the seventh annual Convention, known as a business meeting, it is not our purpose to depart from or omit any of the pleasant customs and enjoyments that have uniformly been observed on previous occasions of this sort, and which serve to make us better acquainted with each other, and thus increase our advantages and usefulness as members of the association.

While, as I am disposed to believe, we may have plenty of work to do in the consideration of propositions suggested at previous Conventions, we will still be glad to receive new thoughts and matters to be acted upon at the present session, if the time will permit, or to be submitted and referred to appropriate committees to be reported and acted upon at a future meeting.

The World's Columbian Exposition at Chicago marks unparalleled advancement in architecture and building compared with its status as exhibited at the Centennial Exposition at Philadelphia in 1876.

I think it is no stretch of the imagination to say the progress made in the intervening seventeen years far exceeds the progress of our entire previous history as a nation.

No one who has not heretofore or who may not hereafter visit the Exposition, and witness with his own eyes the magnitude and grandeur of the graceful and stately structures that there meet the eye on every hand, can possibly credit my statement, and it is upon this account that I urge upon every American citizen who loves his country and prides himself upon its advancement and glory, to spend his last dollar if necessary, even to pawning his watch, if he has one, in order to raise the money to visit the World's Fair and behold its beauties. The time will be profitably spent, and he who goes will thereafter feel himself more a man and cherish a stronger

feeling of pride for his country and its citizenship. Yes, by all means, and under any and all circumstances, let everyone who can visit Chicago, and cross the threshold of a new world in science, art and manufactures. I trust I may be excused for the further reference to this subject, but I feel its importance sufficient justification.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C. from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

9144. William Kincaid and Arthur Heaton, for "Window-sash regulator for all kinds of windows, either railway carriage or house, also acts as burglar alarm."

9239. Richard William Slade, for "Improvements in instruments for measuring, gauging and comparing distances."

9332. Messrs. Robert Kerr & Sons (Andrew Kerr, Robert Kerr, William Kerr and John Kerr), and Andrew McFadyen, for "Improvements in machines for forming dovetails in wood-work."

9417. William Reuben Lane and Henry John Chamberlain, for "Improvements in securing door and other knobs to their spindles."

9482. Henry Thomas Johnson, for "Improvements in ventilators."

9579. John Malcolm Shepherd, for "Improvements in lifts."

9591. Hubert Polte, for "Automatic guide for rolled-wire and fine iron bars."

9595. Harry Richmond Chubb, for "Improvements in taps, cocks, or valves for domestic, sanitary and other purposes."

9651. Johann Ludwig Lenert, for "A new or improved cowl for chimney and ventilating shaft tops."

9544. Valentin Olzer, for "Improvements in locks for doors and the like."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

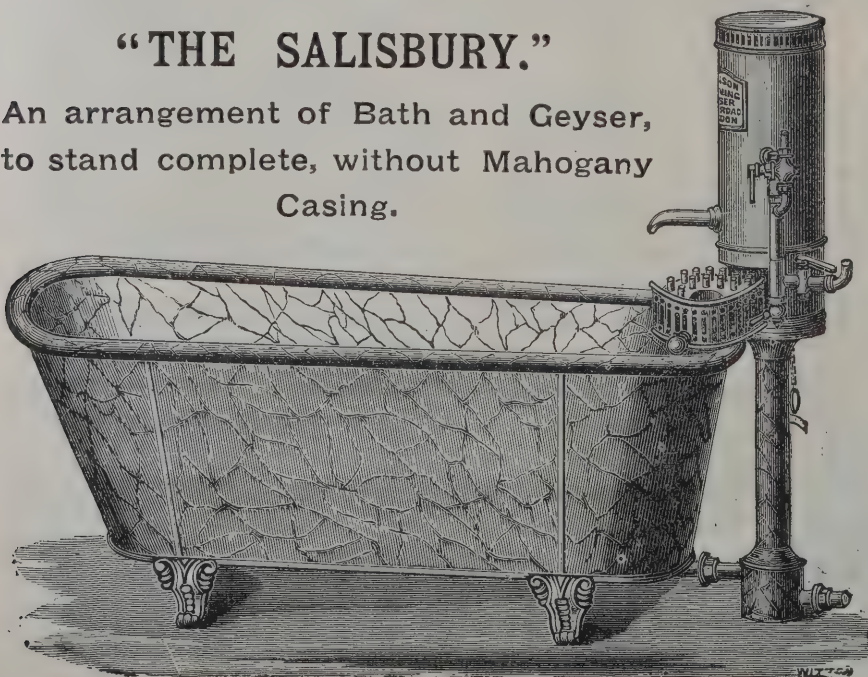
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(Machinery Section).

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TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

DARLINGTON.—Designs are invited for Municipal Offices. Borough Surveyor, Town Hall, Darlington.

MONMOUTH.—July 1.—Premiums of 30 and 20 guineas are offered for schemes for Disposal of Sewage. Mr. T. R. Oakley, Town Clerk, Monmouth.

ROCHESTER.—June 26.—Designs are invited for the Sewerage of the Village of Borstal. Premiums of 25 Guineas and 10 Guineas. City Surveyor, Guildhall, Rochester.

ST. HELENS.—July 24.—Designs are invited for Public Library and Technical School. Premiums of 100l., 50l. and 25l. W. J. Jeeves, Town Hall, St. Helens.

WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50l. and 25l. Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10l. Mr. Horatio Brevitt, Town Hall, Wolverhampton.

CONTRACTS OPEN.

ABERLECHAU.—June 7.—For Building Board School for 84 Children. Mr. A. O. Evans, Architect, Market Chambers, Pontypridd.

BIDEFORD.—June 14.—For Constructing Filter Beds at Waterworks. Mr. B. Latham, 13 Victoria Street, Westminster.

BRIGHTON.—June 9.—For Building Shop and Store. Mr. F. J. C. May, Town Hall, Brighton.

BUDLEIGH SALTERTON.—June 7.—For Construction of Pumping Station and Reservoir, also Pumping Machinery, Providing and Laying Cast-iron Pipes, &c. Mr. J. M. Martin, Engineer, Bradninch Place, Exeter.

BURSLEM.—For Building School. Mr. A. R. Wood, Tunstall.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CHELMSFORD.—June 12.—For Building Warehouse, Show-room, Offices and Shops. Mr. F. Chancellor, Architect, Chelmsford.

CHELTEMHAM.—June 7.—For Building Chapel. The Secretary, The College, Cheltenham.

CHISWICK.—June 7.—For Constructing Sewers and Making-up Roads. Mr. A. Ramsden, Vestry Hall, Turnham Green, S.W.

CROYDON.—June 6.—For Repairing Roads. Borough Surveyor, 8 Katharine Street, Croydon.

EAST MOLESEY.—June 21.—For Constructing Sewers, Building Engine and Boiler-houses, Precipitation Tanks, &c. Mr. J. C. Melliss, 232 Gresham House, Old Broad Street, E.C.

HANLEY.—For Building Business Premises. Mr. Larner Sugden, Architect, Leek.

HANWELL.—June 12.—For Sewering and Making-up Roads. Mr. S. Barnes, Local Board Offices, Hanwell, W.

HORNCastle.—June 10.—For Decorating Chapel. Mr. J. Chatterton, Spilsby Road, Horncastle.

KENDAL.—June 6.—For Additions to Town Hall. Mr. S. Shaw, Architect, Kendal.

KINGSLEY.—June 10.—For Building School and Alterations to present School. Mr. Larner Sugden, Architect, Leek.

LEICESTER.—June 24.—For Two Triple Expansion Pumping Engines. Mr. J. B. Everard, Engineer, 6 Millstone Lane, Leicester.

LONDON.—June 9.—For Supplying and Fixing Wood and Stone Working Machinery. Mr. H. De la Hooke, County Council, Spring Gardens, S.W.

MOULSFORD.—June 16.—For Building Isolation Hospital. Mr. E. T. Hine, Architect, 35 Parliament Street, Westminster.

NENAGH.—June 6.—For Building Parish Church. Mr. Walter G. Doolin, M.A., Architect, 20 Ely Place, Dublin.

ORSETT.—June 7.—For Constructing Stoneware and Iron Pipe Sewers. Messrs. C. & F. H. Jones, 25 Parliament Street, Westminster.

ROCHESTER.—June 15.—For Supplying Tooled York Stone Paving. Mr. W. Symms, 58 High Street, Rochester.

ST. ALBANS.—June 6.—For Building Police Station. Mr. A. H. Debenham, Town Clerk.

ST. HELENS.—June 14.—For Building Two Pavilions at the Isolation Hospital. Mr. G. J. C. Brown, Town Hall, St. Helens.

SOUTHEAD-ON-SEA.—June 7.—For Supplying and Laying Coarse Tar Paving. Mr. C. T. Copley, Borough Surveyor, Clarence Road, Southend.

SOUTHWARK.—June 15.—For Building Casual Wards. Messrs. H. Jarvis & Son, Architects, 29 Trinity Square, Borough, S.E.

STOKE-ON-TRENT.—June 6.—For Alterations and Additions to Schools. Messrs. R. Scrivener & Sons, Architects, Hanley.

STONE.—June 12.—For Building Kitchen Boiler, Chimney Stack, Bathroom, Lavatory, &c., at Workhouse. Mr. J. J. Chapman, Architect, Walton, near Stone.

SWANSEA.—June 12.—For Laying Brick and Iron Pipe Sewers. Mr. J. Thomas, Guildhall, Swansea.

TUNSTALL.—For Supplying Blue Paving Bricks, Macadam Stone Setts and Kerbs. Mr. A. R. Wood, Town Hall, Tunstall.

TUNSTALL.—June 8.—For Making Up Streets. Mr. A. R. Wood, Town Hall, Tunstall.

WALTHAMSTOW.—June 3.—For Additions, &c., to The Chesnuts. Mr. W. P. Gepp, Chelmsford.

WATFORD.—June 3.—For Widening and Part Reconstruction of Bridge. Mr. Urban A. Smith, Hertford County Surveyor, 26 Victoria Street, S.W.

WESTMINSTER.—June 21.—For Constructing Underground Convenience, Laying Wood Paving and Asphalte, and Building

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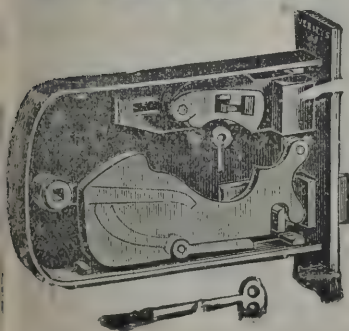
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Stabling and Dépôt. Mr. G. R. W. Wheeler, Town Hall, Westminster.

WICKHAM BISHOPS ASYLUM.—June 3.—For Trial Well Borings. Mr. W. P. Gepp, Chelmsford.

WISBECH.—June 3.—For Building Water Tower, Providing Wrought-iron Tank, Girders, &c. Messrs. Easton & Co., Engineers, 11 Delahay Street, Westminster, S.W.

YNYSYBWL.—June 7.—For Building Board School for 158 Children. Mr. A. O. Evans, Architect, Market Chambers, Pontypool.

TENDERS.

BOSCOMBE.

For Proposed Police Station, Boscombe. Mr. JAMES ROBINSON, County Architect, 13 Southgate Street, Winchester.

F. Walden, Bournemouth	£3,734	0	0
Enwistle & Co., Bournemouth	3,500	0	0
F. Hoare & Sons, Bournemouth	3,400	0	0
E. Bath & Co., Bournemouth	3,385	0	0
J. W. LUCAS, Bournemouth (accepted)	3,195	0	0

BRIGHTON.

For Erection of Higher Grade Schools at York Place, Brighton, for the Brighton and Preston School Board U.D. Mr. THOMAS SIMPSON, 16 Ship Street, Brighton, and Mr. JOHN W. SIMPSON, 10 New Inn, Strand, W.C., Joint Architects.

Bishop & Co., Shoreham	£17,662	15	0
Kilby & Gayford, London	16,730	0	0
Mid-Kent Building Co., Beckenham	16,652	0	0
W. Wallis, Balham	15,957	9	0
J. T. Chappell, London	15,594	0	0
J. Longley & Co., Crawley	14,875	0	0
P. Peters, Horsham	14,767	0	0
C. J. Slade, Maidstone	14,601	9	6
W. TAYLOR, Brighton (accepted)	13,926	17	0

BURNHAM.

For Alterations at the Star Hotel, Burnham, for the Chelmsford Brewery Company (Limited). Mr. C. PERTWEE, Architect.

J. Gozzett, Maldon	£205	0	0
T. J. Stammers, Southminster	195	5	0
CHARLES READ, Burnham (accepted)	189	0	0

BLAENAVON. MON.

For the Erection of Workmen's Institute, Blaenavon. Mr. E. A. LANSDOWNE, Architect, National Bank of Wales Chambers, Newport, Mon.

JOHN MORGAN, Blaenavon (accepted) £5,692 0 0

BURTON-ON-TRENT.

For Building Wesleyan Church, Woodville, near Burton-on-Trent. Mr. A. THOMPSON GREENWOOD, Architect, Woodville, Burton-on-Trent. Quantities by Mr. W. HOFFMAY WOOD, 14 Park Square, Leeds.

E. Fox, Leicester	£4,248	0	0
Varlow, Burton-on-Trent	4,000	0	0
T. Lowe & Sons, Burton-on-Trent	3,890	0	0
W. Edwards, Woodville	3,605	0	0
Walker & Slater, Derby	3,565	0	0
Brooks, Woodville	3,496	2	6
W. Moss, Coalville	3,433	0	0
E. Clarke, Melton Mowbray	3,295	0	0
G. Hodges, Burton-on-Trent	3,290	0	0
Gee Bros., Burton-on-Trent	3,256	0	0
J. & T. W. Selby, Burton-on-Trent	3,238	0	0

CROYDON.

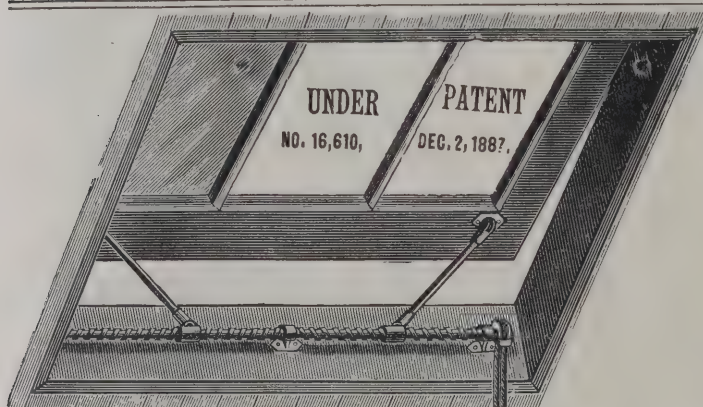
For Building Premises at back of Nos. 6, 8, 10 and 12 North End, Croydon, for Mr. J. Allder. Mr. ALFRED BROAD, A.R.I.B.A., Architect, 27 Dingwall Road, Croydon. Quantities by the Architect.

Bowyer & Son, Norwood	£2,390	0	0
D. W. Barker, Croydon	2,327	0	0
W. Marriage, Croydon	2,280	0	0
Batley & Linfoot, Croydon	2,195	0	0
J. Smith & Sons, Norwood	2,173	0	0
A. Bullock, Croydon	2,149	0	0
E. P. Bulled & Co., Croydon	2,080	0	0
M. Taylor, Croydon	2,062	0	0
E. J. Saunders, Croydon	2,021	0	0
G. E. BRYAN & SON, Norwood (accepted)	2,008	0	0

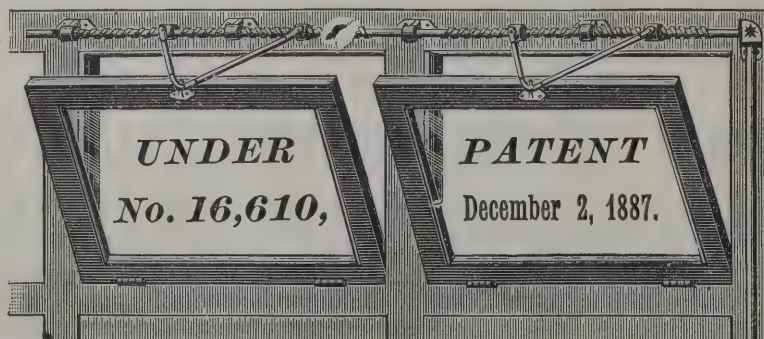
DURHAM.

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Mr. JNO. HENRY, Architect, Durham.			
W. & R. Blackett, Bishop Auckland, bricklayer	£620	0	0
J. Whaley, Durham, carpenter, &c.	350	0	0
T. Nesbitt, Durham, plasterer	88	7	0
Heron & Brown, Durham, plumber, &c.	74	5	0
T. Blakey, Durham, slater	60	14	4
T. Hopper, Durham, glazier and painter	27	2	5



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Porter & Co., Lincoln	268	10	0
Tattersall & Sons	265	0	0
R. & J. Dempster, Newton	256	0	0
E. White, Redditch	245	0	0
R. Dempster & Sons, Elland	240	0	0
W. C. Holmes, Huddersfield	220	0	0
Park Lane Co.	215	0	0
NEWTON, CHAMBERS & Co., LIM. (accepted)	191	0	0
Eagle Foundry Co., Aberystwith	160	0	0

HASTINGS.

For Construction of Roads and Sewers, Barley Lane Estate, Hastings, for Mr. H. H. Hewlings. Messrs. F. & J. PLOWMAN, Architects, 35 Havelock Road, Hastings.

Coker, Halling, Rochester	£3,250	0	0
Neave & Son, Paddington	2,980	0	0
Trueman, Swanley	2,960	0	0
Cattell, London	2,726	0	0
Catley, Lloyd Square	2,450	0	0
Piper & Son, Hastings	2,387	16	4
Wheeler, Southwark	2,379	0	0
MARCHANT, Hastings (accepted)	1,925	0	0

HESSLE.

For Building Police Station at Hesse. Mr. A. BEAUMONT, County Surveyor, Beverley.

B. Nicholson, Hull	£1,663	5	0
G. Jackson & Son, Hull	1,620	0	0
F. Blackburn & Son, Hull	1,537	18	0
G. F. Tasker, Hesse	1,475	0	10
Colley & Levett, Hull	1,473	0	0
R. Potts, Beverley	1,466	5	0
G. & R. Pape, Beverley	1,420	0	0
Jackson Bros., Goole	1,415	0	0
A. Moore, Scarborough	1,385	0	0
F. W. Thompson, Hull	1,346	2	9
E. Frost, Hesse	1,325	11	0

Amended Tenders.

Thompson	1,265	14	2
FROST (accepted)	1,224	1	3

HANLEY.

For Additions, &c., to Relief and other Offices, Hanley, for the Guardians. Messrs. R. SCRIVENER & SONS, Architects, Hanley.

C. Cornes, Hanley	£175	0	0
Ogden & Banks, Hanley	175	0	0
Steadman & Silvester, Hanley	166	15	0
J. P. Clarke, Hanley	153	0	0
T. Godwin, Hanley	148	0	0
G. ELLIS, Hanley (accepted)	140	0	0

HORSELL.

For Structural Alterations to Stabling at Heathlands, Albany Road, Horsell Grange Estate, Woking, Surrey, for the National Land Corporation, Limited. Messrs. POOLEY & FOLLETT, Architects, 21 John Street, Adelphi, W.C.

Quantities supplied by Architects.			
S. Chafen, Deptford	£156	7	0
H. INGRAM & SONS, Woking (accepted)	155	0	0
For Decorative Repairs to Heathlands, Albany Road, Horsell Grange Estate, Woking, Surrey, for the National Land Corporation, Limited. Messrs. POOLEY & FOLLETT, Architects, 21 John Street, Adelphi, W.C.			
E. Bissell, Woking	£116	13	6
R. PAIN, Woking (accepted)	81	15	0

HULL.

For Building Stabling, &c., Little Goodwin Street. Mr. JOHN W. L. WHITFIELD, Architect, Chancery Buildings, Hull.

Quantities by Architect.			
R. Bevers, Hull	£893	10	0
Jackson & Son, Hull	867	10	0
F. Hall, Hull	854	0	0
J. Drury, Hull	845	10	0
F. Southern, Hull	835	15	0
J. Habbershaw, Hull	835	0	0
Simpson & Son, Hull	828	6	0
G. Houlton, Hull	825	0	0
T. Kendall, Hull	824	12	0
Colley & Levett, Hull	805	0	0
M. Harper, Hull	803	10	0
BLACKBURN & SON, Hull (accepted)	798	0	0

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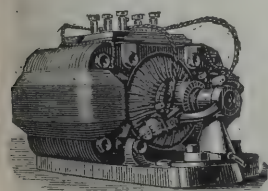
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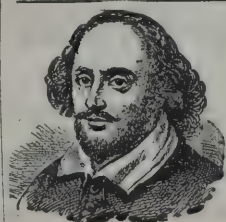
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IN this paper on school buildings I shall not try to cover the field, but simply speak of the growth of the science of education, for the accommodation of which school buildings are erected, and then treat of the requirements of a modern

* A paper read by Walter S. Pardee at the Annual Convention of Building Inspectors and Commissioners, at St. Louis.

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school building from the standpoint of an architect and a sanitarian, giving also some of the prevailing opinions on the subject. In the olden time, and in the warm countries where teachers and scholars first assembled, school buildings were of minor importance. The transmission of ideas from teacher to pupil, education itself, pure and simple, was the chief occupation.

Let it not be understood that there was little done in education during the centuries that just preceded the dawn of the modern era. Passing over the work done by the ancient Oriental, Greek and Roman nations, we may briefly say that the European nations, from the eleventh century onward, possessed tens of thousands of earnest teachers and scholars. From this date hundreds of universities, with their colleges and academies, came into being, and the characters of the learned and great were there moulded.

The revival of learning, beginning in the eleventh century, continued in an increasing proportion through the Middle Ages, and is increasing still faster to-day.

In the fifteenth century, when the Renaissance of learning had become almost universal, there were as many as 30,000 students in one university, that of Paris, and there were proportionately large numbers at many other universities of the time.

At first there were no common schools, the rich and the noble only being able to get an education.

Organisation, and especially Government control, were not marked features of the earlier institutions. The first school was simple and instructed in but a few subjects. Later came academies, then colleges, then groups of colleges called universities.

For a long period there was much groping in darkness, and it remained for the present century to perfect organisation, combine conflicting interests and approach more nearly to that harmonious and effective union that shall eventually bring about the education of the world.

The number of persons who have come under the influence of educational facilities since the eleventh century is incredibly large, tens of millions and more, and of course it is evident that the mental quality of these persons is far above the average. It may be said that they represent the cream of the earth. They are the ones that have moulded the world's thought, are doing it to-day and always will do it.

It is an unfortunate circumstance that those so valuable in the world, those whose bodily strength and mental vigour are

so necessary to the world's welfare, should have acquired their education, should have been fitted for their life work amid surroundings so ill-adapted to the preservation of bodily health.

The purpose of a good school building is to preserve and enhance the bodily health of the student, while he endures the fatigues of study; but alas! for the health of the students that have gone before. School buildings there were, sanitary they were not, and many a student paid for this lack with his life.

Of course, it should be our duty to see that this lack no longer exists. Along with the rest of our knowledge we should know the essential facts about school sanitation. It is needless to say that we are not fully awake to the requirements, and notwithstanding the fact that our predecessors have suffered so severely, thousands of students to-day are paying the penalty of ignorance or carelessness on matters of sanitation, sometimes with impaired health, sometimes with life itself.

More than that, thousands of children who are not old enough to know what is killing them are allowed to inhabit unsanitary school buildings. The consequences of this last evil are far-reaching, and, like most modern evils, this one is hard to overcome, because we are apt to fancy that such things cannot exist in the nineteenth century.

Years ago children did not go to school and adult students were better able to stand bad sanitation; but now millions of children are cooped in close schoolrooms without proper air and amid other unsanitary surroundings.

Few know the awful extent of this evil, and few are willing to know it. However that may be, it is a fact that a greater number of students, old and young, are being sacrificed to bad sanitation than ever before, in spite of the ignorance of our ancestors. Further, the confinement of our young students in such a way is surely and rapidly telling on the general vigour of the nation. Nor is this to our shame, since it is quite possible, at reasonable cost, to build school buildings that shall be practically perfect in point of sanitation. True, there is no school building yet devised that contains all the good things, and there are many points still under discussion by intelligent engineers.

As to the requirements of a sanitary school building and one best suited to the needs of children, say a common school of twenty rooms: First, it should be as nearly fireproof as practicable. Children do not have the strength and experience of adults and cannot look out for themselves. If it cannot be

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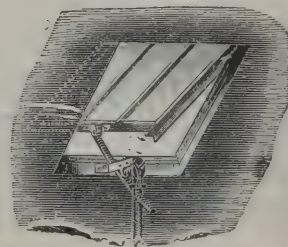
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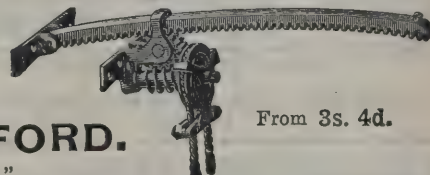
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The sanitary school building should be well lighted. This matter has received considerable attention from scientific men. It is claimed that an ideal system would bring in the light from the top of the room and distribute it equally throughout. Many object to this because it appears prison-like; besides in a building with one room over another it is impracticable. Schoolrooms being generally lighted from side windows it becomes a question as to number and location. It is conceded that the light should enter as near the ceiling as possible, therefore windows reach to the ceiling or nearly so.

It has been customary to follow the rule that light should come over the left shoulder, so as to avoid a shadow on the desk from the right hand; but while this is a good rule it is found hard to apply it where several pupils are together, as in a schoolroom, since that which will be left-shoulder light for one pupil will not be for some other. In practice an average is struck, and the windows so placed as to properly accommodate the greatest number. With windows on one side only about one-half the pupils get the left-shoulder light in some degree when they sit with the left side to the windows. The other half gets the light chiefly in the left eye, or more in the left than in the right. That is a bad arrangement and prolific of unequal vision. This can in some degree be lessened by placing the side windows well toward the rear, and placing some on the rear as well. There is then, however, the objec-

tion that the pupils in the diagonal corner furthest from the light are too much in the dark.

In a room lighted wholly from one side and the pupils placed with back to the light some curious facts are noticeable. First, the same number of pupils receive left-shoulder light, as in the former case—that is, one-half; the other half receives the light over the right shoulder, not a desirable thing and not to be tolerated unless there is enough reflected light to dissipate the shadow cast by the right hand on the desk. If there can be such reflected light, and there is no doubt about that, it gives the best light I know of for so many pupils, since as many get left-shoulder light as in the other way, and none of them get it partly in front. That this is the best arrangement for the pupils I think there can be no question, though upon the teacher it is especially hard, though it may be said that the teacher can always move about, while the pupils must stay where they are.

I think it is common to put some windows on the side and some on the end of each room, where it can be done, though I am inclined to think the side light the better, if it could be properly curtained and managed by the teacher. Whatever the position of windows there should be plenty of them.

The sanitary school building must be well heated and ventilated. These two things can be considered together, though heating alone used to be the first and only consideration. The requirements call for the right amount of fresh air and heat, properly introduced to the rooms and circulated therein. Economy seems to call for a central plant for the supply. One of the main difficulties to overcome after a good heating device has been provided is the proper inlet, exit and circulation of the ventilating air in the schoolroom. Unless this work be properly done the whole plant is a failure, and it is a fact that much confusion exists as to the method to be employed. The problem is made more difficult of solution because the atmospheric changes are so rapid and radical that no single arrangement of the working parts will answer for any certain time. Obviously the best way to have the air enter a schoolroom would be at openings all over the floor, and it should leave at a like number of openings in the ceiling. That way is not practicable where rooms are over one another, and therefore the common way of introducing air into the room is by a single and ample opening. It is let out by another. Where these inlets and outlets shall be placed with reference to each other and the room itself is a question in dispute. Much confusion obtains on this point—perhaps because people

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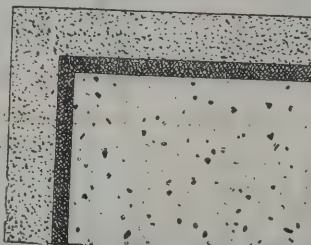
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believe it is possible to adjust the openings to suit all occasions. The question will be much nearer solution when this belief is eradicated. In some rooms the inlet will be found at the top and the outlet at the bottom; in others it will be the reverse. In some there will be inlets and outlets at both top and bottom; in others the inlet and outlet on the same side of the room. In others the inlet will be on one side and the outlet on the other.

Probably there will be confusion on this point so long as the single inlets and outlets are used.

We must have circulation through the room, and we get it in one of two ways. Either the air may enter cooler than the room, in which case, if the inlet is at the bottom and the outlet at the top, a fair circulation will be given; or the air may enter warmer than the room, when, if the inlet is at the top and the outlet at the bottom, a good circulation will be got.

Since it is a fact that air must sometimes enter warm and sometimes cool, so as to maintain the standard of heat, it will be seen that neither arrangement of openings will answer for both cases, and the working parts cannot be so fixed as to give perfect satisfaction. If both inlets and outlets are provided at top and bottom when cool air is wanted, the floor inlet and the ceiling outlet can be used. When warm air is wanted the ceiling inlet and floor outlet can be used. But aside from the difficulty of getting any one to understand it, it would take one person's time to watch the thermometer and manage the dampers. Present practice largely adopts the ceiling inlet and floor outlet, ignoring the fact that incoming cool air falls to the floor, and poor circulation is the result.

This intermittent lack of circulation is a grave difficulty and hard or impossible to be avoided when the inlet is high and the outlet low, more especially when a room is heated by air alone.

Some engineers try to prevent notice being taken of the difficulty by putting the inlet at or near the floor. When the air comes in warm it rises to the ceiling, distributes, cools and falls to the floor, leaving at the foul-air opening. Under these conditions the air appears to circulate properly, the only objection being a current of hot air striking the pupils. This current of air is made less noticeable by a screen; that is, of course, unnecessary when the inlet is above. On the other hand, with the inlet at the floor and the air coming in cool, there is and can be little or no circulation through the room, the air simply entering, flowing along the floor, and leaving at the outlet. This seems to be a case of out of sight and notice, out of

mind. The lack of ventilation is not easily discovered, and thus gives a fine chance for the professional quack to show off his system of ventilation, for with his air meter at the inlet and the outlet he finds the full volume of air passing that he guaranteed to furnish, and no one stops to inquire whether that air gets to the proper parts of the room by circulation.

I believe it would be a good system to heat the floors evenly and always bring the air in cool, provided that the floor heat could be controlled and unpleasant draughts prevented.

It is hard to say where the inlets and outlets should be placed to satisfy all conditions, but I have advocated putting the inlet high and the outlet low, though I am quite ready to change should a better way be found.

The general plant that is to furnish the heat and ventilation in a sanitary school building must be ample to do its work. It must be durable, cheap to put in and cheap to maintain. Furnaces furnishing hot air, steam plants and hot water plants, with numerous modifications and partial unions, are the principal kinds used in school buildings. For years the furnace did good duty, and it still holds its place, at least in the smaller class of buildings. Its first office was probably that of heating, though it was made so that it had to furnish ventilation in order to heat. When steam first came into use its work was entirely that of heating, and for a time schools heated by steam were a long way behind those heated by furnaces. Necessity soon compelled the use of indirect radiators to heat air for ventilation. This system had quite a run, and is still used, though it gradually loses favour as better methods come up.

The marked advance in ventilation during the last few years has been the adoption of a fan or fans run by power for sending the air to the rooms. In furnace-heated buildings the only method of creating suitable currents was by heat, and in order to induce currents in the foul-air shaft it was connected with the smoke-stack, the heat of which caused the current. In steam-heated buildings coils were used in addition to the smoke-stack. It has been recently discovered, however, that the heat used to create currents in the foul-air shaft would be of more service in running a fan to do the same work. Hence fans are in common use. There is a difference of opinion whether one fan or two shall be used. I am of the opinion that with our ordinary leaky rooms two do the work better than one, though there is room for argument on that point.

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modifications. There is one that heats entirely by steam coils placed in a fresh-air room in the basement, the air being blown to the rooms by a fan. At present I favour the adoption of a central steam plant, running direct radiators to the rooms, an indirect set of radiators to heat the fresh air, a fan to blow it into the rooms and an exhaust fan to take it out. In a cold climate it works well; in fact, I do not see how it would be possible to get so good results from any other method. In warmer places than Minnesota I suppose the hot-air system would be sufficient.

This steam system has its faults and can be much improved, especially as regards details of arrangement. While being somewhat more costly to put in than the indirect method, it makes a very low record for fuel, a good point in any plant. Contrary to expectation, it has been found cheaper to run and fully ventilate than to run the old steam plants without ventilation. It was said when fans came into use, and talk of 1,200 cubic feet of fresh air per hour per pupil was made, that it might be very well and quite necessary that we have this fan ventilation, no matter what it cost for fuel. That the fuel bill would be increased no one doubted; nevertheless, it has decreased, and this fact should be a strong argument for its adoption over the country.

The sanitary school building must properly dispose of its waste. I declare for first-class plumbing, without hesitation, where sewerage connection can be had. Where it cannot be had and cesspools are impracticable, I am not so certain what to say. There is a choice among dry closets, crematories and out-of-door privies. As to plumbing, it has been often and justly condemned. It has been the cause of much sickness and death. Whatever it has been, the day has come when a plumbing job can be made practically perfect, so that it can be fully recommended for any kind of building. In our modern school building nothing can be better than our best known water-closets, with slate or glass urinals.

However, there are schools where plumbing cannot well be had. There seems to be demand that all toilet-rooms shall be inside the building. This demand I believe to be just, provided the inside toilet-rooms can be made quite sanitary; the demand ought to be complied with. But here is the difficulty. The problem seems nearer solution than it did years ago, but there has been great injustice done in the attempt to get a safe device. The principle of the dry closet and the crematory is either to dry or burn the sewage. There has been a dry closet in use more or less where the privy vaults were in the base-

ment but wholly unconnected with any other part of the building. This seems to have met with fair success, at least in that it does not admit odours to the schoolrooms, but it costs a large amount for fuel and has no great run.

There is another dry closet in which the privy vaults are connected with the schoolrooms by means of hollow wooden floors and partitions, though sometimes this connection is made through direct ducts. This bold step was evidently taken to save fuel, and though the whole device was carefully arranged and it possesses many taking points, I believe it is inevitably doomed to condemnation as an unsanitary device. No privy vaults connected directly or indirectly with the schoolrooms ought to be upheld for a moment, for, although the draught may be made to go the right way some of the time, it will occasionally back up from the privies into the rooms, and no such thing should be tolerated. If outside privies could not be used it would be better for a scavenger to stand at the basement door with a cart and remove the contents of vaults daily or hourly, than for the public to tolerate such a thing. Happily there is a strong sentiment against this device, and attention is being wisely turned to more sanitary contrivances.

Along this line it may be well to say that the recent crematory closet seems to be somewhat in advance of the old dry closet. It has at least the merit of not being connected with the rooms, so what odour there is, not going up the stack provided for it, is not likely to get into the rooms. I have not seen the crematory closet tried, but it seems to promise well. The only difficulty I can foresee is in the disposal of the urine, which will accumulate in unpleasant quantities unless the greatest care is taken. It has been suggested that outdoor privies be used, warmed if need be; but the need of personal control while the children are in the toilet-rooms by janitor and teacher is a strong argument in favour of the inside safe closet, if such can be found.

There are numerous other points that could be touched upon in the sanitation of a good school building, and the ones on which I have dwelt could be handled more effectively. I have spoken of things that do not come within the present scope of the duties of a building inspector. The subject of school buildings is not a new one to me, for I began the investigation long before I left the ranks as building inspector of Minneapolis. At that time I had it in mind to enlarge the duties of the office, so that it should include the oversight of public school buildings as regards all the points mentioned, and I here take the opportunity to entreat you as a body that

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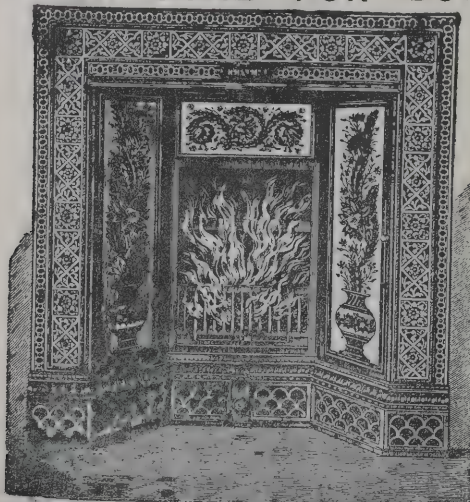
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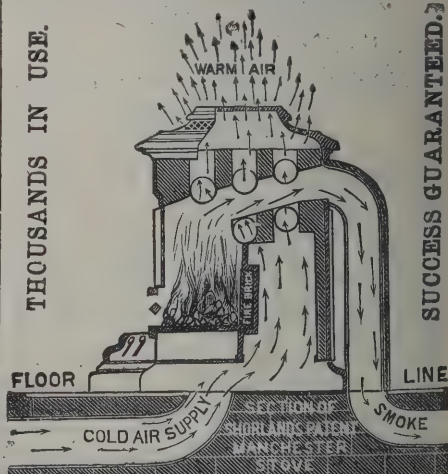
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you will use your best efforts to get the public school buildings of your various cities under the control of your office in so far as relates to sanitary requirements.

School sanitation is far too loosely managed now, and there are far too many selfish interests at work that ride rough-shod over the rights of the school population. To-day our schools are the prey of unscrupulous heating and ventilation quacks. Boards of education, well-meaning enough in their way, are their dupes. Understand me as saying there are many honest and competent heating engineers, but we need protection from the dishonest ones. In fact, in a matter that means everything to our children and posterity, some competent body should have control. Such a body would justly bar out every man whose system is not the best to be had. Remember that this is not a question of who makes the best presentation of his system, but who has the best. At present there seems to be no competent body that has authority to investigate and pass judgment in these matters. Why should not the cities take up the matter through the inspectors of buildings?

I fancy I can see why this association is peculiarly fitted for the work to meet in annual convention. We discuss things of general and particular interest. This body has less temptation to further private ends than were it composed of private individuals. I recommend the matter respectfully to your consideration.

SULPHUR IN GAS.

At the last meeting of the Manchester section of the Society of Chemical Industry Mr. R. F. Carpenter brought forward the question of the injury done by the amount of sulphur in gas. He said that the Crystal Palace District Gas Bill had been before a Committee of the House of Lords recently and one of the objects of that Bill was to permit the company to alter their Act of 1873 in respect of the quality of their gas. As a matter of fact the company being just outside the London district, where the amount of sulphur per 100 cubic feet was limited to 26 grains, sought to obtain power to supply gas containing 30 grains per 100 cubic feet. They called as witnesses Professor W. Odling and Professor Vivian Lewes. The former stated that the fixing of a 20 or 30 grain limit or no limit at all would practically make no difference to the consumer. He went on to say that, taking a gas that contained 30 grains of sulphur in 100 cubic feet, if the consumer burned that 100 cubic feet in the course of six hours, which they might easily do from

four burners at the rate of $4\frac{1}{2}$ cubic feet an hour, the amount of sulphur discharged into a room would be at the rate of five grains per hour. Supposing the gas contained 20 grains instead of 30, the amount of sulphur would be about $3\frac{1}{4}$ grains, so that the difference would represent $1\frac{3}{4}$ grains per hour. The difference between 20 and 30 grains of sulphur was productive of no injury to books or furniture, and the injury which resulted from burning gas in ill-ventilated rooms was, not at all due to the minute quantity of sulphur which it contained. The injury done to the bindings of books had, in Dr. Odling's opinion, also been wrongly ascribed to the sulphur compounds. Professor Lewes, in his evidence, said there was a general belief that sulphur was injurious, but it was his strong opinion that it was an absolute fallacy, and that the difference between 20 and 30 grains would not cause any such injury as had been suggested.

Mr. G. E. Davis, in criticising the statements of Dr. Odling and Professor Lewes, said he was surprised to hear the statements made by Dr. Odling on such a subject as that of the damage done by a large amount of sulphur in gas, because that was a thing that could be determined experimentally. From the experiments he had made he was convinced that the presence of a large quantity of sulphur in gas was decidedly injurious to furniture, books, &c. In Manchester, where the amount of sulphur per 100 cubic feet was 40 grains, its presence in an ill-ventilated room could easily be detected by mounting to the top of the room. If the gas had been burning some time the top stratum of air was so bad that no one could breathe in it for very long. The statements made by Dr. Odling were most mischievous, because they were sent out to the world with a certain stamp of authority, and they would be continually raked up by people who wished to prove that the amount of sulphur in gas had nothing to do with our state of health.

Mr. J. Dreyfus thought it was ridiculous for any chemist to say that the quantity of sulphur contained in gas was not injurious to health. Strong people would perhaps throw off its effects easily, but it would be very hurtful to people suffering from disease of the lungs. He did not think it was right that a chemist should lend his name to such misstatements as those made by Dr. Odling.

Mr. Carpenter stated that the evidence was not successful. The promoters of the Bill accepted the 20-grain limit on condition that no action should be taken against them unless the average was taken by the week and not by one particular test.



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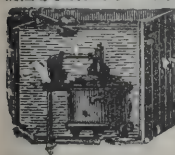
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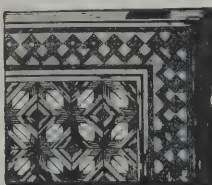
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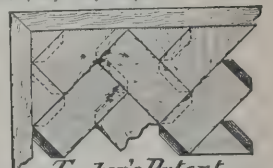
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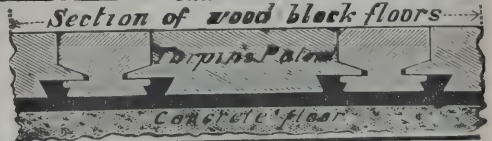
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THE ROYAL AGRICULTURAL SOCIETY.

THE annual meeting of the Royal Agricultural Society was held on Monday. The Duke of Westminster presided. It was mentioned in the annual report that through the generous action of the Duke of Westminster and Mr. Walter Gilbey, a part of the site of Harewood House, in Hanover Square, had been acquired, and it was proposed to erect upon this site a new building for the accommodation of the society, and of such other kindred agricultural associations as might wish to be located therein. The sum required for the purchase of the freehold of the site and the erection of the new building was estimated at 65,000*l.*, and the council had resolved to invite subscriptions for stock to be issued for an amount not exceeding 65,000*l.*, to carry interest at the rate of 3 per cent. per annum, secured upon the new premises. Mr. Frederick King said that the estimate was placed at too low a figure, and that to build premises worthy of the society it would cost at least 20,000*l.* more than was anticipated. The Duke of Westminster replied that the committee hoped to erect a very modest and respectable building that would be suited to the requirements and aspirations of the society. The report was adopted.

JERRY BUILDING.

THE following are extracts from correspondence in the *Standard* :—

"Householder" writes :—I am living in a house in West Hampstead, for which I pay quite a fair rent ; it has not been built two years, but in such a manner that it is almost falling down upon my head. A large piece of ceiling has already fallen sufficient to kill anyone that happened to be underneath at the time. There are large cracks in the walls of one room, and the corner has sunk half an inch, leaving a large crack down the wall. I go to bed every night in terror, for fear of a piece of ceiling descending upon me before morning.

A "Lee Householder" replies :—"Householder's" jerry-built house must be built upon a rock, for his experiences are trifling compared with mine. Some time ago one of my sons fell through the breakfast-room floor, and found himself ankle-

deep in wet clay. Eventually half the room had to be re-floored, the carpenter wading about in the clay and water, which had rotted away the boards. The wainscoting in several rooms has fallen in, and through one we can see daylight. Thirteen ceilings fell in twelve months, and so far from going to bed in terror, we have become so reckless that a few months ago, when the bathroom ceiling during the night fell with a crash, we simply turned over in our beds, and with a yawn lazily exclaimed, "Another ceiling down, I suppose !" Sometimes the noise of the water-pipes warns us that the floods are about to lift up their waves, and the staircase quickly becomes a miniature Niagara Falls.

A "Tenant" adds :—We must presume, I suppose, that all existing houses conform to the requirements of the Building Acts, but how strongly does this show that these Acts need serious amendment ? Until recent years 14-inch walls were the rule. Now they are the exception, and a 9-inch wall nearly always prevails, not only in low-rented houses, but even in those "eligible family residences" for which they have the conscience to ask rents for which an ordinary tenant would be entitled to expect to get a thoroughly well-built house. I should much like to be informed by some competent authority whether a 9-inch wall is thick enough for health and comfort. It may be just enough to support the light and slender roof of sparest timber and thinnest slates ; but it cannot, like the walls of old, defy both cold and damp. Houses of the present style, with no basement, have scarcely any foundations. The soil on which they stand is generally in its original state beneath the flooring of the sitting-rooms. No concrete, asphalt or other impervious substance intervenes. The drains in most cases are beneath the floor. The upper rooms have an Arctic temperature in winter and a tropical heat in summer, the slates being only fixed on battens. Can we wonder at the large amount of delicate health which exists and at the prevalence of diphtheria and other kindred diseases ?

THE TRENT AND MERSEY CANAL.

ABOUT two years ago the North Staffordshire Railway Company obtained statutory powers to raise money for the purpose of widening and improving the Trent and Mersey Navigation. The carrying out of the improvement scheme is necessarily a work of time as well as of great cost, but the matter has been taken earnestly in hand, and the canal between Middlewich and the Anderton hydraulic lift, a distance of about eleven

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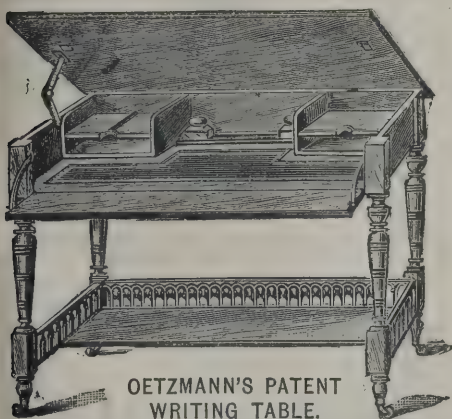
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miles, has been widened, deepened and otherwise improved so as to allow of the passage of barges of a larger class. This will not greatly affect the traffic of the Potteries, but it is a matter of interest to North Staffordshire traders as the first instalment of an improvement which the company have practically promised to extend right up to the Pottery towns. It may be mentioned that the ordinary class of canal boat carries a freight of from twenty-five to thirty tons, and is not able to navigate the Mersey. The enlargement of the canal will enable a new type of boat to be used, carrying from forty to sixty tons, capable of navigating the Mersey, and thus avoiding the inconvenience and cost of transhipment. As stated, a passage for the larger boats has at present only been made as far as Middlewich. At the latter place, what was known as the pool, formerly only some 16 feet in width, has been widened to 50 feet by the erection of a massive concrete wall, which separates the waters of the river and canal. The wharfage has been largely extended, and steam-cranes and other appliances for dealing with a large traffic are being provided. A little lower down, the only lock existing between Middlewich and Anderton has been widened to 16 feet 6 in., and throughout this section the waterway has been widened by several feet and dredged to a uniform depth right across. An important feature of the widening is that for about four miles a solid wall of masonry, averaging 4 feet 6 inches in depth, has been built alongside the towing path, so that a sufficient depth and width of waterway is made to allow two barges to pass at any point between the bridges. Some two miles yet remain to be done, the other portion of the section being already walled. A steam dredger, of the Priestman type, and twelve spoon boats have been constantly employed, and during the last fifteen months from 80,000 to 100,000 tons of stuff have been removed. It has been necessary to rebuild and widen all the bridges, in order to admit of the passage of larger craft, no less than eighteen being so dealt with altogether. The roadways over the bridges have in most cases been widened, and the old steep approaches run out at easier gradients. Most of the work has been done without interfering with the traffic, and the fact that such an extensive undertaking should have been carried out practically to completion with only about twelve days' stoppage out of fifteen months testifies to the skill and forethought of both the engineer and contractor. The works have been carried out from the plans of Mr. E. B. Smith, canal engineer to the North Staffordshire Railway Company, and the contractor for the walling and the bridges was Mr. F. Barke, of Stoke.

WATER RESOURCES OF LONDON.

THE *Standard* says:—The discovery of the lower greensand, with its large supply of excellent water, by means of an artesian boring in Windsor Forest, is a matter of considerable importance to the inhabitants of London, as helping to show the extent of the underground sources available for the supply of the Metropolis. Wells sunk to a great depth in the chalk have hitherto furnished the best water that London has received; but there is only one district out of eight where this is unmixed with a large proportion taken from the Thames or the Lea. The lower greensand has long been sought, as containing water superior to even that of the chalk, being much less hard and therefore well adapted for domestic use. A purer supply is scarcely conceivable, as proved by that which is obtained from the artesian well at Grenelle in the suburbs of Paris and others elsewhere. Reigate, in Surrey, and the neighbourhood of Baldock, in Hertfordshire, afford the nearest examples of greensand water in the vicinity of London. Windsor appears to fall naturally within the area of the metropolitan supply, as it lies in the Thames valley not far above the intakes of the London companies. At Baldock the population is supplied from the chalk, the greensand water being only obtainable a few miles to the north. In that locality the gault was penetrated by means of a well, and on the lower greensand being reached the water rose within three feet of the surface. At Reigate there is a company supplying water from the lower greensand, and the stratum has also been reached at Merstham. But all attempts to get at this formation in the immediate neighbourhood of London have failed, owing to the uprising of the primary rocks cutting off the continuity of the lower greensand, which otherwise would pass under London in the same way that it is known to do under Paris. The discovery now reported is hopeful, as showing the presence of the desired stratum to the west of London at a moderate distance. There is also the important fact that the water rises to an altitude which shows that the boring is a true artesian well. More water of the same kind must be near at hand, and although the Windsor Forest boring is nearly a quarter of a mile deep this affords no serious objection. The well at Grenelle is nearly 500 feet deeper. The Royal Commissioners who reported on the London water supply above twenty years ago were strong in their belief that the subterranean sources of a pure supply were peculiarly large within a radius which London could easily command.



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TRADE NOTES.

THE Princess May has been pleased to accept the gift of a Yost type-writer, and has desired the Comptroller of the Household at White Lodge, Richmond, to thank the managing director of the Yost Typewriter Company for the present, and for the congratulations and good wishes which the company have tendered at the present juncture.

MESSRS. JOSEPH KAYE & CO., Limited, of 93 High Holborn, and the Lock Works, Leeds, have supplied their patent exit door furniture and bolts to the doors of the Imperial Institute.

THE Bradford County Council have accepted the tender of Messrs. H. Birkby & Sons for the construction of a tar tank at the Valley Road Gasworks, for 4,295/.

THE Secretary of State for Foreign Affairs has learnt from Her Majesty's Consul-General at Salonica that tenders will be received on the 1st proximo for the construction of the first hundred kilometres of the Salonica-Dedeagatch Railway. The documents relating to the tenders and the execution of the work can be seen at the office of the chief engineer at Salonica, and at 417 Grand Rue de Péra, Constantinople. Tenders for the construction of the remaining 400 kilometres of the line will be received between August and October next.

THE Building Committee of the Carlisle Corporation have accepted the tender of Messrs. Latimer Clark, Muirhead & Co., Limited, Regency Works, Westminster, amounting to about 1,450/ for the installation of the electric light at Tullie House. The tender does not include the foundations and the masonry and joinery work, but it includes gas-engines and the provision of duplicate plant as a safeguard against accident.

AT the Bath and West of England Show at Gloucester this year, Mr. Charles D. Phillips, Newport, Mon. and Gloucester, was well represented in the machinery and implement departments, and had in connection therewith an office covered with his patent "lock-jaw" roofing tiles, the "single-grip" system being shown on one side and the "double-grip" on the other, the whole being tastefully finished off with two elaborate "Griffin" finials, with weather-boards and ridges to match. We understand that Mr. Phillips has had considerable difficulty in keeping up with the demand for his patent tiles during the past half-year or more, and has now made arrangements for a greater output from his works at Bridgwater, and this fact, in addition to the several recent testimonials received, points very

conclusively to the continued success of these tiles. One order has been received from Australia for 24,000, with the promise of further business if the supply can be kept up to the demand.

THE Guisborough Board of Guardians have selected the tender, out of sixteen others, of Mr. G. M. Rudge, Normanby, at 3,235/., for the building of their workhouse infirmary.

THE contract for forming the new streets on Carlisle Sands has been let to Messrs. Beatty Bros., builders, Carlisle, who have undertaken to do the work at a cost of between 1,500/ and 1,600/.

VARIETIES.

UNDER date May 30 Mr. B. T. Batsford writes:—"I shall be much obliged if you will kindly find room in your columns to mention that after June 5 my business, which has for over forty years been carried on at 52 High Holborn, will be removed to more convenient premises, No. 94 High Holborn."

THE Mersey Docks and Harbour Board at their meeting confirmed the recommendation of the Warehouse Committee of the 17th inst. to make certain alterations at a number of the hatchways at the Albert Dock warehouses, at a total estimated cost of 1,050/.

A MEETING of Linlithgow Police Commissioners has been held for the purpose of considering as to the establishing a Dean of Guild Court for the burgh. The following members were appointed a Court, viz.:—Dean of Guild Fleming, Provost Gilmour, Bailies M'Alpine, Morrison and Russell, Treasurer Jamieson, and Councillor Philip. Mr. James Bambery, burgh officer, was appointed master of works to the Dean of Guild Court.

THE Stourbridge Commissioners having agreed to purchase the local gas undertaking, referred the amount to be paid to arbitration. The umpire's award has now been received, the purchase money being fixed at 99,800/.

THE Athens correspondent of the *Standard* says:—"According to the report of the Ephor who has been commissioned by the Government to represent it at the excavations the French are carrying out at Delphi, a colossal marble head has recently been found there almost intact. It evidently belonged to a great statue of Apollo, which was erected at the Delphic Oracle in ancient times. The hair is represented as tied up with a riband, and the brow is encircled with a crown. A metope has

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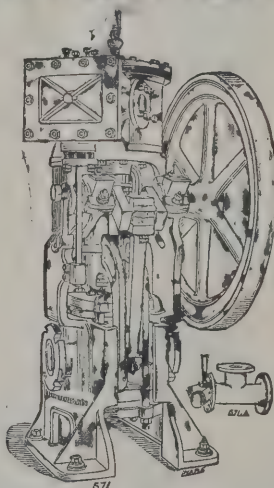
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T. FORMAN, Walnut Tree Walk, Kennington Road, S.E.

been discovered which belonged to the building which was the Treasury of the Athenians at Delphi. It represents a fight between bulls. Twenty Consular votive inscriptions have also been found referring to the deliverance of slaves.

PLANS have been prepared for extending Devonport Dockyard, and, if carried out, Devonport will be one of the finest naval ports in the world. The Government have assented to an expenditure of 70,000*l.* for the pier and 15,000*l.* for machinery at Keyham for extending the coaling arrangements. The plans include the building of three new docks, one 600 feet and the other two 500 feet in length, the docks being entered from a basin 700 feet wide, while the basin itself is entered from a lock 600 feet long.

THE *Scotsman* says:—A fine specimen of ancient carving has just been brought to light in the parish church of Holm—a well formed and well preserved cross carved on stone. It seems to have been originally fixed in the ground as a headstone, or more probably, since it has no letters, name or date on it, was used to mark the place where the first missionaries of the Cross preached the Gospel in Orkney, like the famous one still preserved in Ruthwell parish church. Mr. James Linnie, Ducro, the oldest inhabitant, within a few weeks of ninety, says it was found many years ago buried in the floor of the church, when repairs were being executed many years ago (may it not have been hidden there from the ruthless hands of the over-zealous Reformers?). It has long lain in a neglected corner, but Mr. Peace, architect, Kirkwall, has now obtained leave from the heritors to have it placed in a suitable position in the wall of the church.

THE Lancashire and Cheshire Antiquarian Society lately made an excursion to Cambridge. Among the places of interest visited under the guidance of Mr. J. Pink, chief librarian of the Cambridge Free Library, were Emanuel College, Christ College, Magdalen College, and St. Peter's Church. The various objects of interest and historical associations connected with the several buildings were pointed out. Under the leadership of Mr. J. D. Atkinson, secretary of the Cambridge Archaeological Society, the party visited Pembroke College, the museum, St. Peter's, Queen's and St. John's Colleges, and King's College. Finally the members went to Jesus College, of which they were shown the many interesting features.

AT the quarterly meeting of the general court of governors of the Middlesex Hospital the court authorised the expenditure of 2,093*l.* on new teak floors, painting and repairs.

THE Local Government Board have granted a provisional order to the Honley Local Board for the compulsory purchase of about seven acres of land for precipitation tanks and land filtration. The provisional order was opposed by the Huddersfield Corporation and the land owner. Before carrying out the scheme, however, the Honley Local Board have asked the Huddersfield Corporation on what terms they would allow the Honley sewage to be connected to the Huddersfield system. Mr. W. H. Radford, C.E., of Nottingham, is the engineer for the Honley scheme.

THE Local Government Board have also issued a provisional order granting to the Macclesfield Corporation compulsory power to purchase about 200 acres of land about three miles from Macclesfield for sewage-disposal purposes. Application will soon be made to the Local Government Board for sanction to a loan to carry out the works. Mr. W. H. Radford, C.E., of Nottingham, is the engineer.

AT Glasgow a tenement of dwelling-houses at the junction of Abercorn Street and Burnside Street, has become so seriously undermined, owing, it is said, to the subway operations in the neighbourhood, that an order has been issued by the Dean of Guild Court to have the building reconstructed, and the tenants have been warned to immediately vacate the houses.

IT is stated that for the first time the Board of Trade has sanctioned the use of automatic signals on a railway, in the case of the overhead electric railway in Liverpool, and though the line is only seven miles long, the company will save from 2,000*l.* to 3,000*l.* yearly in signalling expenditure.

A PUBLIC meeting has been held urging the desirability of rebuilding Lambeth Bridge. Last year the County Council resolved that it should be rebuilt, but in the meantime a proposal has been made to reconstruct Vauxhall Bridge at a cost of 400,000*l.*, with the possible removal of Lambeth Bridge.

THE *Nottinghamshire Guardian* says:—Although the fifteenth exhibition of pictures in oils, water-colours, and black and white by local artists at the Castle Museum cannot be designated as "important" in the numerical sense, it is interesting as marking a distinct advance in quality of work. The hanging committee have exercised great care this year. Quality, and not quantity, appears to have been their aim.

THE Gas Committee of the Aberdeen Town Council have decided to appoint an engineer, at a salary of 200*l.* a year, to take charge of the electric lighting department.

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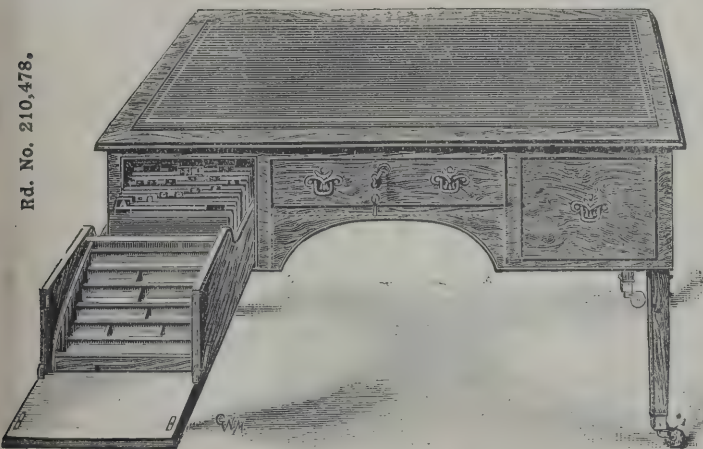
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AN election of one pensioner on the funds of this charity took place on Thursday, May 25, at the office, 35 Southampton Row, Bloomsbury Square, W.C., Mr. George Plucknett, J.P. (hon. treasurer), presiding. One man only had to be elected, and the voting was as follows:—J. L. Mould, 60 Muriel Street, Islington, aged seventy-one, builder (third application), 1,791 votes; Alfred Clement, 115 Bedford Road, Brixton, aged seventy-two, builder (first application), 1,020 votes; Jace Taylor, 14 St. James's Road, Bermondsey, aged sixty-one, master slater (first application), 701 votes. Votes were also given for the following women applicants, viz. Sarah E. Drake, Tilers' and Bricklayers' Almshouses, aged sixty-three, widow of builder (fifth application), 2,647 votes; Susanna Mansell, Hammersmith, aged seventy, widow of builder (fourth application), 2,953 votes; and Mary Anne Healing, 20 Curtain Road, Shoreditch, aged sixty-three, widow of builder (third application), 210 votes. The successful candidate was J. L. Mould.

Messrs. Thomas Stirling and T. F. Rider acted as scrutineers, and amongst the friends of the charity present were Messrs. J. W. Mitchell, C. Bussell, G. M. Watts and T. Stirling, junior.

Votes of thanks to the chairman and scrutineers closed the proceedings.

RUSSIAN INDUSTRIAL ART.*

RUSSIAN industrial art is so wide a subject, that to treat it properly would be quite impossible in the compass of one lecture. I propose, therefore, to take you with me through Russia, drawing your attention to certain points relating to her arts and industries.

My first experiences of Russia were at St. Petersburg, that capital which owes its existence to Peter the Great—a city of stately palaces, of immense squares, of handsome monuments, but with little distinctively Russian about it. St. Petersburg was the window from which Peter looked into Europe. When he came to the throne, Russia was in a non-progressive state, clinging to the past with its superstitions and traditions, and

* A paper read before the Foreign and Colonial Section of the Society of Arts by Mr. E. Delmar Morgan.

bearing the impress of the Tartar yoke. He determined to cut asunder the bonds which tied her to the East and create a new Russia by opening the door to Western civilisation.

It has been said that Peter's reforms did more harm than good to his country by interfering with her gradual development, that Russia left to herself contained all the elements of national greatness, and that it was too soon to polish her in accordance with western ideas. However this may be, there can be no doubt that the genius of Peter raised Russia to the rank of a first-rate power, and that, had it not been for his reforms, she would have remained in a semi-barbarous state, a stranger to the arts, the industries and the sciences of Europe.

St. Petersburg is a medley of Italian, French, German and Dutch styles, or rather it has no architectural style about it. In its chief street—the Nefsky Prospect—you might imagine yourself in Turin, or Paris, or Munich, were it not that the painted sign-boards over the shop fronts, the dress and appearance of the people, and the mode of harnessing the horses, remind you that you are in Russia. St. Petersburg, however, contains magnificent public buildings and many priceless treasures of art stored away in palaces, museums and private collections.

St. Isaac's Cathedral, designed and built by the French architect, Montferrand, with its five gilt domes, its monolith columns of polished granite and its gorgeous interior, is a grand conception carried out in spite of every difficulty. The design is foreign, the malachite and lapis-lazuli columns before the altar screen are hollow, the splendid mosaics are of foreign workmanship; yet the whole edifice is impressive and has something distinctively national, if only in its vast proportions and in the costly materials used in its construction. None but a Russian Tsar, the head of Church and State, could have, at so lavish a cost, erected so noble an edifice designed solely for the worship of God. Mr. Beavington Atkinson, in his work, "An Art Tour to Northern Capitals of Europe," says:—"The world owes its great cathedrals to the combined religious and temporal power." St. Petersburg—this northern Venice, as it is called—is in startling contrast with the squalor and poverty surrounding it. When once you are beyond the twenty-mile radius and have left behind the capital and its elegant suburban retreats, you are in a wilderness of marsh and scrub wood, with here and there a village of dilapidated log-huts and a poverty-stricken agricultural population barely furnished with the necessities of life.

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Empress Catherine, is a palace of art, in its way as splendid as St. Isaac's. Its collections, comprising the famous treasures found at Kertch, are unsurpassed. Here are specimens of Greco-Scythian and other early arts, which have helped to build up the Russian art of to-day. What this Russian art is and of how many elements composed, are questions upon which authorities differ. Besides Greco-Scythian, Scandinavian, Greco-Byzantine, Mongol, Indian, Persian, Central Asian and Finnish have been mentioned. To these have to be added the later influences of Western Europe—Italian, German, French and English. With regard to Scythian, M. Vladimir Stasoff has pointed out in the "Magazine of Art" that Mr. Alfred Maskell (who follows M. Viollet-le-Duc), in his South Kensington "Handbook of Russian Art," is wrong in identifying the nomadic Scythians depicted on this celebrated Nikopol vase with the ancestors of the Russians, for the Poliani-Kiani, whom Nestor mentions as the ancestors of the Russians, were a peaceful, agricultural people, altogether distinct from the warlike Scythians of Southern Russia, and Father Martinoff takes the same view.

Composed of so many and such heterogeneous elements, one might have supposed that the native art would have altogether disappeared; yet in spite of these adverse circumstances there remains a substratum peculiarly Russian underlying the foreign superstructure. This native art may probably be seen at its best in the works of the young Russian school of painters, sculptors and authors, in their efforts to attain realism, to make the canvas, the stone, the bronze and the writing speak for them and tell of the realities of Russian life. This realistic side of Russian art is exceedingly interesting, for studies of real life are often true to nature, while attempts at an ideal in religious art, for want of inspiration, fall short of the sublime.

There is hardly a cathedral, church or monastery throughout the Empire that has not some traces of Greco-Byzantine influence. St. Sophia at Kiev, with its mosaics of the eleventh century, and the cathedral of the Assumption in the Kremlin, at Moscow, are examples of the earlier style. The plan of all these buildings is the Greek cross, a dimly-lighted, almost dark interior, walls painted with frescoes, a gorgeously decorated ikonostas, or altar-screen, and a great central dome or cupola. The general effect, during a religious ceremony, heightened by lighted tapers, burning incense, the chanting of the choir and the rich vestments of the priests, is very impressive.

While following Byzantine models in the general design, Russian architecture adopted a peculiar form of cupola, re-

sembling an onion, altogether distinct from the domes of St. Sophia at Constantinople, St. Peter's at Rome, St. Paul's in London and St. Isaac's in St. Petersburg. This bulbous cupola, said to be of Central Asian origin, and surmounted by a cross rising from a crescent, is characteristic of ecclesiastical architecture in Russia.

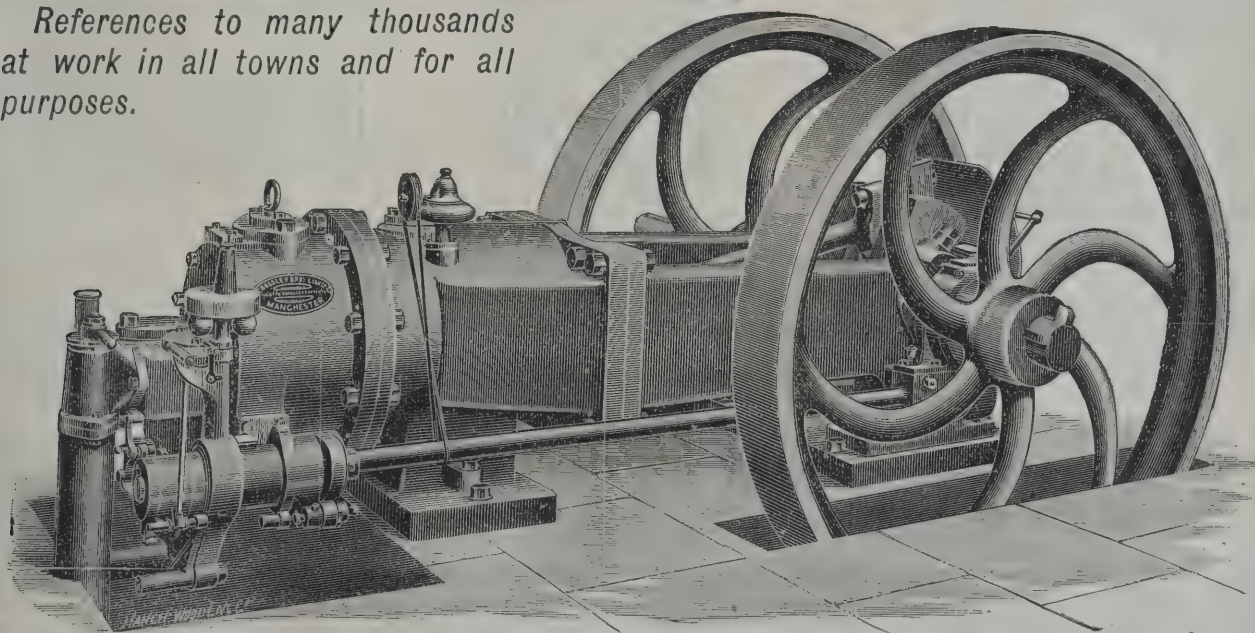
In decorative art, these same Byzantine influences, due to the close intercourse between Russia and the Eastern Empire before and after the introduction of Christianity, are equally conspicuous. They may be noticed in the silver pectoral crosses and other metal-work, the wood-carving, the embroidery on leather, and even in the textile fabrics. The English and foreign embassies which visited Moscow in the sixteenth century were much impressed with the gold and silver plate in the Tsar's palace. Some of this was doubtless brought as presents from foreign countries, some was the spoil of war, but the greater part was manufactured in Russian workshops. In 1880 our Government applied to that of Russia for permission to reproduce some of the numerous examples of English plate and other works of art in the imperial collections. The Emperor having graciously consented, a number of electrotype facsimiles were made and brought to England. These are exhibited in the galleries at South Kensington. They include vases, cups, flagons, salts, tankards and jugs, besides a number of other pieces used at state banquets. Russian silversmiths' work has obtained a world-wide reputation both for elegance of design as well as for the purity of the metal used.

Enamelling on gold and silver is another art peculiarly Russian, derived also from Byzantine and Eastern sources. When Russian art ceases to be Eastern in character it will have lost its claims to be regarded as a national art. Imitations of English, French and German designs, however skilfully made, for the Russian artificer is a good copyist, are, after all, only imitations. To form a true idea of Russian art it is necessary to visit Moscow, Novgorod, Kiev and some of the monasteries and churches. But I must now say something of the manufacturing industries centred round Moscow.

Before the reign of Peter the Great, the industry of Russia was of a domestic, local character, and confined to villages. The chief articles of manufacture were woollen goods, cordage made of hemp, a coarse kind of linen, leather, metal-work and articles made of wood. These were for home consumption as well as for export abroad. After the famous act of Boris Godounoff, obliging the peasants to give up their roving propensities and become fixed to the soil, the native industries

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greatly increased, that of leather especially benefiting. The leather industry was then centred in the governments of Kazan, Nijni Novgorod, Moscow, Yarozlaf and Kostroma; tallow-melting works were also numerous; soap was manufactured at Kostroma; tar came from the district of Kargopol and the Vaga, where potash was also produced for export; Moscow wove cloth and silk stuffs, deriving the raw material from Persia; Kholmogory produced ironbound trunks and cases; Yarozlaf, small ironware; Tula was the small arms factory, a position it has retained to this day; from Vladimir came the ikons, or religious paintings on wood. As the demand sprang up for some new article, whole villages devoted themselves to its production, and these industries became hereditary, descending from father to son for generations. The next step was their organisation on the factory system, the domestic character of the industry being still retained. Thus, in the time of the Czar Alexis Mikhailovitch, iron and bell foundries attained a certain degree of development. The government of Olonetz was the first seat of the native iron industry, now transferred to Southern and Eastern Russia. Gunpowder was then manufactured near Moscow, writing-paper and glass in the neighbourhood of Moscow. But the great impetus was first given to native industry by Peter the Great, who conceived the idea of planting the arts and industries of Western Europe in Russia. It is well known how he laboured himself in acquiring a practical knowledge of these arts in Holland and England. In Russia his efforts were untiring. He invited foreigners to come over, encouraged them to establish factories, protected these by all kinds of privileges, and, what was of the greatest importance, established Government factories to which villages were attached. The export of raw produce useful for manufactures was prohibited, the import of foreign fabrics limited. The Government became the chief buyer of the produce, often paying dearer than its value. Lastly, a separate college was founded for the encouragement and protection of manufacturers.

By the end of Peter's reign Russia numbered 250 manufactures, including almost every known branch of industry at that time. But the measures taken to bring these into existence were of an artificial nature, and gave rise to monopolies, the evil effects of which were felt for the fifty years succeeding Peter's reign. About 1770, however, notions of free trade made their way into Russia, and led to a reversal of the protective system. The privileges were withdrawn, the college of manufactures was closed, and the foundations laid

of a more normal development. It was not, however, till about the middle of the present century that free trade began to exercise a marked influence on Russian political economy, the tariffs of 1850, 1857 and 1869 having gradually adopted a more moderate scale of duties, better suited to the requirements of the country. Nevertheless, many years will probably elapse before the protective system is entirely done away with, for the artificially-created industries of Russia have obtained so firm a hold that any sudden change might cause widespread distress and financial derangement.

The manufacturing industries may be grouped under the following heads:—

1. Textile fabrics, including those made of wool, flax and hemp, cotton, silk, with their contributory processes, such as gold thread and cloth of gold brocades, calico-printing, dyeing and bleaching, &c.
2. Products of wood, including builder's material, joiner's work, parquet flooring, turner's and cooper's work, articles made of bark, matting, tar, pitch, turpentine, &c.
3. Animal products, *e.g.*, leather in all its branches, tallow, wax, hair and bristles, and miscellaneous articles, such as horn, bone, glue and feathers.
4. Mineral products, such as bricks and tiles, pottery, china and porcelain, glass, chalk, alabaster, mortar and cement, stone-cutting and polishing, and pencils.
5. Metals, comprising cast-iron, wrought-iron and steel, with their products, copper and the precious metals, with their products.
6. Chemicals, including dyes, potash, sulphur and sulphuric acid, vinegar, lacquer, cosmetics.
7. Tobacco.
8. Food products.
9. Miscellaneous, including carriages, musical instruments, straw fabrics, &c.

To examine all these in detail would take up far too much time. I shall, therefore, confine my remarks to those with which I have had some personal acquaintance.

The cotton industry, dating only from the middle of the last century, now occupies the foremost place among Russian industries. The first calico printing works was established in 1764; in 1793 the first spinning mill was started; in 1805 yarn was first woven by machinery at Alexandrofsk, near St. Petersburg. About 1820 this industry acquired some development in connection with village industries, especially at Ivanovo, now a very important centre, where the commoner kinds of calico



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WORKS, ROTHERHAM, Estab. 1854.

were woven under the superintendence of German artisans, at the beginning of this century. But the chief development of the cotton industry was due to the free importation of English looms in 1840. About that time (1843) my father founded the Petrofsky Cotton Spinning and Weaving Company, at Alexandrofsk, on the left bank of the Neva. About twenty years later, when the number of cotton mills had largely increased, and the competition was much greater, he acquired by purchase the Schlüsselburg print works, situate on an island in the Neva, where this river issues from Lake Ladoga. Here, abundantly supplied with the purest water, and furnished with the most costly machinery that Manchester could supply, the Schlüsselburg Calico Printing Company soon took rank among the first establishments of the kind in Russia. They are at the present day in full work, turning out an enormous quantity of prints.

To give an idea of the growth of the cotton industry in Russia, I may mention that, in the period of 1866-79, the production of prints increased 167 per cent., while the number of works diminished 19 per cent., this increase in production *pari passu* with the diminution in the number of manufactories being attributable to improved machinery; for while in 1866 one man produced 178½ pieces of print, in 1879 he produced nearly 100 per cent. more. The spools spun in 1866 aggregated 1,895,500 puds (30,000 tons), in 1879 4,290,000 (70,000 tons). The calico woven in 1866 amounted to 3,972,000 pieces, and in 1879 to 14,821,000. In 1866, 3,384,000 pieces of calico were printed; in 1879, 9,050,000 pieces. In 1866, the number of hands engaged was 94,566; in 1879, this number had risen to 162,691. These figures will serve to show what great strides Russia is making in this industry. Later returns are even more striking. The value of yarn spun rose from 42 millions of roubles in 1867 to 133 millions in 1888. With this increased production the number of mills remained stationary, while there were fewer print works, proving that the industry was becoming more concentrated, the smaller establishments being absorbed by the greater.

During the last ten or fifteen years prices of cotton goods have declined, while the standard of quality has risen. The improvement in the art of dyeing is especially remarkable, particularly in reds—the popular colour; and it is stated in a recent work by M. Ruffalovitch, the well-known Odessa banker, that manufacturers like Baranof, Hübner, Zündell, the Tzareva Company, and Morozoff are now able to produce the finer textures suitable for the markets of Central Asia and China,

where Russian manufacturers are competing successfully with those of Manchester.

In forecasting the future of the Russian cotton industry, it may be worth remembering that, while dependent to a large extent on other countries—on America for the raw cotton, on England for machinery, on Mulhausen and Rouen for designs—yet there are signs of the industry becoming nationalised. Central Asia supplies cotton, which, though inferior in staple, does very well to mix with American and other sorts. Russian mechanics are learning to make machinery, and though this branch of the industry is still backward, the time will come when English mechanical skill will no longer be needed in Russia.

If we would see something thoroughly Russian we must visit the forest region of the north—the governments of Archangel, Olonetz and Vologhda, where the population is chiefly occupied in one form or another with the wood industry. Russia, says Mr. Atkinson, is, as far as her arts are concerned, in the period of wood. In winter, with his *topor* or hatchet, the peasant enters the forest, fells the giant pine, the larch, the birch tree or white fir, and drags the fallen log with his little pony to the stacking-place, there to be stamped by the receiver. In spring he rafts the timber down the smaller stream to its confluence with the great river, then down this to the sawmill or seaport. Large numbers of the population find employment and earn a livelihood in this way. The subsequent operations of sawing the round logs into deals, or squaring them for building purposes, is another branch of the industry. The villages in Great Russia are all built of wood. Some of the churches are of the same material, the best to resist the extremes of cold and heat of the climate. There is little room for the display of decorative art in these log-cabins; occasionally, however, the traveller comes to a village where the façades are adorned with carved roof boards, and the window frames and shutters sometimes gaily painted. These have a picturesque appearance, reminding one a little of the Swiss chalet. On internal decorations and fittings the peasant of Great Russia devotes little labour or taste. He is too much concerned with the struggle for existence to have a mind for the beautiful in art. Quite different is the Little Russian. He adorns his *mazanka*, or clay hut, outside and in with flowers, and tastefully embroidered linen cloths disposed on the walls; but the Cossacks of Little Russia are distinct in language, habits, and dress from the Great Russians, so much so, indeed, as to form with these two nationalities.

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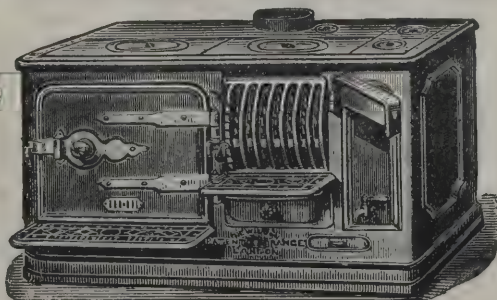
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The industrial art of the peasantry is chiefly religious. Pictures of saints, called ikons, painted on wooden blocks or copper, are familiar objects, seen in every Russian dwelling, from palace to log-cabin. These paintings are mostly sombre representations of the Virgin, our Saviour, or some saint, often covered with plaques of silver, silver gilt, and even gold in some of the churches, leaving only the face, hands and feet exposed. A lighted lamp hangs before them on church festivals and saints' days. The preparation of the boards for these paintings is an industry of the government of Vladimir, the painting being done by hand in the monasteries. The method adopted is that of subdivision of labour: one set of monks paint the face, another put in the nose, a third the eyes, so that every feature is rendered in a particular style, which never varies. This is the height of conventionalism in art, and fully accounts for the absence of artistic merit in the ikon. The great sanctity attributed to some of these pictures is due to the miraculous legends surrounding them. For instance, over the sacred gate of the Kremlin at Moscow is a picture of the Redeemer of Smolensk, held in such high veneration that everyone passing under it uncovers his head. The image of St. Nicholas of Mojaisk, of our Lady of Kazan, and many others have all their legendary histories associated with some event in the life of the nation.

It would be interesting to follow up this subject, and trace the history of religious painting from the eleventh and twelfth centuries, when the monks of St. Athos produced a very similar type of sacred picture. Transferred to Russia, the art has remained almost unchanged, the stirring events in her history finding but faint echoes within the strong, fortress-like walls of the monasteries.

Mr. Morfill, the well-known author and reader in Slavonic languages at Oxford, classifies the different schools of ikon painting under the following heads:—(1) The Byzantine or Chersonian school; (2) the school of Moscow; (3) that of Novgorod; and (4) that of Stroganof. According to this authority, the first artists were of Greek origin, but they soon found Russian pupils. The models which had been received at Byzantium were faithfully adhered to at first, but gradually the art of ikonography acquired a different character in each part of the country. But M. Leroy-Beaulieu says that these schools were, strictly speaking, workshops, differing only in their treatment of the drapery and colours. The chief distinction I have noticed is that between the ikons of the old believers and those of the orthodox, the first having adopted a miniature

style of painting, and eschewing all representations of Christ and the Virgin.

In recent times, however, a more artistic style of picture has been produced by the aid of chromo-lithography, and at the Troitsa Monastery, near Moscow, and the Pechersky Lavra, near Kiev, large numbers of these new ikons are sold to the pilgrims.

The industries of cabinet and furniture making have flourished in the governments of Perm, Nijni-Novgorod, Vladimir, Viatka, Tver and Moscow, the furniture of Viatka being celebrated for its cheapness. This is not, however, a very flourishing industry at the present time. The Russian peasant's requirements in the way of furniture are of the simplest; a table and some benches are all that is needed. The only thing he buys is the *sunduk*, or iron-bound wooden trunk, sold in large numbers at all the great fairs.

Of the smaller articles in wood, there is a very large production of spoons, knives, forks, and cups. The wooden spoon, Byzantine in shape, is indispensable in every household, for with this every peasant eats his food. These spoons are sent in large numbers to Central Asia, and with the samovar, or tea-urn, will in course of time help in civilising the nomadising Kirghiz, who now eat with their fingers. We should not omit to mention the important part that matting, made from the bark of the lime-tree, takes in the domestic economy of the Russian people. Of this are manufactured the bags to contain flour, grain, &c., the heaviest and best being those used for flour. The bark of the young lime-tree is stripped to make into sandals, and of these some millions of pairs are required, involving the destruction of an almost incredible number of trees. It takes the bark of four saplings to make one pair of sandals, and it is estimated that ten millions of pairs are required annually. The trees are stripped in spring and summer, when they are full of sap.

The art of dressing leather is one in which Russia has excelled. "Russia leather," known as *yuft*, was an article of export in the seventeenth century, and efforts have been made to improve and develop this industry, but without any marked success. The tannery at Ostashkof, in the government of Tver, on Lake Seligher, at the source of the Volga, continues its old-fashioned methods, supplying the English market (it is curious that this leather should there be known as "English") with nearly the whole of its production, notwithstanding the fact that the secret of its preparation has passed into other countries, and that Austria and Germany manufacture the famous leather at one-third of its cost in Russia. The final

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processes in its preparation are done in England, and these enhance its value tenfold, so that by the time it returns to Russia in the form of pocket-books, portfolios, book-bindings, &c., the Russian buyer has to pay dearly for his own leather.

In the same government of Tver is the town of Torjok, once noted for the beauty and picturesque dresses of its women and for its gold and silver embroidery on leather—an art probably learned from the Tartars. The embroidery is all done by the women in winter, and is exposed for sale at the stations on the Nicholas Railway. Specimens of it were shown at the London exhibitions of 1851 and 1862, where they attracted no little attention.

It may be worth mentioning that Torjok is one of those places adversely affected by the introduction of railways. Not only has its famous leather industry declined, but the distinctive dialect, manners and customs of the Novo-Torjians, as they are called, are things of the past. Its picturesque costumes are only to be found in books, and what is more serious, according to a modern Russian writer, its rosy-cheeked, bright-eyed maidens have disappeared.

The iron industry ranks only second to that of textile fabrics in Russia. When I visited the mines and works of the Ural, some thirty years ago, Russia's iron trade was of no great importance. Prince Demidoff's and M. Yakovleff's were then the only large works except those of the Government. At these charcoal iron of a high quality was rolled into rails or hammered into thin sheets for roofing. The growing scarcity of forests, felt even in those days, has limited the production, and the chief seat of the iron industry is being transferred to Southern or New Russia, where iron mines and coalfields have been discovered. But the Ural range is rich in copper, and the precious metals. Semi-precious stones, such as malachite, lapis-lazuli, aventurine, jasper and porphyry are found there. These are cut and polished in the Government works at Ekaterinburg, and adorn the halls and galleries of the Hermitage and other public buildings at St. Petersburg. The objects consist of vases, tables, paper-weights, &c., and are attractive, not so much for any novelty or elegance in design they may have as for the rarity and beauty of the stones, as well as for immense labour expended upon them. The celebrated malachite doors, exhibited in London in 1851, are an instance of this stone-polishing art.

From recent statistics we learn that there were 522 iron mines in the Ural in 1888, producing 49 millions of poods of metal; 20 mines in Southern Russia, with a production of

14 millions of poods; and 63 mines in Poland yielding 12 millions, total amounting to 87½ millions of poods, or nearly 1½ million tons of iron.

When I selected the subject of Russian industrial art for my paper before this Society, I had in view to say something of those village industries to which passing allusion has been made in the foregoing paper, and which I had seen in Little Russia when I visited it in 1888. The so-called *kustarny promysl* in olden times gave employment to many families, and was not confined to one branch of industry or to any particular locality, but comprised textile, ceramic and other industries, and was widespread throughout Russia. Large manufactories and capitalists have put an end to it, but there still survive, in a few out-of-the-way towns or villages, some remnant of these bygone industries.

It was in one of these old-fashioned places that I happened to find myself. The particular village to which I refer is Oposhnia, in the government of Poltava, a great cereal-producing region, and interesting from its having once been the borderland of Russia. It was here that the Cossacks fought against Tartar, Pole and Swede; this, too, was the country of Gogol, the great romance writer of Russia, and it was on these wide plains, now covered with waving corn, that Russia first learnt to become a nation.

The village of Oposhnia is a large one (according to old records it was a town as far back as the twelfth century), and numbers 700 houses at the present day, inhabited by the descendants of those Cossacks who fought under their hetmans, Daroshenko and Briukovetsky. These Cossacks, long since become peaceful settlers, turned their talents to the ceramic art. They are celebrated, too, as horticulturists. Nowhere have I seen more beautiful irises than were growing at the time of my visit in the chief magistrate's garden. Possibly the Oposhnians have imitated the colours of these flowers on their ware, for I noticed a remarkable iridescent lustre about their pottery which I have not seen elsewhere except in Spain. The clay they use is an excellent kaolin obtained in the neighbourhood; this is fashioned by hand into the common dish in universal use in Little Russia, and known there as the *miska*. The design is simple but effective; only three colours are used, prepared from metallic oxides, and laid on the revolving plate in concentric rings, with the aid of a feather fixed into a horn handle; the ground is afterwards stippled in by hand with a brush.

Professor Zankévitch, who has made a study of this art,

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says that he found no pottery to equal it except in Switzerland. I found some like it near Seville, but, whatever its origin, the art is one well worth preserving. Besides the ordinary ware of everyday use, the Oposhnia potter occasionally indulges a flight of fancy, and produces some original design, which usually takes the form of a drinking-vessel or bottle to hold spirits. These are curious rather than artistic in shape, though showing ingenuity and skill in the manufacture.

From a few words of conversation with one of these handicraftsmen, I learned that times were not so good as they had been when the local consumption took all his produce. The middleman, that curse of the individual craftsman, had stepped in and undersold him in the market, so that the industry was on the decline.

One more of the village industries of Little Russia must here be mentioned. This is the embroidered *plakhta*, or skirt of many colours, worn by the Little Russian women on holidays. A fashion for these had lately set in, owing to the Empress of Russia having hung one of the rooms of her palace with them. The shirtfronts, or *merejniki*, embroidered with Greek crosses in red thread, are another distinctive feature of the national dress. Shortly before my visit, some French travellers, passing through the country, were so captivated by these shirtfronts that they took specimens away to reproduce in the workshops of France.

A few more words on the future of Russian industrial art. We have seen how it has hitherto largely partaken of a religious character, jealously guarded and controlled by the priesthood and synodal authorities, how this art has become stereotyped or petrified through many centuries of imitation; how intercourse with the West has slightly modified the archaic type of iconography, without, however, emancipating it from tradition. We have seen, too, how Western influences are pervading manufactures, and teaching Russia to make use of her immense material resources. Imbued with these Western feelings, a new school of art has sprung up. Sculpture, hitherto almost forbidden, is now taking a high position, and producing such works as those of Antokolsky, whose statue of Ivan the Terrible was exhibited some years ago in the Kensington galleries, and who has more recently modelled another historical subject, in the seated figure of Nestor, the annalist, of Lieberich and Lanceray, whose spirited groups of horses in bronze have been greatly admired. Among painters, too, there are already many known names, such as Vereschagin, the brilliant realistic artist of Central Asian life and landscape,

Semiradsky, Makovsky, the brothers Sokoloff, and a score or two more.

Stimulated by the exhibitions held at frequent intervals in St. Petersburg and Moscow, and by the Stroganoff school of design in the last-named city, Russian art may have a future; but, whether inspired by the French or the Italian school, the subjects must be thoroughly Russian. They must depict in true colours native life and character, in every part of the vast and varied empire.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

9687. George William Chambers, for "Improvements relating to stove-grates and other fireplaces."

9941. Arthur Raymond Tonks, for "Improvements in padlocks, night latches, mortice locks, and other locks, and in the manufacture of the cases of the same."

9724. James Clark, for "Improvements in firegrates or stoves."

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9737. John Deeble Michell, for "Improvements in sash-fasteners."

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9794. Charles Hattersley, for "Improvements in and connected with fireplaces."

9807. Lewis Du Bois and Melvin Le Grand, for "Improvements in devices for locking drawers, doors, &c."

9841. Frederick William Durham, for "Improvements in hinges."

9911. James William Martin, for "Improvements relating to window sashes."

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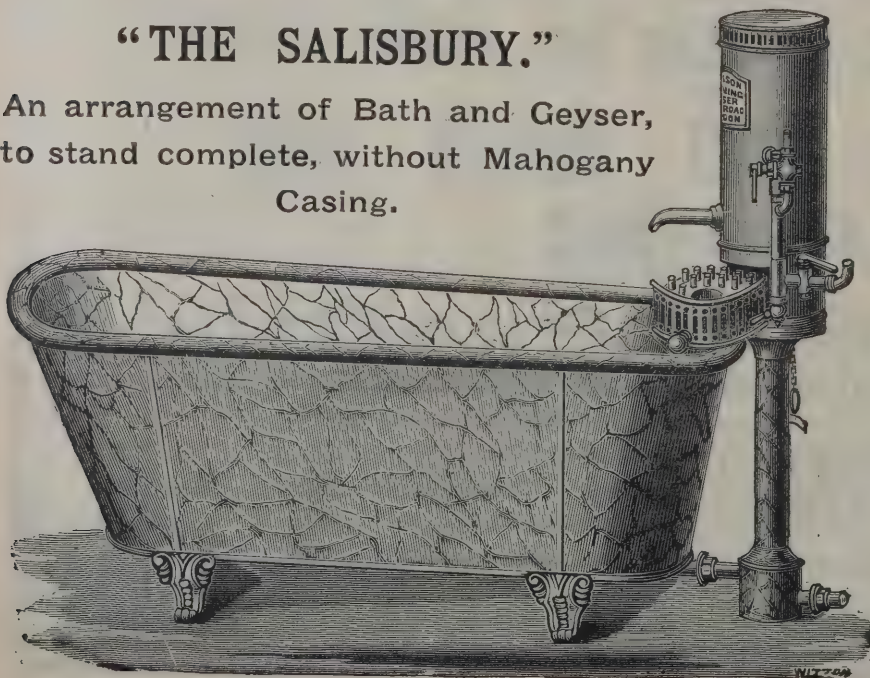
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The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

COMPETITIONS OPEN.

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MONMOUTH.—July 1.—Premiums of 30 and 20 guineas are offered for schemes for Disposal of Sewage. Mr. T. R. Oakley, Town Clerk, Monmouth.

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WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50l. and 25l. Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10l. Mr. Horatio Brevitt, Town Hall, Wolverhampton.

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ACCINGTON.—June 26.—For Building Technical School. Mr. Henry Ross, Architect, Birch Street, Accrington.

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ATHERTON.—June 12.—For Building Liberal Club. Mr. J. C. Prestwich, Architect, Church Lane, Leigh.

BIDEFORD.—June 14.—For Constructing Filter Beds at Waterworks. Mr. B. Latham, 13 Victoria Street, Westminster.

BRADFORD.—June 12.—For the Works in Building Warehouse, Clifford Street. Messrs. Milnes & France, Architects, Bradford.

BRIDGEND.—June 30.—For Construction of Retort-house, Retort-arches, Chimney-stack, Coal-store, &c. Mr. J. H. Dyer, Secretary, Gas and Water Company, Bridgend.

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CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CHELMSFORD.—June 12.—For Building Warehouse, Show-room Offices and Shops. Mr. F. Chancellor, Architect, Chelmsford.

COCKERMOUTH.—June 12.—For Building Police Station. Mr. G. D. Oliver, Architect, Carlisle.

COLCHESTER.—June 19.—For Building Pavilion Shed at Castle Park. Mr. H. Goodyear, Borough Engineer, Colchester.

COLCHESTER.—June 24.—For Construction of Engine and Boiler Houses, Chimney Shaft, &c., Additions to Waterworks Superintendent's House, &c. Mr. C. E. Bland, 12 Crouch Street, Colchester.

EAST MOLESEY.—June 21.—For Constructing Sewers, Building Engine and Boiler-houses, Precipitation Tanks, &c. Mr. J. C. Melliss, 232 Gresham House, Old Broad Street, E.C.

GLASGOW.—June 15.—For Construction of Basement Floor of proposed Art Galleries, &c., Kelvingrove Park. Messrs. Simpson & Milner Allen, Architects, 10 New Inn, Strand, W.C.

HANWELL.—June 12.—For Sewering and Making-up Roads. Mr. S. Barnes, Local Board Offices, Hanwell, W.

HORNCASTLE.—June 10.—For Decorating Chapel. Mr. J. Chatterton, Spilsby Road, Horncastle.

HORNSEY.—June 12.—For Additional Furnaces at Sanitary Dépôt. Mr. T. de Courcy Meade, C.E., Local Board Offices, Southwood Lane, Highgate, N.

HUDDERSFIELD.—June 22.—For Taking Down and Rebuilding Premises, Victoria Lane. Messrs. John Kirk & Sons, Architects, Huddersfield.

KINGSLEY.—June 10.—For Building School and Alterations to present School. Mr. Larner Sugden, Architect, Leek.

LEICESTER.—June 24.—For Two Triple Expansion Pumping Engines. Mr. J. B. Everard, Engineer, 6 Millstone Lane, Leicester.

LONDON.—June 9.—For Supplying and Fixing Wood and Stone Working Machinery. Mr. H. De la Hooke, County Council, Spring Gardens, S.W.

MEOPHAM.—June 15.—For Building Pair of Villas. Messrs. Stenning & Jennings, Architects, Canterbury.

MOULSFORD.—June 16.—For Building Isolation Hospital. Mr. E. T. Hine, Architect, 35 Parliament Street, Westminster.

NEATH.—June 22.—For Building Intermediate and Technical School. Mr. D. M. Jenkins, Architect, Gwyn Hall, Neath.

NEWMARKET.—June 15.—For Additions to Ashley Hall, for Lord North. Mr. Frank Whitmore, Architect, 21 Duke Street, Chelmsford.

ROCHESTER.—June 15.—For Supplying Tooled York Stone Paving. Mr. W. Syms, 58 High Street, Rochester.

ROTHERHAM.—June 12.—For Additions, &c., to Infirmary. Messrs. Newman & Newman, Architects, 31 Tooley Street, London Bridge, S.E.

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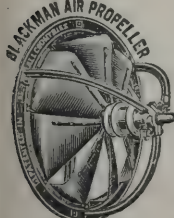
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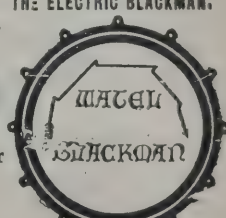
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SOUTHWARK.—June 15.—For Building Casual Wards. Messrs. H. Jarvis & Son, Architects, 29 Trinity Square, Borough, S.E.

STONE.—June 12.—For Building Kitchen Boiler, Chimney Stack, Bathroom, Lavatory, &c., at Workhouse. Mr. J. J. Chapman, Architect, Walton, near Stone.

STONEV STANTON.—June 24.—For Supplying and Laying Cast-iron Socket Mains, Sluice and Air Valves, Wall Fountains, "Torrent" Filter, &c. Mr. S. Preston, Church Street Hinckley.

SWANSEA.—June 12.—For Construction of Brick Sewer; also Iron Pipe Sewer in Bed of the River Tawe. The Borough Engineer, Guildhall, Swansea.

SWANSEA.—June 12.—For Laying Brick and Iron Pipe Sewers. Mr. J. Thomas, Guildhall, Swansea.

TUNSTALL.—June 8.—For Making Up Streets. Mr. A. R. Wood, Town Hall, Tunstall.

WESTMINSTER.—June 21.—For Constructing Underground Convenience, Laying Wood Paving and Asphalte, and Building Stabling and Depôt. Mr. G. R. W. Wheeler, Town Hall, Westminster.

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S. & W. Pattinson, Whitehall, S.W.	£3,300	0	0
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George Hooper, Acton	2,987	0	0
S. N. Soole & Son, Richmond, Surrey	2,725	0	0
Thomas Nye, Ealing	2,713	0	0
George Lyford, Shepherd's Bush	2,680	0	0
JOSEPH DOREY & Co., Brentford (accepted)	2,500	0	0

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For Construction of Impounding Reservoir, Harlock, for the Barrow-in-Furness Corporation.

C. O. Bullough & Co., Ulverston	£23,143	9	3
E. Tempest, Matlock Bridge	22,756	11	1
W. Bradley, Millom	21,986	15	2
Borough engineer's estimate	23,500	0	0

BRISTOL.

For Construction and Supply of Four Pairs of Gates and Iron Railings, St. Andrew's Park, Bristol. Mr. F. ASHMEAD, Borough Engineer.

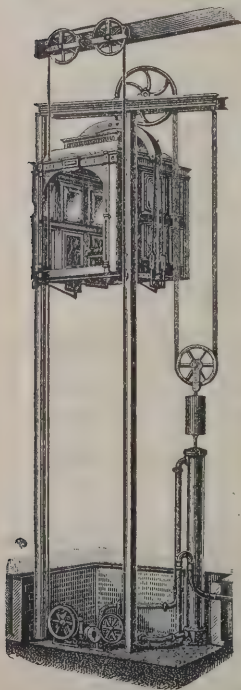
G. Wragge, Salford	£1,180	0	0
J. H. Pye, Moreton-in-Marsh	721	0	0
St. Pancras Ironworks Co., London	616	0	0
W. Parham, Bath	586	0	0
E. Worrall & Co., Liverpool	555	0	0
W. A. Baker & Co., Newport	535	0	0
G. Smith & Co., Glasgow	527	0	0
G. B. Smith & Co., Glasgow	524	0	0
E. J. Raybould & Co., Workington	497	0	0
Barnard, Bishop & Barnards, Norwich	490	0	0
Gardner, Sons & Co., Bristol	436	0	0
S. Harrison, Bristol	420	0	0
Hill & Smith, Brierley Hill	418	0	0
Murdoch & Cameron, Glasgow	418	0	0
W. H. Wharton, Chesterfield	415	0	0
Lion Foundry Co., Kirkintilloch	409	0	0
Hills Bros., Alloa	393	0	0
Sampson & Sons, Bristol	379	0	0
F. & R. Edbrooke, Bristol	360	0	0
J. PRIEST & SON, Limited, Bristol (accepted)	340	0	0

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Wm. Hoare, Bournemouth	£3,179	0	0
J. W. Lucas, Bournemouth	3,150	0	0
Jenkins & Sons, Bournemouth	3,139	0	0
T. H. Kingerlee, Oxford	2,967	0	0
George & Harding, Bournemouth	2,914	0	0
Entwistle & Cox, Bournemouth	2,780	0	0
W. H. C. CURTIS, Poole (accepted)	2,765	0	0

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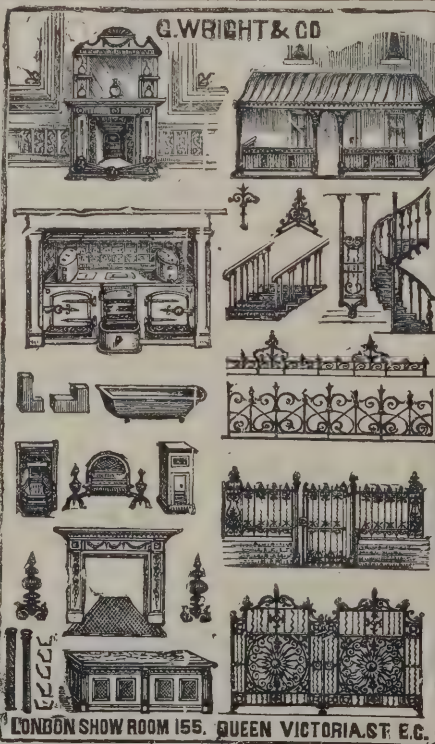
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W. Martin, Ramsgate £1,015 0 0

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T. J. Stammers, Southminster 195 5 0
C. READ, Burnham (accepted) 189 0 0

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J. Hughes, Carnarvon £340 0 0
D. Williams, Carnarvon 310 0 0
R. Jones, Llanwnda 292 0 0
J. Ethall, Carnarvon 280 10 0
E. PARRY, Carnarvon (accepted) 279 0 0

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A. Bullock 2,367 0 0
Bullock & Co. 2,300 0 0
M. Taylor 2,280 0 0
Bryan & Son 2,207 0 0
Young & Lonsdale 2,190 0 0
E. J. SAUNDERS (accepted) 2,186 0 0

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Pillar & Sons, Dartmouth £823 0 0
E. Veale, Dartmouth 800 0 0
C. Veale & Anderson, Dartmouth 758 18 0

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Gibson, Durham £172 11 3
Talbot, Durham 159 16 9

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For Construction of Covered Service Reservoir, Craiglockhart, for the Edinburgh and District Water Trustees. Messrs. J. & A. LESLIE & REID, Engineers, Edinburgh.
W. Gerard, Edinburgh £9,451 0 0
G. Lawson, Edinburgh 9,170 0 0
G. & R. Cousin, Alloa 8,725 0 0
J. Shaw, Leith 8,707 0 0
Turner & Sons, Edinburgh 8,215 0 0
R. C. Brebner, Edinburgh 8,152 0 0
W. Beattie & Sons, Edinburgh 7,806 0 0
W. Wallace, Edinburgh 7,130 0 0
Henderson & Duncan, Edinburgh 6,999 0 0
J. YOUNG & SON, Edinburgh (accepted) 6,956 0 0

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Perrin & Long, Sutton 7,488 7 5
Lloyd & Powell, Bristol 7,367 10 4
W. Gibson, Exeter 7,086 16 2
W. PERRY, Exmouth (accepted) 6,801 12 6

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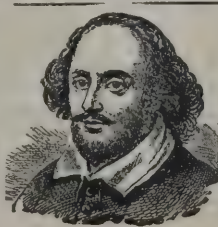
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W. Kirkby, Newark	189	0	0
G. Henderson, Newark	185	0	0
F. CROSSLAND, Newark (accepted)	183	0	0

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Bearcroft & Wilkinson, Eston	3,988	10	0
A. J. Cooke, Stockton	3,798	0	0
J. Howe, West Hartlepool	3,685	0	0
F. Young, Guisborough	3,569	11	0
J. G. Robson, West Hartlepool	3,551	11	4
T. Dickinson, Middlesborough	3,550	0	0
W. C. Atkinson, Stockton	3,502	18	3
J. Coates, Marton	3,434	14	0
J. Johnson, Middlesborough	3,424	10	0
Allison Bros., Middlesborough	3,385	0	0
E. Cruddas & Son, Guisborough	3,339	4	8
Bastiman Bros., Middlesborough	3,312	0	0
C. Haswell, Guisborough	3,251	9	6
W. Heckle, Guisborough	3,250	0	0
G. M. RADGE, Normanby, Middlesborough (accepted)	3,235	0	0

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B. A. Hamer, Kington	£1,957	5	0
R. Morgan, Kington	1,930	6	9
C. Edwards, Leominster	1,550	0	0

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J. McKnight & Son, Uphall	14,199	17	7
R. C. Brebner, Edinburgh	13,953	0	0
Henderson & Duncan, Edinburgh	13,531	11	6
G. Mackay & Son, Broughty Ferry	12,903	16	0
R. B. Steuart, Beith	12,776	9	0
R. Gilmour, Strathmiglo	12,360	18	4
R. R. Gordon, Bathgate	12,239	9	0
T. PEATTIE, Bowness (accepted)	11,923	0	6

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J. Young & Sons	5,928	2	11
Henderson & Duncan	5,344	1	9
R. B. Steuart	4,751	6	3
G. Mackay & Son	4,676	9	5
R. Wallace	4,386	0	0
J. McKnight & Son	4,308	13	0
R. C. Brebner	3,977	13	9
R. Gilmour	3,558	14	4
D. Purves & Co., Edinburgh	3,189	0	0
T. PEATTIE (accepted)	3,035	0	0

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R. Laidlaw & Son, Glasgow	11,523	2	6
R. MacLaren & Co., Glasgow	11,505	0	8
Macfarlane, Strang & Co., Glasgow	11,336	3	6
Cochrane, Grove & Co., Middlesbrough	11,234	3	8
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W. W. Learmouth, Portsmouth	1,599	2	4
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William Molyneux, Ashcroft Street, St. Helens	4,020 0 0
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Thos. Haigh, Fraser Street, Liverpool	3,750 0 0
G. L. Desoer, Everton Road, Liverpool	3,695 0 0
Morrison & Sons, Wavertree, Liverpool	3,660 0 0
Brown & Backhouse, Chatham Street, Liverpool	3,642 0 0
W. H. Bleakley & Co., Market Street, Birkenhead	3,636 0 0
Thomas F. Hill, Woolton, Liverpool	3,599 15 0
S. Webster, Bootle, Liverpool	3,565 0 0
John Lucas, Prescott, Liverpool	3,560 0 0
W. Tomkinson & Sons, Dansie Street, Liverpool	3,547 0 0
J. Paterson & Son, Soho Street, Liverpool	3,529 0 0
Peter Taylor, Prescott, Liverpool	3,526 0 0
R. H. Davies, Boundary Road, St. Helens	3,500 0 0
J. ROTHWELL & SONS, Knowsley Road, St. Helens (accepted)	3,425 0 0

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W. Neil, Burdett Road, E.	£803 12 0
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J. Holland, Leytonstone	468 0 0
White & Son, Bow	445 15 0
B. HOBBS, Ilford (accepted)	397 0 0
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JONES & WILLIS (accepted)	£80 0 0
For New Shops and Flats, Cambridge Road, for Mr. F. Newton. Messrs. CREWE & SPRAGUE, Architects, Fitzalan House, Arundel Street, Strand, W.C. Quantities by Messrs. BRUNSDEN & HENDERSON, 47 Pall Mall, S.W.	
GEO. VEALE & Co. (accepted)	£2,160 0 0

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For Alterations, Redecorations, &c. at the New Olympic Music Hall. Messrs. CREWE & SPRAGUE, Architects, Fitzalan House, Arundel Street, Strand, W.C.	
Allard & Sons	£3,500 0 0
GEO. VEALE & Co. (accepted)	2,350 0 0
For Alterations and Fitting Rooms, &c., at 70 New Bond Street, for Messrs. Russ & Co. Mr. ERNEST H. ABBOTT, Architect, 6 Warwick Court, High Holborn, W.C.	
J. Anley	£295 0 0
Hall, Beddall & Co.	293 0 0
For Structural Alterations, Sanitary and Decorative Works, at 6 Craven Hill, W. Mr. DELISSA JOSEPH, F.R.I.B.A., Architect, 17 and 18 Basinghall Street, E.C.	
Watson Bros.	£1,149 0 0
G. H. & A. Bywaters	1,120 0 0
C. F. Kearley *	983 0 0

Electric Lighting.

SPAGNOLETTI & CROOKES (accepted)	£70 0 0
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* Accepted as reduced at £847.

For Cleansing and Painting certain Wards at the Infirmary, High Street, Homerton, for the Guardians of the Hackney Union. Mr. W. A. FINCH, Architect, 76 Finsbury Pavement, E.C.	
Mr. Flaxman	£238 0 0
Mr. Shepherd	227 0 0
BRUCE & MIDDLETON, Stamford Hill (accepted)	203 0 0

ST. ALBANS.

For Building Police Station, St. Albans. Mr. GEO. FORD, City Surveyor.	
J. & W. Savage, St. Albans	£1,360 0 0

SUNDERLAND.

For Building Asylum at Ryhope, Sunderland. Mr. GEORGE T. HINE, F.R.I.B.A., Architect, 35 Parliament Street, S.W. Quantities by Mr. G. CONNELL, Newcastle-on-Tyne.	
JOSEPH HOWE, West Hartlepool (accepted)	£61,240 0 0

THE Birmingham School Board have decided to raise a loan of 14,647*l.* from the City Council for the purpose of providing for the cost of the site and schools in Somerville Road, Small Heath.

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Exeter Cathedral	Eddystone Lighthouse
Llandaff	Birmingham Municipal Buildings
Wells	Hove Town Hall
Sligo	Burnley, Holy Trinity Church
Bradford Town Hall	Crawley Parish Church
St. James's Palace, London	Corbridge-on Tyne Parish Church
Sherborne Abbey	Windermere Church
Sydney Town Hall, N.S.W.	Durban Town Hall, S.A.
Royal Military Exhibition, &c., &c., &c.	Eiffel Tower, Paris
GOLD MEDALS—HUDDERSFIELD, 1883; LONDON, 1886.	
SILVER MEDAL—PARIS 1889.	

TRADE NOTES.

TENDERS were considered by the tramway committee of the Glasgow Corporation for the supply of 1,000 tons steel rails and fish plates. The offers included the following:—Messrs. Dick, Kerr & Co., London, rails 4½. 18s. 6d. per ton, plates 4½. 18s. 6d., delivered on quay, Glasgow; Darlington Steel and Iron Company, rails 5½. 1s., fish plates 5½. 1s., delivered at Glasgow station; and the Steel Company of Scotland, rails, 5½. 2s. 6d., fish plates, 7½. 5s., free on trucks, South-Side station, London Road station, or General Terminus. It was proposed that the tender of the first-named firm should be accepted, but an amendment to accept that of the Steel Company of Scotland was carried. When the minute came before the Corporation for adoption, it was resolved by a majority of 41 against 6 to accept the tender of Messrs. Dick, Kerr & Co.

ON Wednesday, the 14th inst., will be put up to auction some freehold land, in large and small sized lots, to be sold on the instalment plan at Gough Park, Enfield. According to the prospectus there are sixty-five beautifully wooded plots on the Forty Hill, Cheshunt, and Clay Hill Roads, and on a new road through the property. Gough Park, with its ancient mansion, its pleasure grounds, its waters and magnificent timbering, was formerly the luxurious country house of an eighteenth-century city merchant, and many of the prominent ornamental features of the estate will be retained for the benefit of purchasers. The Great Northern and Great Eastern railways both have trains running direct to Enfield, so that all intending bidders can easily attend the sale without inconvenience.

THE Edison & Swan United Electric Light Company, Limited, inform us that they are now able to undertake at their works in London, silver plating, nickel plating, and gilding, and are prepared to do such work in quantity at prices compatible with good workmanship and quality.

THE *Liverpool Journal of Commerce* understands that the contract for the extension of the Overhead Railway from the new Rimrose wall to Crosby Road, opposite the Caradoc Hotel, has been let to local contractors, Messrs. Holme & King.

IN reference to the great fire at the timber yard in Walnut Tree Walk, Kennington Road, Mr. T. Forman desires us to state that, although the stock was totally destroyed at Kennington, all orders are being promptly executed from stocks held at the docks and saw-mills.

THE Midland Railway Company's announcement of *table d'hôte* dinners in railway trains, to commence both in first and third class carriages next month, is more of a new departure than it even appears to be, as the work will be done entirely by the use of compressed oil-gas in cooking apparatus specially designed by Messrs. Fletcher, Russell & Co., Limited, at their Warrington house. The gas is carried in cylinders under the saloon, and it is intended to use the same fuel also for warming the carriages in winter. The use of ordinary coal-gas for cooking and heating has spread rapidly for many years past, but the use of oil-gas, of high illuminating power, for this purpose, is at present very unusual, and for railway dining saloons the Midland Company has made the first successful attempt. The running trials have been made some time ago, and the whole arrangements proved quite perfect in every respect the first time the burners were lighted, although they had been designed by Messrs. Fletcher, Russell & Co. from theoretical calculations alone.

THE Works Committee of the Edinburgh and District Water Trust have accepted Messrs. Laidlaw & Co.'s tender, which was the lowest, for cast-iron pipes for the new reservoir at Craiglockhart, amounting to 788½. 15s. 9d.

THE Exmouth Water Company have of late been engaged in an extension of their water area. The taking of this water supply for the town of Exmouth will cut off the motive power from the Bicton Saw Mills, and a large reservoir has to be constructed as compensation. Tenders for the work have been received, and that of Mr. Perry accepted subject to the approval of the engineer, Mr. Cousins.

THE Buildings Committee of the Aberdeen School Board have accepted tenders for the works of the extension of the school in Marywell Street amounting to 1,352½.

THE Highways Committee of the Carlisle City Council have decided to obtain tenders for altering Low Keekle Bridge. They have accepted the tender of Mr. William Dixon for the erection of a new stone bridge at Wellington.

THE Bridgnorth Town Council have empowered the Watch Committee to accept the tender of Messrs. Merryweather & Sons for a steam fire-engine.

AT the meeting of the Worcester City Council the Watch Committee's proposals for making better provision for fire extinction were adopted after considerable discussion. The scheme involves an outlay of 498½. in hose and incidentals.

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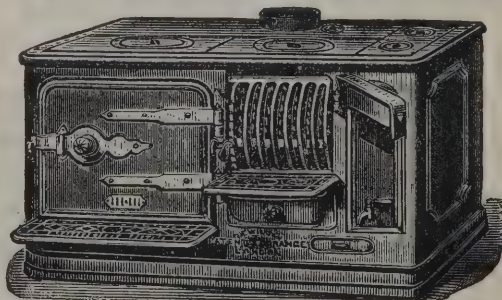
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At the meeting of the Stafford Town Council the Gas Committee recommended the laying of new and larger mains from the works to the centre of the town, and the reconstruction of the retort-house. The estimate for the former was 500*l.*, and for the latter 3,000*l.* The recommendation was adopted.

THE Belgian States Railway have ordered from the Lamp Manufacturing Company, Limited, the patent Coligny gas lamp for lighting the whole of their international cars, as well as the state carriage of the king and the post-office vans, and it is anticipated that they will adopt them for the whole of their service.

VARIETIES.

WE are able to state that Messrs. Perken, Son, & Rayment have just issued the prospectus of the Optimus (1893) 100 guinea competition, containing the conditions of competition and application form for entry. The 100 guineas are allotted in prizes of 10*l.* and 5*l.*, or photographic apparatus of those values.

The Improvements Committee of the London County Council have reported in favour of widening the southern end of Tottenham Court Road. The Committee, it is stated, propose that the owners of property on the western frontage shall contribute to the cost, as the property will acquire enhanced value.

THE *Irish Times* says:—The afforesting carried out by the Congested Districts Board in the West of Ireland is now beginning to show the beneficial effects that in the future will be reaped by this important step. At Knockboy, Recess, co. Galway, the works carried out there are proving very encouraging, and the large number of young trees that have been planted show a fine healthy growth this season. The weather seems to have suited them well, and the varieties selected, from their vigorous appearance, seem well adapted for the western climate. All vegetation is fresh and luxuriant.

Stone of Indianapolis says:—There has been at Pittsburgh some complaint among the architects that owing to the long and severe winter we have had, work was entirely suspended on several large buildings here in the city and vicinity, but within the last six weeks building operations have been very active. Indications are that architects, dealers in material,

and contractors will have a very good season, as most of them have already secured about all the work they can perform during the building season. Prices for material are steady, and afford a fair profit to the dealers. Carpenters, bricklayers and stone-masons all seem to have regular employment, and there is no agitation of the wage question between employers and employes, and everything points to a busy and profitable season. Pittsburgh has had completed within the past eighteen months some very creditable and substantial buildings.

THE same journal adds:—George McMullen, well known in Minneapolis and the North-west as a pioneer resident and stone-contractor, died at his home in Minneapolis, May 8. His death was very sudden, there being but a few moments' warning. Mr. McMullen was a resident of Minneapolis for upwards of forty years, and was about eighty years old. He came here from Canada, and followed his trade, that of stone-mason. Before long he was given many of the large stone contracts. He built several of the large mills in Minneapolis, and also did considerable bridgework for railroads.

A BLOCK of warehouses in Grundy Street, Liverpool, in which were stored a large quantity of cotton and grain, has been destroyed by fire. The damage is estimated at 15,000*l.*

LAND and premises in Watergate, Dewsbury, have been purchased by the Dewsbury Corporation for 1,700*l.*, as a site for a refuse-destroyer.

THE foundation-stones of a new pier at Rhos, Colwyn Bay, have been laid. A new road from the pier is being constructed along the sea front, which will open up one of the finest building estates in the principality, connecting Llandudno and Colwyn Bay by a marine drive.

THE *Glasgow Herald* says:—Arrangements were made for the operative masons of Glasgow contributing one shilling each on the first pay day in June, the proceeds to go to the fund for the erection of New Art Galleries. In this way the masons will have a stone in the new galleries.

At a public meeting just held at West Hampstead it was decided to form a deputation to request the President of the Local Government Board to appoint a commission to investigate the present mode of ventilation of the main sewers in West Hampstead.

At the monthly meeting of the York City Council the Estates Committee recommended that, after consideration of the report of Mr. A. Waterhouse, R.A., as to the best method of dealing with the surplus land at the corner of Blake Street and

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Duncombe Place, that no buildings to be erected upon the land should project beyond the line of the Wills Office. Mr. Foster stated that in 1865 the citizens subscribed 8,500*l.* towards opening out the view of the Minster, and he felt sure they would now subscribe the amount necessary to remove the Wills Office and open out the view of the Minster from Blake Street. The matter was adjourned until the next meeting.

THE *Birmingham Post* says:—The deputation of the Markets and Fairs Committee have returned from their visit of inspection of the most modern and improved markets in several of the large towns of Germany, including Berlin, Leipzig, Hanover, &c. The sub-committee have obtained very valuable information, consisting of the details of management, mode of work and plans of the different markets, &c. They are of opinion that the public slaughter-houses and markets on the Continent are very much ahead of anything we have in this country, and that the information obtained will be most valuable in the construction of the new meat market and public slaughter-houses. It is the sub-committee's intention to embody the result of their visit to Germany in a detailed report to the committee.

THE borough surveyor of Walsall has just issued his report, which covers thirty pages in pamphlet form. The total length of the streets and roads now in the borough is about 26 miles 3 furlongs 37 yards.

AT the meeting of the sub-committee of the Plans and Works Committee of the Edinburgh Town Council, arrangements were made for the reception of the American team of firemen. It was resolved that on the day of the visit of the strangers there should be a demonstration by the Edinburgh Fire Brigade in Parliament Square, a drive through the city and to the Forth Bridge, and a luncheon to the party in the City Chambers.

BUILDING AND BUILDERS.

ON May 24 a new centre for manual instruction and instruction in cookery for the pupils of the Church Schools in Birmingham was opened in Bath Row by Sir Alexander Mackenzie, K.C.S.I., Chief Commissioner of Burma. The centre is one of a number which the Birmingham Church Council is endeavouring to provide. The premises adjoin the schools of the church of St. Thomas, and include a cookery school accommodating 76 girls for demonstration and 24 for practice, and a manual

training school fitted with benches, lathes, and tools for 22 boys. Adjoining the cookery school is a house for resident pupils. Additional class-rooms have also been built, and new playgrounds formed, for the exclusive use of the schools of St. Thomas. The buildings have been designed, erected, and fitted up under the direction of Mr. F. B. Osborn, architect, of Birmingham.

CHURCH restoration work is to be carried out at Long Sutton, near Spalding, South Lincolnshire. The contract has been obtained by Messrs. Cornish & Gaymer, of North Walsham, and the work will be at once proceeded with. Mr. Bassett Smith, of London, is the architect. Long Sutton possesses one of the finest old churches in the district.

THE foundation-stone has been laid of the new municipal offices at Bath; Mr. J. M. Brydon, architect, and Messrs. Hayward & Wooster, builders.

THE town-hall and market built from the designs of Mr. Thomas Rowlands, architect, has just been opened at Pontypridd.

THE Glasgow Town Council have approved of the minutes of the sub-committee on the rebuilding of Glasgow Bridge. The estimated cost of re-erecting the structure at the east end of Govan Street was from 51,000*l.* to 55,000*l.* It would be necessary to sink the foundations 90 or 100 feet below the bed of the river.

THE Edinburgh Dean of Guild Court have granted a warrant to Mr. William Wilson to take down certain buildings at Riddell's Court, Lawnmarket, and to build on the site a double tenement of dwelling-houses. These buildings, which are to be erected from designs by Mr. S. Henbest Capper, A.R.I.B.A., are to be of harled front, with projecting timber windows, somewhat in the style of Old Edinburgh, and promise to be rather an ornament to the thoroughfare.

THE Court also gave authority to Mr. W. J. Menzies, W.S., agent for the Church of Scotland, to carry out the extension of the General Assembly Hall. It is proposed to remove the wall which at present bounds the Assembly Hall at its western end, opposite the Throne Gallery, and to carry the interior as far back as the real gable wall of the structure, through which access is at present had to the library. The present library buildings are to be taken down; a site for the library is to be found on the ground immediately to the south, towards Johnston Terrace; and the additional space available is to be utilised for the erection of refreshment-rooms, waiting-rooms, &c.

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THE Birmingham City Council have approved of the recommendation of the Museum and School of Art Committee to expend 630*l.* in the provision of a new staircase and extending the iron gallery around the industrial hall of the Art Gallery. The Public Works Committee were authorised to arrange for the construction of a storm-water conduit, for the relief of sewers in Ladywood Ward, at an estimated cost of 4,875*l.*, and for additional stabling, granaries, &c., at the Holliday Street Wharf, at an estimated cost of 6,000*l.*

THE Coventry City Council have approved of the recommendation of the Estates Committee for the extension of the County Lunatic Asylum at Hatton. Mr. Edward Mansell, architect, of Birmingham, approximately estimates the cost of the necessary works at 30,360*l.* To this there must be added a sum, which the Visiting Committee estimate at 7,500*l.*, to cover heating and ventilation, architect's commission, wages of clerk of the works, and extras—38,000*l.* in all.

IN regard to the proposed infectious hospital for Leith, Mr. Simpson, architect, has reported as follows:—"I understand the remit to refer to the erection of all the buildings, &c., shown upon the plans, with the exception of two ward pavilions. (1) The estimate of the probable cost of constructing the hospital according to the sketch plans submitted was stated in my report of the 11th ultimo (April) to be for constructing the hospital of stone, 28,800*l.* By not erecting two pavilions at present the reduction would be about 5,110*l.*, leaving probable cost of restricted buildings, &c., to be, if erected with stone, 23,690*l.* (2) Estimate for stone, as above, 23,690*l.*; less, if buildings are erected with common brick, 1,800*l.*—making cost of restricted buildings, if brick, 21,890*l.*" The committee instructed Mr. Simpson to complete his plans for all the erections in connection with the proposed hospital, with the exception of the two pavilions, and to advertise for alternative estimates for the construction of the buildings in stone or brick. The Town Council have adopted the committee's recommendation.

ILLUSTRATIONS.

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HOUSE, BROADSTAIRS.

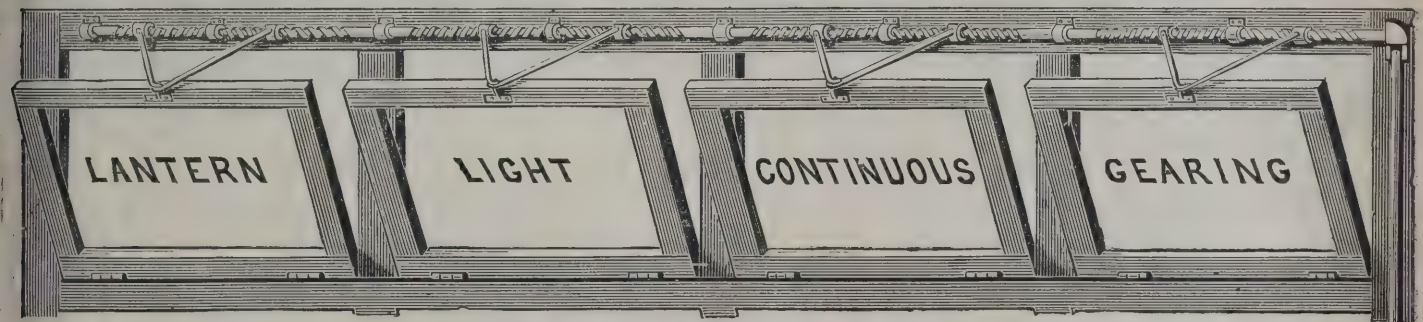
FIBRE FROM THE DWARF PALM IN ALGERIA.

THE *Scientific American* has an article on the above as follows:—The dwarf palm, which furnishes considerable quantities of fibre, grows in great profusion in Algeria, and is one of the principal obstacles to the clearing of the land, so thickly does it grow and so difficult to pull up; its roots, in shape resembling carrots, penetrate into the ground to the depth of a yard or more, and when its stem is only cut it sprouts out again almost immediately. As its name indicates, this palm is very small, and can only attain a certain height when protected, as in the Arab cemeteries, for example.

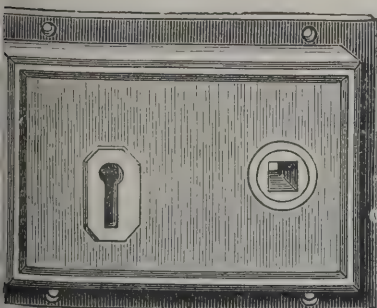
Various uses are made of this plant. Its roots serve as combustibles, a light kind of coal being made out of them, and the natives have employed the fibres that they extracted from the leaves and the stems, mixed with camel hair or wool, in the manufacture of stuffs for tents; with the leaf itself they make baskets, mats, hats, fans, bags, and other articles. Considerable attention is now being paid by the authorities to the encouragement of this industry in Algeria, as, in the first place, it affords to the Arabs an easy means of making a living, and, in the second, the land is thus rapidly cleared of this parasite. The idea of embarking in the industry of fibre production from the dwarf palm originated a few years ago with a landed proprietor living in Cheragas, about eight miles from Algiers. At the present time there are in Algeria numerous establishments which are devoted to this branch of industrial enterprise. The principal factories are those of Aversing, Elaffroun, Chiffa, Duperre, and Douera, and the exports of late years have exhibited a decided increase. In 1880 the quantity of fibre exported from Algeria amounted to 9,000,000 kilogrammes, in 1885 to 15,000,000 kilogrammes, and in 1891 to 19,000,000 kilogrammes.

In preparing the fibre, the following is the system adopted. The leaves are plucked by the Arabs and carried into the courtyard of the factory in a green state, at a price of twenty francs per ton. As they are at once used, and as they fear neither the rain nor the sun, it is only necessary to pile them on the floor in a heap. The first operation consists of sorting, which is effected by women and children. The weeds are removed from the stems which frequently adhere to them, and the broken or dried-up leaves are cut away. Another operation consists in combing the leaves, or rather in carding them. This is effected as follows: A workman holds tightly in his right hand a handful of green leaves which he applies to a

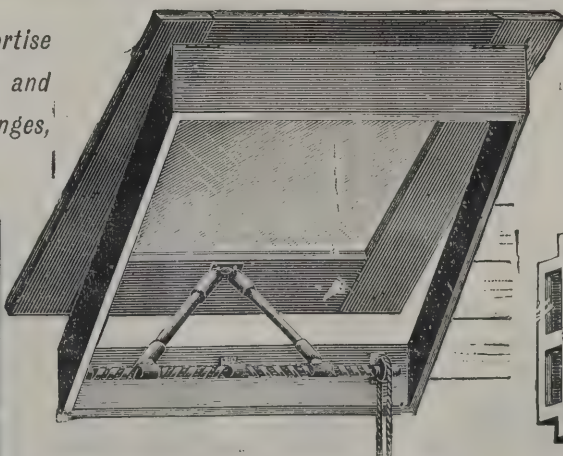
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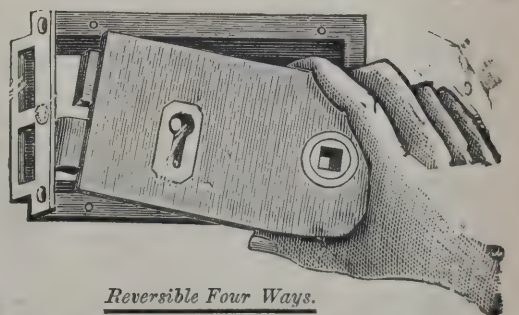
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small carding machine. This machine consists of a drum on which some nails have been roughly fixed, and is constantly turning with great rapidity. To protect the hands of the workman it is incased in wood, with only an opening sufficiently large to admit the leaves. As it is necessary that these leaves should be damped during the work, a tap is placed above the drum, from which a constant stream of water falls upon the leaves. With this most primitive system a workman is able to card from five to six hundred kilogrammes—1,000 to 1,300 pounds—of leaves a day.

When the leaves have been combed at both ends they present the appearance of a handful of rough and short fibre. They are then dried, and after certain preparations are ready for use in stuffing chairs, couches, &c. To curl the fibre, a workman takes up a quantity of carded leaves and applies it to a bent hook fixed upon the axle of a wheel, which is turned by a child. The first fibres accumulate round the hook, and wind themselves round it; the latter, which is constantly turning, draws in the others, and the workman recedes from the wheel while grinding the fibres with his hand. The latter soon constitute a sort of cord, one end of which is fixed to the hook, the other held firmly and horizontally by the workman. At this stage of the proceedings the child who turns the wheel stops and detaches one extremity of the cord, which he returns to the workman, after having passed it round the hook. In this operation the cord is subject to the natural impulse of twisting, and rolls up on itself, so that it is only necessary to fix the ends so that it cannot come unrolled. The fibre is kept in this condition for several weeks, and is then untwisted, and is then considered to be sufficiently curled. African fibre is employed in its natural state or dyed. In the latter case the fibres are passed through various solutions of sulphate of iron and logwood, then curled, and again plunged into the solution.

DEFECTIVE DRAINS.

ON Tuesday, in the Queen's Bench Division—before Justices Mathew and Wright—the case of Levenberg v. Wykes came on for hearing. It was an appeal by the defendant, an architect, from the judgment of the County Court judge at Birmingham after the finding of a jury. The defendant was architect of some houses built in Portland Road, Edgbaston, in 1878, and plaintiff's case was that last year, when there was a nuisance on the premises and the drains were opened, it was found that they had not been constructed in accordance with the plans

deposited with the local authority. An action was therefore brought against the defendant for fraudulently representing that they had been so constructed, and the jury found a verdict for the plaintiff.

Mr. Hugo Young, for defendant, now contended that there was no evidence on which the jury could so find, that defendant had made no representation as to the drains, and that he had altered them in the exercise of his discretion under the contract.

Mr. Turrell, for the respondent, urged that the verdict of the jury must stand, as there was ample evidence on which they could find as they had done.

Mr. Justice Mathew, in giving judgment, said the sole question for the Court was whether there was evidence in the case on which the jury could reasonably find as they had done. He was satisfied that there was that evidence, and he was also satisfied that the learned judge, in his summing up, told the jury the law with great clearness. In fact, he represented the case in such a way that the jury, if they were disposed to take a favourable view of the defendant's conduct, had an opportunity of doing so, but they considered that the plaintiff had made out his case, and so found.

The appeal would be dismissed with costs.

Mr. Justice Wright concurred.

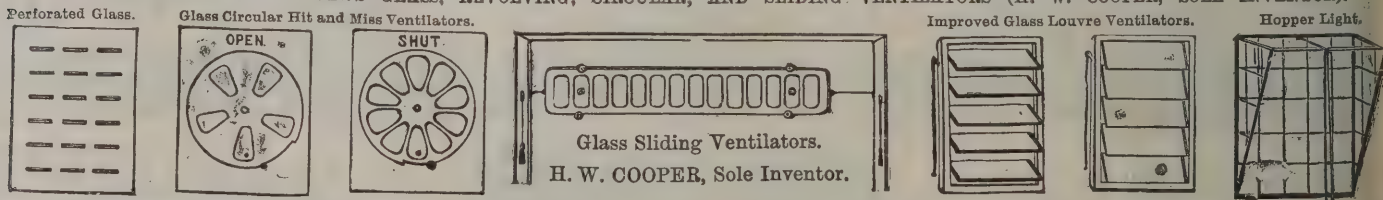
MANCHESTER SHIP CANAL.

THE opening of the Ship Canal to Manchester being so near, the particulars given by the *Manchester Guardian* with reference to the height of the fixed bridges over the Ship Canal may be of interest. Between the entrance at Eastham and Runcorn Bridge (about twelve miles from Eastham) it will be possible for the largest vessels to navigate the Ship Canal provided they have a breadth not exceeding 80 feet—the width of the largest of the three locks at Eastham. A Liverpool writer was in error in stating recently: "It will rather dwarf the importance of the Manchester Ship Canal as a highway for the carriers of produce from beyond the seas when it is known that the funnels of the new Cunarder *Campania* could not possibly pass under the Runcorn Bridge, let alone her masts. Each of these funnels, it is said, is higher than the Eddystone Lighthouse." The funnels of this vessel are about 120 feet high, while the Eddystone Lighthouse is 170 feet high. There is only one dock in Liverpool into which the *Campania* could enter, and that only on a spring tide at high water. It will not, therefore, "dwarf the importance of the Ship Canal" if

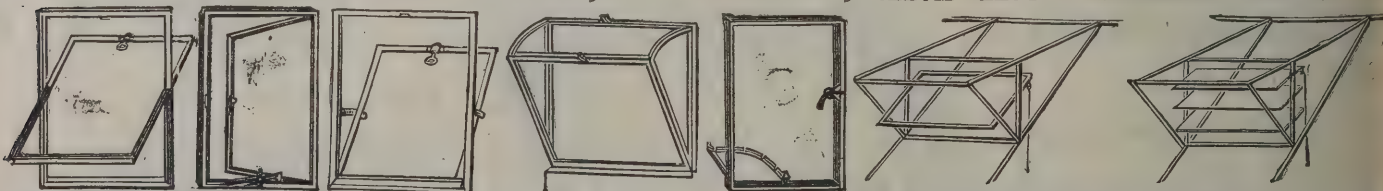


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such large vessels as the *Campania* (620 feet long and 65 feet broad) and the largest of the American liners "cannot possibly pass under Runcorn Bridge," as the bulk of the "carriers of produce from beyond the seas" are steamers or sailing vessels having a less draft than 22 feet, a length of less than 500 feet and a breadth not exceeding 46 feet, the funnels of which steamers do not reach anything like the height of Runcorn Bridge and the other fixed bridges over the canal. Each of these allows a clear headway of 75 feet above ordinary water level. The masts of such vessels can be lowered when entering the canal, so that there will be no difficulty in their traversing the whole length of the canal to Manchester. The advantage of being able to navigate the canal has been, and is still being, found by shipowners and shipbuilders to be so great that their vessels are now being built with masts that can easily be adjusted to pass under all the bridges on the canal. Vessels bringing timber whose masts would not allow them to go past Runcorn Bridge can discharge their cargoes outside into the extensive timber pond at Saltport and take on board salt or coal, &c., for export. South Yorkshire coal, which is much used for bunkering steamers, can be brought into the Ship Canal direct from the Barnsley and other collieries in barges for bunkering at much less cost than at present. Pit-props and other timber are very largely used in the collieries of Wigan, Leigh and other towns in South Lancashire connected with the Ship Canal by smaller canals, and the barges taking such timber could easily bring back coal for export. It certainly does not appear that the Ship Canal will lose much for the seeming difficulty with respect to masts. The steamship *Wensleydale*, 1,160 tons register, one of the Knotts Prince Line of steamers, is a vessel of about the size which will use the Ship Canal to an enormous extent as soon as it is opened to Manchester, without much difficulty in respect of the bridges. There is no reason why steamships such as the following should within a few months have any difficulty in navigating the Ship Canal to Manchester and Salford:—*Cufic* (White Star Line), 4,639 registered tonnage; *Ottoman* (British and North Atlantic Steam Navigation Company), 4,843 registered tonnage; *Columbian* (Leylands), 5,038 registered tonnage; *St. Ronans* (British and Foreign Steamship Company), 4,457 registered tonnage; *Pavonia* (Cunard Line), 5,588 registered tonnage; *Germanic* (White Star Line), 5,008 registered tonnage; *British Princess* (British Shipowners' Company, Limited), 3,936 registered tonnage; *Philadelphian* (Philadelphian Steamship Company), 5,120 registered tonnage.

EDINBURGH CASTLE.

As has been already mentioned, the War Office has resolved to convert the Ordnance Stores at Edinburgh Castle into a hospital for the men of the garrison—the old Parliament Hall, now so happily restored, having been previously used for that purpose. When in London lately the Lord Provost had an interview with the authorities of the War Office, and urged upon them the propriety of their using the 2,000 $\frac{1}{2}$ the Government is to receive from the North British Railway Company for the ground at the foot of the castle slopes (which is leased to the Corporation) to improve the appearance of the buildings on the castle, some of which are far from creditable to the reputation of the city for style, or worthy of the commanding position they occupy in the eyes of all men. In any case his lordship expressed the hope that nothing would be done in connection with the proposed hospital to add further to the disfigurement of this site. The Lord Provost also saw General Lyon-Fremantle, commanding the Scottish District, and the General, who was good enough to interest himself in the matter, wrote to the war authorities on the subject. The Lord Provost a few days ago received from General Lyon-Fremantle the following copy of a letter which had been sent to the General from the Inspector-General of Fortifications:—

War Office, London, S.W. : May 23, 1893.

Sir,—With reference to your letter of the 30th ultimo respecting the conversion of the Ordnance Stores at Edinburgh Castle into a hospital, I am directed by H.R.H. the Commander-in-Chief to acquaint you that the 2,000 $\frac{1}{2}$ compensation referred to will not be receivable by the War Department, but that it is understood that it will be paid to the Office of Woods and Forests.

The Secretary of State for War sympathises with the view of the Lord Provost of Edinburgh as to beautifying the castle, and only regrets that the small amount of the funds available for War Department purposes enables so little to be done in this direction.

Mr. Secretary Campbell-Bannerman has, however, caused a letter to be addressed to the Office of Woods and Forests asking whether that Department would be prepared to assist in the matter.

I am to request that the Lord Provost may be informed accordingly.—I have the honour to be, sir, your obedient servant,

(Signed) R. GRANT,
Inspector-General Fortifications.

In the circumstances, the Lord Provost has, we believe, put himself in communication with the Department of Woods and Forests, and has, at the same time, addressed a letter to

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the four city members detailing the circumstances of the case, and asking their co-operation in the matter. His lordship, we believe, the *Scotsman* says, is prepared, should the Woods and Forests Department agree to spend the 2,000*l.* in the way suggested, to ask the Town Council to make a contribution to a fund for improving the amenity of the castle buildings, and also to invite the co-operation of the citizens in furthering what will be felt by all to be a very laudable object.

NEW MISSION HALL, BOLTON.

THIS building, of which the foundation-stones have been laid, is designed of a perfectly plain but substantial character as to the erection. Provision is made in the basement for a large gymnasium 61 feet by 65 feet, which is lined with brown glazed bricks 4 feet high. Two large labour rooms are also arranged, 57 feet by 30 feet and 26 feet by 44 feet respectively. Two bathrooms are provided, lined with best brown glazed bricks and fitted with baths of the best kind. A soup-kitchen with steam boilers, a kitchen and heating-apparatus room complete the accommodation in the basement. Three entrances are provided to the same from the street's level.

On the ground floor is the large hall, 66 feet by 44 feet, with open pitch-pine roof, and with pitch-pine boarded dado 4 feet high all round. A gallery is also arranged at one end to accommodate about 180 persons, and the body of the hall will hold about 600. On this floor there are also a large infants' room, with gallery, and four classrooms of various dimensions, two of which can be opened to the hall by means of revolving shutters, so as to provide additional space when desired at public gatherings. A private office and the entrance, staircase, &c., with the requisite lavatory accommodation, complete the provision on the ground floor.

On the upper floor is one large classroom, 24 feet by 32 feet, and seven other classrooms of various dimensions. The gallery in the hall is entered at this floor level.

The building will be heated with hot water, and the lighting and ventilating will be carefully attended to, and will be a combined scheme. The woodwork throughout is of pitch pine, and the exterior is faced with patent bricks with stone dressings. The contractors for the work are:—W. Kearns, excavator; J. Merrick, bricklayer; A. W. Kenyon, joiner; R. Walsh, plumber; A. Warburton, plasterer and painter; Gregson &

Smith, masons; and J. Hodson, slater. Mr. W. J. Morley, F.R.I.B.A. (late Woodhouse & Morley), is the architect. The total cost of the building and site will be over 4,000*l.*

BUILDERS' LABOURERS.

IN connection with the decision of the Bedford bricklayers and labourers to strike, a labour meeting was held on the 26th ult. Rev. P. Wyatt, who spoke, said he was persuaded—and he did not know what the builders would say to this—that there were too many of them in Bedford and that they were under-cutting each other. Then a singular fashion, a moving fashion, had done a good deal of mischief. Those who had been in the town a good many years knew that certain land became the fashion, instantly there was a rush to it, the land was consequently at once put up to a fictitious value, the builders secured plots and built houses, and then the fashion went. This was the case with Ashburnham Road, the Embankment, Beckett Estate, De Parys Avenue. The builders could not possibly stand against this, as they had to give more than the property was worth, and then found the houses on their hands. They had all noticed that those engaged in the building trade had a tremendous fancy for most ornamental tiles and extraordinary terra-cotta things. This was an unconscious joke on the part of the architects, because these fancy tiles suggested that "monkey" which was one of the most fruitful sources of the mischief in the building trade at the present time. He did not mean to say that it was possible for anyone to go on without mortgaging their works. The rates of Bedford had to be mortgaged for municipal purposes, but mortgaging in general he looked upon as one of the most disastrous things in the trade. He thought the claim of the labourers was a just one. Although undoubtedly labourers were in possession of little luxuries which their grandfathers would not have dreamt about, still labour was not—and he would adhere to this if half England contradicted him—receiving its due share of that great increase of the national wealth and of those great privileges which had almost entirely been sucked in, not only by the great wealthy classes, but by the middle classes of England. But, honestly, he thought it was a very difficult time to endeavour to enforce their claim. The building trade was not now in the flourishing condition it had been in during the last five years. He was not one of those persons who went in for the parrot-cry that the

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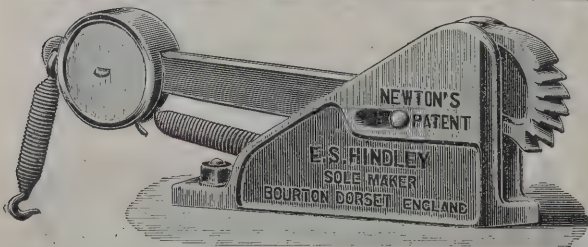
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town was over-built. It never had been, but from the present state of the town, and the fearful financial collapses we had had lately, it appeared that the trade must be checked very considerably for the next eighteen months. The gist of the whole question was, could they enforce their claim? Turning to another question, upon which he hoped he should not give offence to the builders, he asked if it was not a fact that many builders employed a great deal of labour from the villages. We all rejoiced in the fact that a man was able to live in the village and yet take part in the work of the town—and this chiefly through the aid of the cycle—but no builder had any moral right to pay village labour less than town labour. Let the workman from the village, who had his extra walk or ride, give his services for absolutely the same wages as the townsman. This was real co-operation of labour, real pulling together, and if it were done there would be no danger of importation of labour. But, just as their demands were, he did not think the present was quite the time to enforce them; and he would advise them in the meantime to earnestly set themselves to work to join some Union, so that when the happy time came when the demands for labour were strong and definite, there could be no mistaking them.

JERRY BUILDING.

THE *Standard* says:—The persons most directly to blame for the growth of jerry building are its victims. The London householder—and it is with the Londoner we are at present dealing, though the provincial is not blameless—is anxious to obtain a nice-looking house for less money than it can honestly be erected for. And the jerry builder appears—the *diabolus ex machina*—to supply the cheap and worthless article demanded. He is the public benefactor who rears these long suburban streets of houses all exactly the same, and displays such avidity, not to let them, but, for obvious reasons, to sell them. The architect has supplied a single plan, and, it is needless to say, can afford little time to superintend its endless multiplications, even if he was asked to do so. The speculative builder has generally little if any capital, and is trading entirely on advances—first from the freeholder of the land on which his creations appear, then from the brick and timber merchants, and, lastly, from the local bank, which claps a mortgage on the houses as soon as they are roofed in. To pay the interest on all these loans requires him to shave at every turn, and to sell,

or failing that, to lease his speculations very speedily if he is not to make an explanation of the financial mysteries of his craft before a commissioner in bankruptcy. And to let or sell his showy houses he must appraise them at "times prices," and even then comes out of the transaction with the least profit of all the parties who have indirectly had their hands in the householder's pocket. The truth is that a dwelling-house of the best kind is a very complicated piece of mechanism, the quality of which few people are capable of judging, and still fewer care or can afford to indulge in. But hosts of tenants are perfectly well aware that they are entering jerry-built mansions. They do not wish an ancestral home, it is argued, but a villa which will look well for three years, or, if of the higher order of the jerry style, for seven, fourteen, or twenty-one years. There are plenty of good houses in London, but they are either old-fashioned or too dear, and not pretentious enough for the money. It is immaterial to this class of customer whether the house is well or indifferently built. He believes it will last out his tenancy, though in this hope he is occasionally undeceived, and assuredly his successor will be. Moreover, the ordinary suburban resident is one of a migratory tribe. He seldom stays more than five or six years in the same locality, his period of decorous encampment being determined by the life of a cheap Brussels carpet. Then, metaphorically, he folds his tent like an Arab, and, as the local tradesmen occasionally bewail silently steals away. This habit the jerry builder has observed and ministers to.

AGRICULTURAL SHOW, GLOUCESTER.

MESSRS. MERRYWEATHER & SONS, who have undertaken, as in former years, the entire protection of the show buildings from fire for the Bath and West of England Society, had a handsome fire-station in the grounds. Capt. J. H. Cleaver, with a staff of trained firemen, had charge of the powerful fire-extinguishing apparatus. The plant available included a powerful double-cylinder "Greenwich" steam fire-engine, capable of throwing 360 gallons of water per minute and of raising steam in from six to eight minutes from time of lighting the fire. This engine is similar to those in use in the London, Liverpool, Manchester, Wigan, Hull, Bedford, Nottingham, Eastbourne, Wimbledon, Portsmouth, Bath, Salisbury, and many other brigades. The engine would be turned out by Messrs. Merryweather's staff day and night in case of a fire occurring in the show buildings, and some idea of its power

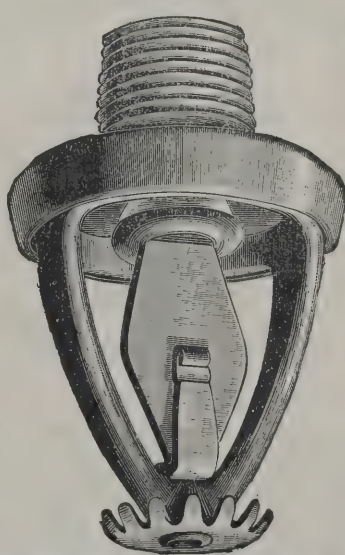
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may be gained from the fact that it will throw a solid jet, one and one-eighth inch diameter, to a height of 160 feet, or as many as six smaller jets if required. The next engine, the celebrated "Squires" engine, has proved itself useful on many estates during the recent drought for watering crops, fruit trees, &c. The "Squires" engine consists of a light portable driving engine, provided with a pump which can be thrown out of gear when required, and a fly-wheel on which a belt can be placed to drive electric lighting, threshing, grinding, churning, separating, deep-well pumping or other machinery. The pump will deliver 160 to 200 gallons of water per minute for fire extinguishing, water-supply or irrigation purposes, and the engine will develop from six to ten horse-power as required. A handsome "London Brigade" manual fire engine was fitted with Merryweather's new patent gun-metal valve box and breeching, as well as with other improvements which render it capable of delivering a much more powerful stream of water than the ordinary pattern. A "Universal" pattern manual suitable for irrigation or fire protection, a handy barrow-pump for similar purposes, hose-reels, "Tozer," "Corridor," "London Brigade" and other Merryweather hand fire-pumps were provided, as well as a full equipment of hose and gear for each. A number of these hand fire-pumps were placed in various parts of the buildings with buckets of water ready for immediate use in case of fire.

Messrs. Crossley Brothers, Limited, Openshaw, Manchester, had a much larger exhibition than usual, having six of their well-known "Otto" gas-engines running at 25 nominal horse-power with the new patent starter attachment, with which they can start the engines with half the load on, a 9 horse-power, a 3 horse-power, a 1 horse-power, a new type $\frac{1}{2}$ horse-power vertical engine which is exhibited for the first time, a new-type $\frac{1}{2}$ horse-power high-speed horizontal engine driving a dynamo, and one of their new patent 4 horse-power oil gas-engines driving a dynamo.

Tangye's, Limited, of Birmingham, had a magnificent show of gas-engines on the "Otto" principle, all in rapid motion, and the novel mechanism upon which they are constructed made the exhibit one of peculiar attractiveness. The high value which attaches to the machinery is emphasised by the fact that Tangye's, Limited, received a gold medal and other distinctions at the principal exhibitions. The Duke of Westminster and other distinguished personages are using these gas-engines, and have testified to the satisfactory manner in which they work.

PUBLIC WORKS IN HARROGATE.

At the meeting of the Association of Municipal and County Engineers held at Harrogate, Mr. S. Stead, the borough engineer, read a paper on "Municipal Work in Harrogate." He mentioned that the area of the borough was 1,287 acres, and the rateable value was about 92,000 £ . The general district rate was 3s. 2d., the borough rate 2d., and the poor rate 1s. 4d. in the pound. The management of the town was in the hands of the Improvement Commissioners from 1841 until 1884, when the borough was incorporated. The bulk of the sewage was delivered by gravitation on to an irrigation-farm of 310 acres situated just outside the borough boundary. When the farm was originally laid out the sewage was passed through a number of settling tanks, but this was not found to work well, and the sewage now passed in its crude state on to the land. The annual loss upon the working of the farm was about 150 £ , and 1,350 £ for sinking fund and interest, making a total of 1,500 £ . The ordinary dry-weather flow of sewage was about 320,000 gallons per day. The whole of the public streets within the borough were macadamised. It was estimated that the total length of the public roads and streets was about twenty miles, of which four miles were under the control of the West Riding County Council. Limestone from a quarry at Pateley Bridge was used for the tar macadam. The tar was purchased from the Harrogate Gas Company. The ashes for firing the rough or foundation material were got from the ordinary domestic ashpits. The limestone was broken to a 2 $\frac{1}{2}$ -in. gauge, and spread upon the ground in a heap about 6 feet wide, 15 to 18 inches high and any convenient length. A fire was then lit on the top, and the stones gradually turned over and mixed until all were at the same temperature. The stone was afterwards spread on an iron plate while warm and thoroughly mixed with gas-tar, after which it was stacked in a heap ready for use. The materials were much improved by stacking for a few months before being put on the roads. The streets were laid out at widths of 12, 15 and 20 yards, according to their importance. When villa residences were built detached or semi-detached, the drainage was usually into the front street. During the four and a half years he had been surveyor the average number of houses built per annum had been about 200. The gas supply was in the hands of a private company, from whom the Corporation purchased the gas used for the lighting

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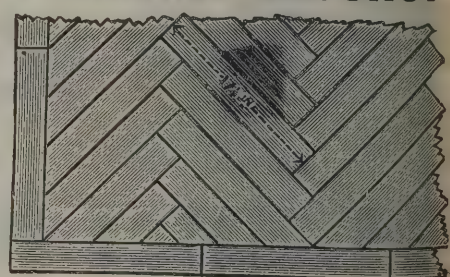
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Out of 17 $\frac{1}{2}$ " x 8" x 8" best yellow deals, planed all round, 12s. 4d. per 100; 17 $\frac{1}{2}$ " x 8" x 2" ditto, 8s. 11d. per 100; 17 $\frac{1}{2}$ " x 8" x 1" ditto, 6s. 10d. per 100. Delivered to van at our wharf. "Ex ship" within one month, 10s. 9d., 7s. 7d., and 6s. 0d. per 100 respect tively. Pitch Pine, 17 $\frac{1}{2}$ " x 8" x 8", 19s. 7d. per 100 pieces.



Dry Figured Wainscot Flooring with above special joint to conceal nails at following very low prices:—

1 $\frac{1}{2}$ x 4" Dry Wainscot Oak at 57s. 6d. per square.
1 $\frac{1}{2}$ x 4" ditto at 48s. 0d. "
1 $\frac{1}{2}$ x 4" Pitch Pine at 23s. 6d. "
1 $\frac{1}{2}$ x 4" ditto at 18s. 6d. "

IMPORTERS—

VIGERS BROS. Timber Merchants.

Head Office:—214 Pavilion Road, Chelsea, S.W.
Telephone 3,188.

of the street lamps, and paid for it at the rate of 2s. 8d. per 1,000 cubic feet. There were at present 564 public lamps in the borough. The Corporation had had the subject of electric lighting under consideration for some years past. In 1891 they obtained a provisional order empowering them to lay down the necessary plant to supply electricity within the limits of the borough. Since that time the Electric Lighting Committee of the Corporation had made careful inquiries, and had visited towns where installations had been laid down. They had also obtained advice on the subject from an expert. They were now advertising for tenders to do the necessary work for them. The water supply of the town was in the hands of a private company. The bathing establishments were the property of the Corporation. The Victoria Baths were erected in 1871 by the Board of Commissioners at a cost of about 30,000l. Additions and alterations had been made from time to time to these baths, in order to meet public demands. The Montpellier estate had been purchased from the representatives of the late Ald. George Dawson for 29,500l., and upon it were to be erected new baths, at a cost of between 40,000l. and 50,000l. The work would probably be commenced before the summer was over. At one time the lower portion of the town was liable in stormy weather to be flooded, owing to the lack of proper means for carrying off the storm water. To remedy this, parts of the old culverts had been enlarged. The open-ashpit system had been in vogue in Harrogate in the past, but the Corporation were now endeavouring as far as possible to replace these by movable galvanised iron dust-bins with covers. Formerly the removal of domestic refuse was left to individual householders, but last year the Corporation undertook this work, and the change had been attended with satisfactory results. Twelve underground tanks had been erected in which to store sulphur water, and these were capable of holding about 30,000 gallons.

Mr. Dixon, the waterworks engineer, read a paper on the "Harrogate Waterworks." All the attractions of Harrogate, he said, must have been deprived of much of their interest had it not been for the plentiful supply of water which the town enjoyed. The very wells for which it was now so famed rendered Harrogate some years ago all but destitute, the water from the wells and springs being so impregnated with extraneous ingredients as to make it quite unfit for domestic use. The town now received its water supply from the moorlands. The gravitation works were about five miles to the west of Harrogate. The company first obtained power to supply the

borough by an Act of Parliament in 1846. Owing to the scanty population of the district the first works erected were necessarily small. In 1861 the company had only 336 customers, while now they had 3,357. During the last ten years the population had increased rapidly, for while in 1881 only 109,000,000 gallons of water were used, the yearly consumption now averaged about 225,000,000. Mr. Dixon then went on to describe in detail the Ten Acres reservoir, the Harlow Hill service reservoir, the Beaver Dike reservoir, and the additional service reservoirs at Irongate Bridge. A constant supply was maintained in the town under pressure varying from 20 to 100 lb. to the square inch.

VENTILATION OF A BOARD SCHOOL.

THE system of heating and ventilation at the new Board School, Wheatley Street, Coventry, has been carried out by Messrs. Jackson & Son, heating and sanitary engineers, of Moor Street, Birmingham. The authorities have recently tested the system, and, judging by the report, are more than satisfied with the system.

On Friday, the 26th ult., Dr. M. A. Fenton, medical officer of health for Coventry, made an inspection of the ventilating apparatus of the Wheatley Street Board School, which has been supplied by Messrs. Jackson & Son, heating and ventilating engineers, Birmingham. There were also present during the inspection, in addition to the doctor, the Mayor of Coventry (Alderman G. Singer), the chairman of the School Board (Mr. J. Atkins), Mr. Caldicott, Mr. E. Brown (librarian at the free library), and Mr. Davies (clerk of works). Everything in connection with the system gave the fullest satisfaction. Dr. Fenton expresses the opinion that it is a most excellent one. Ventilation is a most difficult problem to deal with in respect to large schools, but at Wheatley Street it is believed the most efficacious system has been introduced. In the basement of the building is a very powerful fan, which sends 1,000,000 cubic feet of fresh air per hour into the building, there being also outlet shafts to take away the impure air. This quantity of fresh air, it will readily be admitted, should prove sufficient to keep the atmosphere of the rooms absolutely pure, and this is naturally the great desideratum. The following is a detailed description of the work at Coventry:—

The schools consist of ground and first floors, with large

ECCLIASTICAL EMBROIDERY,

VESTMENTS, ALTAR LINEN, FRONTALS,
BANNERS, TAPESTRY, CHURCH PLATE,
ART METAL WORK,
Carpets, Hassocks, Lamps, Cassettes, Surplices,
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ILLUSTRATIONS AND DESIGNS ON APPLICATION.
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COVENT GARDEN, LONDON.

TAYLOR & TUCKER ART METAL COMPANY, LIMITED, DESIGNERS AND MANUFACTURERS OF GAS AND ELECTRIC FITTINGS.

ART SMITHS.
SHOW-ROOMS:—
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ELECTRIC LIGHT ENGINEER.
ESTIMATES FREE.
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ARTISTIC METAL WORK
AND GAS AND
ELECTRIC

J. TAYLOR
(Late of TAYLOR & TUCKER),
FITTINGS
MANUFACTURER,
42 LAMB'S CONDUIT STREET, W.C.

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ARCHITECTS are invited to SPECIFY it
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ADVANTAGES.—The Framework is cast in one solid piece
The Armature can be taken out in a few seconds. There
are no loose wires hanging from the brush-holders.
The "Infant" Dynamo attains the high efficiency of
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MIDLAND WIRE CORDAGE CO., BIRMINGHAM.

Acknowledged by excellent Testimonials the
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AS SUPPLIED TO H.M. GOVERNMENT.

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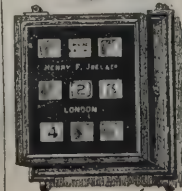
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SPEAKING TUBES.
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Estimates Free.

HENRY F. JOEL & CO.,
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FINSBURY SQUARE,
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Works and Offices—
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ONLY.

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S.W.

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EVER FIRM
Bevelled Wood Block
Flooring.

REGD. No. 60,906.

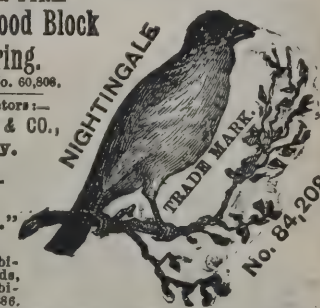
Sole Proprietors:—

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"Baltic
Redwood."

Prize Medal,
Liverpool Exhibi-
tion, 1886; Awards,
Sanitary Exhibi-
tions, 1885 and 1886.



ART DECORATING, GILDING,

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WORK done for the Trade.

Estimates, designs and specifications free.—Apply,
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2 Great Titchfield Street, Oxford Circus.

assembly hall upon first floor, and covered playground under assembly hall.

The heating is by a low-pressure hot-water apparatus, and power is derived from two large Trentham Cornish boilers fixed in basement, circulating pipes being carried from boilers through a series of air-flues under ground to recesses in the windows of the rooms upon each floor; in each window recess is fixed a large coil of hot-water pipes; large coils of hot-water pipes are also fixed in three recesses in assembly hall. Valves are fixed upon each coil to regulate the supply of heat.

The ventilation is effected by mechanical means. Fresh air is taken in at a large shaft several feet above the ground-floor level, and after passing through a screen to free it from dust, &c., is driven by a large fan along the various air-flues under the ground floor, and enters each classroom upon the ground and first floor under the windows. The air in cold weather is warmed by means of the low-pressure hot-water pipes fixed in the various air-flues, and the coils of pipes fixed in the recesses under the large windows in each classroom, and also in the three recesses in the assembly hall. In the summer time the rooms are ventilated by the same means, except that the air is allowed to enter unwarmed. The air is thus forced into each of the classrooms, corridors, &c., is driven out by the same force up extract shafts from openings near the floor level in each room on the opposite side to that at which it enters, and then into the main exhaust air-trunks in the roof, which are connected with the tower, and so passes away. For summer ventilation openings are provided in each room near the ceiling. The fan is driven by a powerful gas-engine, and is so regulated as to change the air in the whole of the building three times per hour, this being equal to passing 930,000 cubic feet of fresh air through the schools each hour the apparatus is working. A temperature of 60 to 65 deg. is maintained in each of the rooms during the winter months with the constant change of air as before-named.

REGISTRATION OF PLUMBERS.

THE annual conference of the district councils for South Wales, in connection with the national registration of plumbers, was held at Swansea on Saturday. Dr. Morgan, public analyst, presided, and there was a good attendance of representatives of the public and the plumbing trade of the district. Mr. Glendinning Moxham, architect, of Swansea, read a paper on "Sanitation and the Sanitary Education of Plumbers," and

after full discussion the following resolution was passed:—"That it is desirable in the opinion of this conference that all sanitary and plumbing work should be carried out under the direct supervision of some person or persons who shall be held directly responsible for the faithful completion of the work, and that this conference submits that registered plumbers are better qualified for that position than any other members of the building trades."

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

10165. John Nicol Mitchell and William Morrison, for "Improvements in and relating to open or close fire-stoves, grates or cooking-ranges."

10173. John Alexander Steven, for "Improvements in and relating to hydraulic lifts."

10292. Chester M. Bates and Horace C. Lutz, for "A combined elevator and carrier."

10312. William Stewart Halley and John Best, for "Improvements relating to gas-stoves, ranges, and the like."

10315. Joseph Wilson, for "An improved chimney-top."

10344. Henry Harris Lake, for "An improved combined pneumatic door-check and atomizer."

10345. Cesar Müller, John Franz Frederick Brinckmann and Hermann Luban, for "Improved means and arrangements for protecting the hollow iron parts of buildings against the action of fire."

10390. Louis Joseph Tiraud, for "Improvements in fire-alarms."

10426. Edward Collier and Richard Collier, for "Improved means for securing door-knobs to their spindles."

10470. Joseph Armytage Wade and John Cherry, for "An improved centrifugal machine adapted for use as a pump, blower, or exhauster."

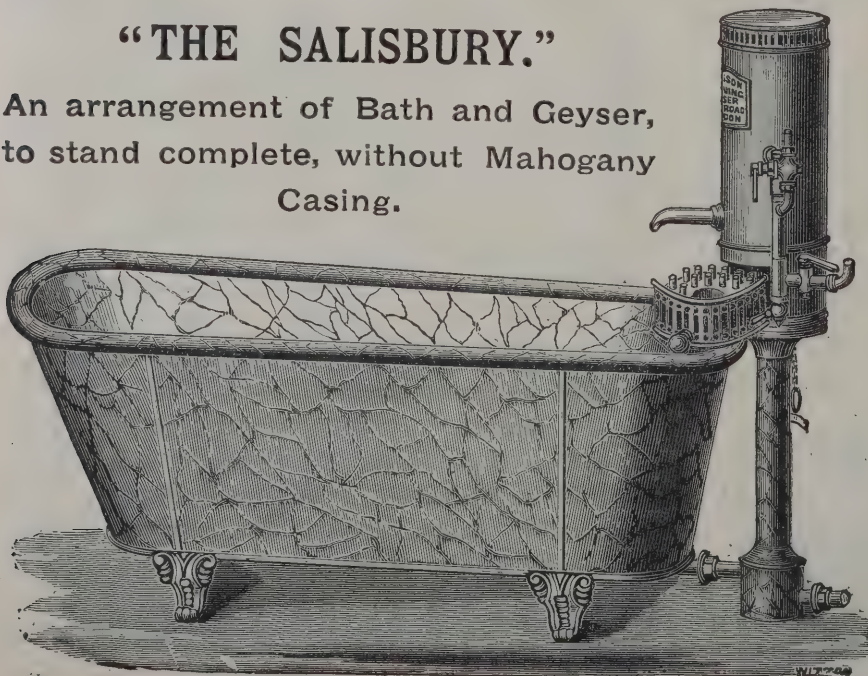
TO INVENTORS. — Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

WITHOUT KITCHEN FIRE, HOT WATER INSTANTLY, NIGHT OR DAY.

Boiling Water in a Minute. Warm Bath when Wanted.

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An arrangement of Bath and Geyser,
to stand complete, without Mahogany
Casing.



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AND AT

CHICAGO EXHIBITION
(Machinery Section).

THE

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The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

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Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

THE ARCHITECT AND CONTRACT REPORTER.

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For Two Lines and under (eight words to the line)	£0	2	6
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On pages preceding and following matter, special rates.

Public Companies' Advertisements, 12l. 12s. per page; 1s. per line.

Special arrangement may be made for a series of insertions on application to the Publisher, P. A. GILBERT WOOD, 175 Strand, London, W.C.

COMPETITIONS OPEN.

DARLINGTON.—Designs are invited for Municipal Offices. Borough Surveyor, Town Hall, Darlington.

MONMOUTH.—Aug. 1.—Premiums of 30 and 20 guineas are offered for schemes for Disposal of Sewage. Mr. T. R. Oakley, Town Clerk, Monmouth.

ROCHESTER.—June 26.—Designs are invited for the Sewerage of the Village of Borstal. Premiums of 25 Guineas and 10 Guineas. City Surveyor, Guildhall, Rochester.

ST. HELENS.—July 24.—Designs are invited for Public Library and Technical School. Premiums of 100l., 50l. and 25l. W. J. Jeeves, Town Hall, St. Helens.

SWANSEA.—Designs are invited for School Building. Premiums of 50 guineas and 10 guineas. Mr. A. W. Halden, School Board Offices, Dynevor Place, Swansea.

TOTTENHAM.—Aug. 1.—Designs are invited for Town Hall and Board Offices. Premiums of 75l., 50l. and 25l. Mr. J. E. Worth, 712 High Road, Tottenham, N.

WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50l. and 25l. Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10l. Mr. Horatio Brevitt, Town Hall, Wolverhampton.

CONTRACTS OPEN.

ABERTILLERY.—June 26.—For Building Goods Shed and Offices. Mr. G. K. Mills, Secretary, Paddington Station.

ABINGDON.—July 8.—For Supplying and Fixing Two Cornish Boilers, Steam Radiators, Cooking Apparatus, &c. Mr. G. Winship, Borough Buildings, Abingdon.

ACCRINGTON.—June 26.—For Building Technical School. Mr. Henry Ross, Architect, Birch Street, Accrington.

ALTON.—For Building Studio and Workshops. Mr. W. T. Crampton, Warehouse J, Baldwin's Gardens, Gray's Inn Road, W.C.

ANDOVER.—For Repairing Burlington Bridge. Mr. G. H. Stagg, East Street, Andover.

ANDOVER.—June 20.—For Building Iron Hospital. Mr. A. Purkess, Town Hall, Andover.

ASHFORD.—June 30.—For Painting at District School. Mr. C. D. Hume, District School, Ashford, Middlesex.

AYLESBURY.—July 4.—For Building Brick and Iron Bridge over Canal. Mr. R. J. Thomas, Exchange Buildings, Aylesbury.

BOROUGHBRIDGE.—For Building Malthouse. Mr. J. Sykes, Architect, Princess Street, Morley.

BOVEY TRACEY.—June 23.—For Building Farmhouse. Mr. S. Segar, Architect, Union Street, Newton Abbot.

BRIDGEND.—June 30.—For Construction of Retort-house, Retort-arches, Chimney-stack, Coal-store, &c. Mr. J. H. Dyer, Secretary, Gas and Water Company, Bridgend.

CAERGWYRLE.—For Building Chapel. Mr. T. G. Williams, 3 Cable Street, Liverpool.

CAMBRIDGE.—June 24.—For Adding Wing to Asylum. Mr. T. Musgrave Francis, Clerk to the Visitors, Cambridge.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CHORLEY.—For Rebuilding King's Arms Hotel. Messrs. Heaton & Ralph, Architects, King Street, Wigan.

CLAY CROSS.—June 28.—For Constructing Reservoir. Mr. W. H. Radford, Angel Row, Nottingham.

COCKERMOUTH.—June 22.—For Altering and Repairing Farm Buildings. Mr. Robinson Mitchell, Cockermouth.

COLCHESTER.—June 19.—For Building Pavilion Shed at Castle Park. Mr. H. Goodyear, Borough Engineer, Colchester.

COLCHESTER.—June 24.—For Construction of Engine and Boiler Houses, Chimney Shaft, &c., Additions to Waterworks Superintendent's House, &c. Mr. C. E. Bland, 12 Crouch Street, Colchester.

CRAWLEY.—June 24.—For Alterations and Additions to Crawley Lodge. Mr. W. Buck, 65 West Street, Horsham.

DONCASTER.—June 26.—For Restoring Premises after Fire. Messrs. Burtenshaw & Tovey, Solicitors, Doncaster.

DOUGLAS.—June 22.—For Constructing Iron Promenade Pier. Mr. T. H. Nesbitt, Town Clerk, Douglas.

EASTBOURNE.—June 19.—For Making Roads and Laying Drains. Mr. B. Pomfret, 30 High Street, Tunbridge Wells.

EAST MOLESEY.—June 21.—For Constructing Sewers, Building Engine and Boiler-houses, Precipitation Tanks, &c. Mr. J. C. Melliss, 232 Gresham House, Old Broad Street, E.C.

EDMONTON.—June 19.—For Paving Main Road. Mr. G. E. Eachus, Town Hall, Lower Edmonton.

EDMONTON.—June 20.—For Supplying and Fixing Steam Pipes, Coils and Coil Cases. Mr. J. E. Knightly, Architect, 106 Cannon Street, E.C.

FALMOUTH.—June 24.—For Building Hospital. Mr. R. N. Rogers, 7 Arwenack Street, Falmouth.

VERITY BROS. CALL LANE, LEEDS.

Manufacturers of their High-Class

ROLLING BOLT, MORTICE & RIM LOCKS, NIGHT LATCHES, &c.

In our Deadweight Lock as per drawing herewith, we have so applied the different Movements that the pressure is equal in both ways of turning the knob, and we guarantee their giving entire satisfaction

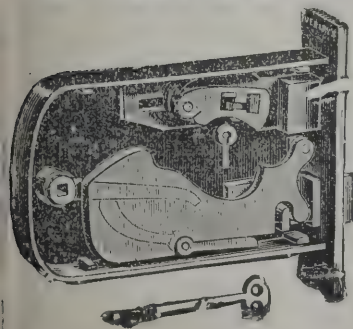
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The largest Varieties of Openers suitable for Skylights, Fanlights, &c., which can be fixed in any position.

Casements in Wrought Iron, Steel, and Gun Metal.

Espagnolette Bolts, Weather Bars, Sash Fasteners, Door Checks.

CATALOGUES FREE BY POST.



GLASGOW.—July 1.—For Supplying Cast-iron Pipes, Hydraulic Valves and Fittings, Bolts, Nuts, &c. Messrs. Ellington & Woodall, Palace Chambers, Bridge Street, Westminster.

GREAT WESTERN RAILWAY.—June 27.—For Building Passenger Stations, Goods Sheds, Retaining Wall, Widening and Constructing Bridges, &c. Mr. S. K. Mills, Paddington Station, W.

GREENWICH.—June 20.—For Supplying Granite Cubes, Paving Bricks, Lime, Cement, &c. Mr. J. Spencer, 141 Greenwich Road, S.E.

HINDLEY.—For Constructing Iron Fence and Boundary Wall. Messrs. Heaton & Ralph, Architects, King Street, Wigan.

HUDDERSFIELD.—June 22.—For Taking Down and Rebuilding Premises, Victoria Lane. Messrs. John Kirk & Sons, Architects, Huddersfield.

IPSWICH.—June 27.—For Constructing Iron Fences. Mr. A. Sandbach, Cornhill Chambers, Thoroughfare, Ipswich.

ISLINGTON.—June 26.—For Repairing and Painting and Providing Flushing Apparatus at Public Urinals. Mr. J. P. Barber, Vestry Hall, Upper Street, N.

JARROW.—July 4.—For Repairing Boundary Walls, &c. Mr. J. H. Morton, Architect, King Street, South Shields.

JERSEY.—June 30.—For Widening North Pier of Harbour. Mr. E. Berteau, Royal Square, Jersey.

LAKE VYRNWY.—June 20.—For Building Offices, Workshops, Two Cottages, &c. Mr. G. J. Atkinson, Municipal Buildings, Liverpool.

LEICESTER.—June 24.—For Two Triple Expansion Pumping Engines. Mr. J. B. Everard, Engineer, 6 Millstone Lane, Leicester.

LONDON.—June 21.—For Building Chimney Shaft, Residence, Stables, &c. Mr. G. W. Preston, St. Luke's Vestry Hall, City Road, E.C.

LUTON.—For Building Residence, Laundry, &c. Mr. W. J. Pearson, Architect, Market Hill, Luton.

MANCHESTER.—June 21.—For Building Offices. Mr. C. W. Bailey, Lancashire and Yorkshire Railway Company, Hunt's Bank, Manchester.

MANCHESTER.—July 1.—For Constructing Gasholder. Mr. C. Nickson, Town Hall, Manchester.

MELTHAM.—June 28.—For Laying Fireproof Floors. Messrs. J. Kirk & Sons, Architects, Huddersfield.

MOULSFORD.—June 16.—For Building Isolation Hospital. Mr. E. T. Hine, Architect, 35 Parliament Street, Westminster.

NEATH.—June 22.—For Building Intermediate and Technical School. Mr. D. M. Jenkins, Architect, Gwyn Hall, Neath.

PENISTONE.—June 22.—For Building Engine-house. Mr. W. H. Radford, Angel Row, Nottingham.

RAMSEY.—July 6.—For Building Schools, Boundary Walls, &c. Mr. J. W. Start, Architect, Cups Chambers, High Street, Colchester.

ROCHESTER.—June 29.—For Building Retort House for Rochester Gaslight Co. Mr. W. Syms, 58 High Street Rochester.

ROUNDHAY.—June 23.—For Building Entrance Lodge. Messrs. Swale & Mitchell, 98 Albion Street, Leeds.

RUDGWICK.—June 23.—For Building Girder Bridge over River Arun. Mr. W. Dengate, 58 Park Street Horsham.

SALFORD.—June 22.—For Building Refuse Destructor. Borough Engineer, Town Hall, Salford.

ST. MARYLEBONE.—June 19.—For Painting and Sanitary Works at Workhouse. Mr. A. S. Snell, Architect, 22 Southampton Buildings, W.C.

SHIPLEY.—June 26.—For Additions and Alterations to Slaughter-houses. Mr. J. S. Rhodes, Manor House, Shipley.

SPURN POINT.—June 29.—For Building Lighthouse, &c. Mr. E. Clark, 47 Strand, W.C.

STEPNEY.—June 22.—For Additions to Union Workhouse. Mr. S. E. Holman, Architect, Union Workhouse, St. Leonard's Street, Bromley-by-Bow, E.

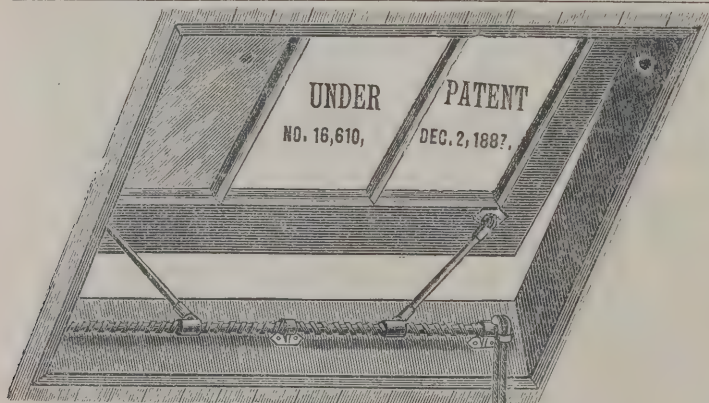
STONE.—June 21.—For Building Laundry, Mortuary, Disinfecting Chamber, &c. Mr. John J. Chapman, Architect, Stone.

STONE STANTON.—June 24.—For Supplying and Laying Cast-iron Socket Mains, Sluice and Air Valves, Wall Fountains, "Torrent" Filter, &c. Mr. S. Preston, Church Street, Hinckley.

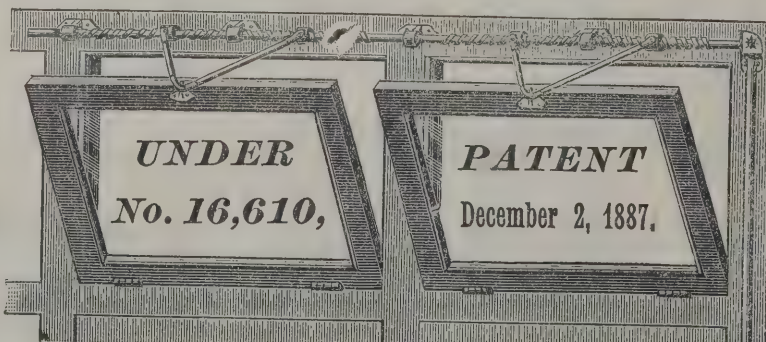
WESTMILL.—July 3.—For Rebuilding Bridge. Mr. Urban A. Smith, 28 Victoria Street, Westminster, S.W.

TREDEGAR.—June 26.—For Additions and Alterations to Schools. Mr. C. Dauncey, School Board Offices, Tredegar.

WANSTEAD.—June 30.—For Repairing Schools. Mr. J. T. Brassey, 70 Bishopsgate Street Within, E.C.



ROBT. ADAMS'S Patent Ventilating Apparatus for Continuous Sashes of Lantern Lights, Conservatories, &c. Number of Patent, 16,610, dated December 2, 1887.



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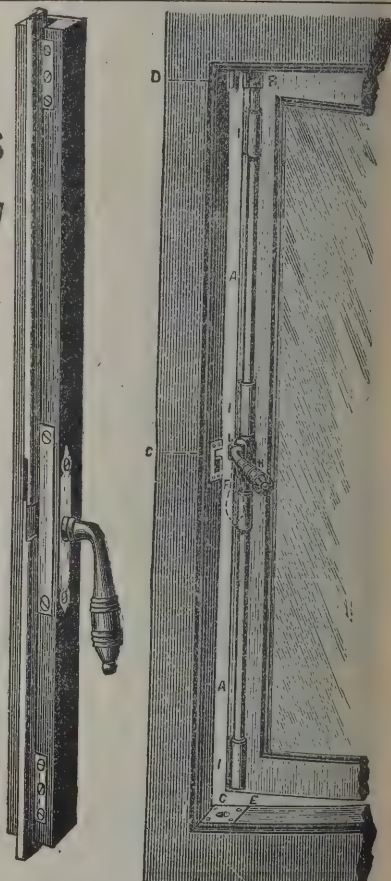
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No. 68.—Special thrust-motion round section Bolt suitable for very narrow tiles. It can be fixed where the space is insufficient for anything else. This Bolt is neat, strong and reliable.

WESTMINSTER.—June 21.—For Constructing Underground Convenience, Laying Wood Paving and Asphalt, and Building Stabling and Depôt. Mr. G. R. W. Wheeler, Town Hall, Westminster.

WIGAN.—For Building Twenty Cottages. Messrs. Heaton & Ralph, Architects, King Street, Wigan.

WIGAN.—For Building Six Dwelling-houses. Messrs. Johnson & Sons, 31 King Street, Wigan.

WORCESTER.—June 24.—For Building Electric Lighting Station. Mr. S. G. Purchas, Guildhall, Worcester.

WOOLWICH.—June 19.—For Painting Barracks. Lieut.-Col. W. H. Rathbone, Royal Engineer Office, Woolwich.

TENDERS.

ABERDARE.

For Building Vicarage at Hirwain, Aberdare, for Rev. W. Rhydderch. Mr. D. JENKINS, Architect, Llandilo.

D. Jones £2,000 0 0
C. Jenkins & Sons 1,775 0 0

ANERLEY.

For Erection of New Receiving Wards at the North Surrey District Schools, Anerley, and Sundry Alterations, &c., to Present Buildings. Mr. A. G. HENNEL, Architect, Forest Hill. Quantities by Mr. J. R. VINING, 89 Chancery Lane, W.C.

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F. & H. F. Higgs	£5,794 0 0	£994 0 0
Higgs & Hill	5,720 0 0	990 0 0
Holloway Bros.	5,410 0 0	881 0 0
W. Johnson & Co.	5,300 0 0	860 0 0
Black & Son	5,180 0 0	794 0 0
Turtle & Appleton	4,956 0 0	848 0 0
W. Wallis	4,897 0 0	785 0 0

BATH.

For Building the Orange Grove Avenue of Market, for the Corporation. Major DAVIS, F.S.A., Architect, Bath. Quantities by Mr. AMOR, Bath.

C. Wibley £1,485 0 0
J. Long & Sons. 1,272 0 0
Hayward & Worster. 1,216 0 0
E. Chancellor 1,182 0 0
T. MORRIS & SON, Bath (accepted). 1,095 0 0

BARDNEY.

For Constructing Bridge of 105 feet Span over the River Witham at Bardney, Lincolnshire, in Two Contracts, viz. one for the Brickwork and Approaches, and the other for Steel Lattice Girders and Flooring. Mr. J. THROPP, County Surveyor, 29 Broadgate, Lincoln.

Brickwork and Approaches.

J. Bradley, Lincoln	£4,459 18 5
Holme & King, Wymondham	4,159 11 9
S. & J. Bentley, Leicester	4,130 0 0
F. Pattinson, Ruskington	4,014 4 0
W. Bardell, King's Lynn	3,872 5 6
H. Solden, Wisbech	3,826 16 2
S. & R. Horton, Lincoln	3,712 8 6
E. Howson, Lincoln	3,686 6 0
Brown, Phillips & Co., Wigan	3,451 3 0
Somervail & Co., Dalmeir	3,442 11 0
S. SHERWIN, Boston (accepted)	3,437 0 0

Steel Lattice Girders and Flooring.

J. O. Brettell, Worcester	2,864 11 7
Cleveland Engineering Co.	2,758 0 0
Holme & King	2,715 3 1
Somervail & Co.	2,659 15 8
Butterley Co., Limited, Alfreton	2,649 3 8
Phoenix Foundry Co., Derby	2,644 3 2
Handyside Co., Limited, Derby	2,553 9 5
J. Butler & Co., Stanningley	2,485 0 0
Stockton Forge, Stockton-on-Tees	2,448 3 11
M. Pitts, Stanningley (accepted)	2,392 2 3

Entire Works.

A. Thorne, Westminster	7,945 0 0
M. Pitts	7,076 10 5
Kirk, Knight & Co., Sleaford	7,062 0 0
Holme & King	6,874 14 10
F. Pattinson	6,572 10 7
Handyside Co., Limited	6,092 5 5
S. Sherwin	6,039 0 0
Somervail & Co.	6,102 6 8

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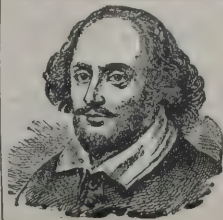
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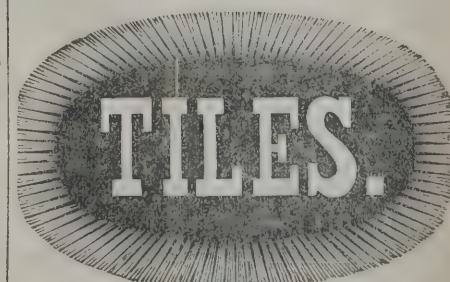
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T. Smith, Birmingham	£4,230	0	0
W. Lee & Son, Birmingham	4,000	0	0
J. Moffat & Son, Birmingham	3,995	0	0
S. Sorman & Sons, Birmingham	3,949	0	0
S. Taylor, Birmingham	3,755	0	0
J. Harley & Son, Smethwick	3,733	0	0
T. Lond, Selly Oak	3,725	0	0
B. Whitehouse, Birmingham	3,723	0	0
HENRY ALLEN, Birmingham (accepted)	3,478	0	0

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J. & J. Horsfield, Dewsbury	£2,998	0	0
<i>Engines, Dynamos, Accumulators, &c.</i>			
Crompton & Co., London	6,257	0	0
<i>Mains.</i>			
Siemens Bros. & Co.	3,856	0	0

DUNDEE.

For Providing and Laying By-pass Pipe under the Bed of the River Isla, at Crathie, near Meigle, for the Water Commissioners. Mr. GEORGE BAXTER, Engineer, 7 Euclid Street, Dundee.

G. Mackay & Son, Crieff	£2,737	1	3
J. Young & Co., Edinburgh	2,195	4	6
J. Leith, Aberdeen	2,015	11	8

HALIFAX.

For Pulling-down Old Fire Brigade Station, Albion Street, and Building Shops in the Market Hall, for the Market and Fairs Committee of the Halifax Corporation. Mr. E. R. S. ESCOTT, Borough Engineer.

H. Jenkinson, Halifax	£1,473	0	0
Siddals, Halifax	1,397	0	0
B. & J. Riley, Halifax	1,384	0	0
Wharmouth, King Cross	1,376	0	0
Gaines & Son, Halifax	1,368	0	0
EARNSHAW, Halifax (accepted)	1,340	0	0

HANLEY.

For Building Eight Houses, Commercial Road, Hanley. Mr. E. JONES, Architect, 10 Albion Road, Hanley.

J. T. Clarke	£1,996	15	0
C. Cornes	1,825	0	0
A. Ward	1,735	0	0
Challenor & Hughes	1,649	0	0
A. Hall	1,600	0	0
J. Gallon	1,526	0	0
L. Leek	1,100	0	0

KIRKBY WOODHOUSE.

For Alterations and Additions to the Kirkby Woodhouse Schools, for the Kirkby-in-Ashfield School Board. Mr. LAWRENCE BRIGHT, Architect, 9 St. Peter's Church Walk, Nottingham.

Gilbert & Gabbittas, Nottingham	£3,203	0	0
F. R. Sharley, East Kirkby	2,884	0	0
T. Barlow, Nottingham	2,881	0	0
J. OSCROFT, Nottingham (accepted)	2,810	0	0
L. Green, Hucknall Torkard	2,704	0	0

LEYTON.

For Construction of New Latrines at the Church Road Schools, for the Leyton School Board.

Catley	£320	0	0
Scott	317	0	0
Wood	300	0	0
Coxhead	248	18	0
HOLLAND (accepted)	239	0	0
Architect's estimate	187	0	0

For Tar Paving, Leyton School Board.

<i>Lea Bridge.</i>			
Rutty	£249	0	0
Lawford & Co.	184	5	0
Jackson	167	13	0
Constable & Co.	150	0	0
HOBMAN & Co. (accepted)	145	0	0
Architect's estimate	170	0	0

Ruckholt.

Rutty	699	0	0
Lawford & Co.	659	0	0
Jackson	533	7	0
Constable & Co.	495	0	0
HOBMAN & Co. (accepted)	467	0	0
Architect's estimate	560	0	0

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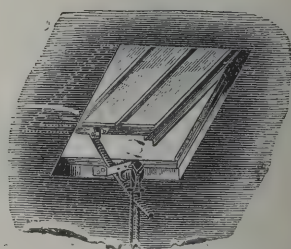
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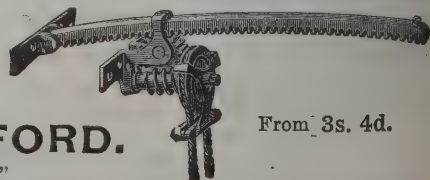
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J. Grundy	£470 8 0	0	0
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D. Charteris	360	0	0	15
Humphreys, Limited	356	13	4	15
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NEWHAVEN.

For Building House at Newhaven, for Dr. Mossopp. Mr. A. A. OAKDEN, Architect, Eastbourne.

Redman	£1,100	0	0
Longley	1,030	0	0
Chapman	998	0	0
Huggett	977	15	0
Errey	910	0	0
WOOLGAR (accepted)	840	0	0

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R. F. Yeo, Torquay	1,975	0	0
Farr Bros., Kingsbridge	1,910	0	0
E. Westlake, Paignton	1,895	0	0
Webber & Sons, Paignton	1,886	0	0
Rabbich & Brown, Paignton	1,831	0	0
C. & R. E. Drew, Paignton *	1,694	0	0
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R. M. Beattie, Portadown	590	10	0
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R. LUTON, Portadown (accepted)	540	0	0

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S. Wright, Queensbury, plumber and glazier	147	10	0
J. Bairstow & Son, Queensbury, joiner	134	10	0
T. Greenwood, Queensbury, slater and plasterer	52	0	0
S. Hodgson, Queensbury, painter	22	18	0

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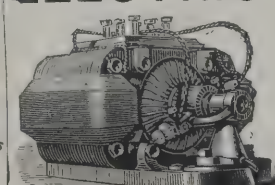
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Malvern & Son, Cheltenham	£960	0	0
Barrett, Swindon	885	0	0
J. Williams, Swindon	870	0	0
Wiltshire, Swindon	800	0	0
Cowley, Wroughton	770	0	0
W. CHAMBERS, Swindon (accepted)	696	0	0

For Building Two Cottages, Wroughton, Swindon, for Mr. F. W. Pavy. Mr. W. H. READ, Architect, Corn Exchange, Swindon.

J. Williams, Swindon	£450	0	0
Wiltshire, Swindon	440	0	0
COWLEY, Wroughton (accepted)	394	10	0
Beale, Swindon	300	0	0

For Building Stable, &c., at Wroughton, Swindon, for Mr. F. W. Pavy. Mr. W. H. READ, Architect, Corn Exchange, Swindon.

J. Williams, Swindon	£220	0	0
Wiltshire, Swindon	200	0	0
Beale, Swindon	200	0	0
Cowley, Wroughton	186	14	0

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Dennis & Co., Ruabon	£8,130	0	0
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Terra-cotta.

VARIETIES.

THE eleventh annual exhibition (Cassell's Black and White Exhibition) has been opened at the Cutlers' Hall, Warwick Lane, Newgate, and will remain open till the 29th inst.

A REPORT on the Leamington borough water supply has been drawn up by Mr. H. Howell for the Town Council. Mr. Howell expresses the opinion that there should be no fear that the present supply will prove insufficient in ordinary seasons; but, in view of the possibility of a succession of dry seasons, and the tendency shown by consumers to waste water when it is not supplied by meter, he recommends an extension of the

system of driving underground adits so as to increase the supply, and that a new well be sunk between Lillington and Cubbington.

THE docks at Runcorn, which have been closed twelve months, have been reopened for traffic, the portion of the Manchester Ship Canal between Weston Point and the Bridgewater tidal dock having been completed. The water was admitted into the new waterway two or three weeks ago, but since then the deepening of the Bridgewater lock has been going on, and this having been finished now, it is found possible to recommence dealing with the traffic on the same lines as before.

At the meeting of the Motherwell Commissioners, Provost Colville presiding, it was agreed to borrow 7,000*l.* for the drainage, causewaying and hospital works of the burgh.

MR. BALDWIN LATHAM, who was engaged as an expert engineer to report to the Shipley Local Board as to the disposal of the sewage of their district, has sent in his report, and estimates his scheme to cost 32,000*l.*, and the working expenses at 1,531*l.* a year. This alone would entail a charge of 6*d.* in the pound on the rates, and the interest and sinking fund would mean another 6*d.* in the pound.

THE Chapel-en-le-Frith Rural Sanitary Authority have instructed Mr. W. H. Radford, C.E., of Nottingham, to prepare a scheme for the sewerage and sewage disposal of Castleton in their district.

THE Sewerage Committee of the Wolverhampton Town Council recommend that their newly-acquired land be under-drained, and that other work be executed at the Barnhurst Farm at a cost of 10,200*l.*, and a loan obtained for that amount. The Public Works Committee recommend that certain streets be paved with granite setts, at a cost of 8,951*l.*, and that the Finance Committee be authorised to obtain a loan of 9,000*l.*

A TRURO paper says:—Rumours are being circulated to the effect that the Poltisco Serpentine Works at Ruan, near Helston, which until lately have been carried on by Mr. Jabez Druitt, and which were offered for sale a few days ago, have been inspected by a prominent architect, a builder, and an iron-founder of the county, with a view to being worked as a limited liability company.

IN a letter to the *Times* Mr. R. B. Marston says:—The roadway of Waterloo Bridge is made of stones which are so smooth and slippery that even when perfectly dry or slightly

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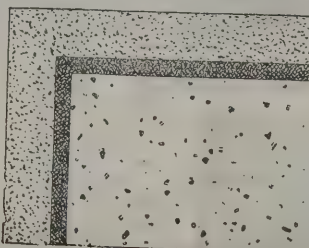
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wet horses are always falling. Not only carelessly-driven hansom horses going fast, but heavy waggon horses will suddenly fall even when going at a walking pace. It is manifestly impossible for a smooth iron horseshoe to get a sure hold on smooth polished granite.

THE plans submitted by the Central London Railway Companies in regard to the proposed Central Station at the Mansion House have been approved by the City Commissioners of Sewers. The plans show seven staircases, connecting with the subways and the railway station. The principal access to the subways will be by two staircases on the western front of the Royal Exchange—one at Threadneedle Street and the other at Cornhill—and a third at the junction of Queen Victoria Street and the Poultry. There will be two staircases at the corner of Princes Street, one in Mansion House Place and one in Walbrook. The staircase abutting against the Bank has been abandoned. Considerable areas would be taken out of the public ways for the staircases. These, however, would provide subways for pedestrians and openings to the railway station.

ELECTRICAL.

At the meeting of the Coatbridge Dean of Guild Court linings were granted to the Scottish House-to-House Electricity Company, Limited, to erect works for the supply of electricity in the burgh at Henderson Street.

A JOINT committee of the two Houses of Parliament, presided over by Viscount Cross, sat on Monday, the 12th inst., to consider whether the grant of statutory powers to use electricity ought to be qualified by any prohibition or restriction as to earth return circuits, or by any provision as to leakage, induction or similar matter, and, if so, under what conditions. Sir Theodore Martin asked that the parties interested might be heard before the committee through counsel. After consultation in private, the committee decided to hear counsel on behalf of the following bodies:—(1) The railway companies; (2) the National Telephone Company; (3) the tramways and electric railway companies; (4) the electric lighting companies; (5) the English and Scotch municipalities and the London County Council. The committee arranged to meet on the following Monday, and in the first instance to take the evidence of Sir Courtenay Boyle on behalf of the Board of Trade.

At the meeting of the Watch Committee of the Worcester City Council the Electric Lighting Sub-Committee recommended the employment of Mr. W. H. Preece as engineer, to supervise the execution of the electric-lighting works, at a commission of 2½ per cent. on the amount of the Brush Company's contract—20,000l. This was adopted.

THE arrangements for lighting Rugby School with electricity have been completed, and the work of laying down the generating plant is being proceeded with. The boarding-houses, sanatorium, art museum, gymnasium and the whole of the school will be lighted, and about 15,000 incandescent lamps will be used. It is estimated that the cost will be at the rate of 4d. or 4½d. per Board of Trade unit, which is equivalent to gas at 3s. 6d. per 1,000 cubic feet.

THE report of the Lighting Committee of the Wolverhampton Town Council states that Mr. F. H. Harman, of Hull, has been appointed electrical engineer to the Corporation at a salary of 300l. per annum; and Mr. A. P. Brevitt, of Wolverhampton, has been appointed architect to prepare plans and specifications of the necessary buildings in connection with the scheme.

BUILDING AND BUILDERS.

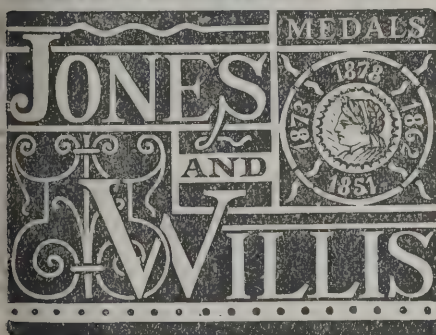
PLANS have been prepared by the county surveyor for a new police station to be erected at Cradley, at a cost of 3,000l., for the Worcestershire County Council.

At the meeting of the Burslem Town Council the Baths Committee recommended that the building of the baths should be proceeded with at once on the site in Moorland Road, that the amended tender of Mr. William Cooke for the erection of the baths for the sum of 7,958l. be accepted and application made to the Local Government Board for sanction to borrow 9,000l. for the purpose.

THE *Blackpool Times* says:—Mr. Herbert Wade, architect, of St. Annes, has just got out plans for Mr. Riley for the first houses at Fairhaven. The marine drive, along the Stanner, has now been formed beyond the bridge in the direction of St. Annes. About 100 workmen are engaged, beside a couple of steam diggers. Mr. Giffen succeeded the late Mr. James Riley in the superintendence of the work as engineer. Mr. Carter fulfils the post of surveyor.

It is proposed to erect and furnish a hospital at a cost of 3,000l. at Orsett, to jointly serve that borough and Horbury.

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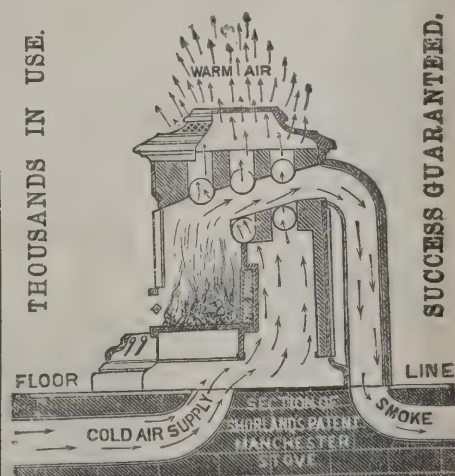
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ON the recommendation of the Technical Instruction Committee the Widnes Town Council have decided that, subject to the sanction of the Local Government Board being obtained to the borrowing of the money, the following tenders be accepted:—For the erection of technical school and free library combined, Mr. Isaac Dilworth, Wavertree, 8,130*l.*; and for supply of Dennis Ruabon terra-cotta, Messrs. Dennis & Co., Ruabon, per Mr. John R. Lea, 875*l.*

THE Leyton Local Board have decided to erect parochial offices on land adjoining the present building.

TRADE NOTES.

NEW hospitals, East Poorhouse, are being erected at Dundee for the Dundee Parochial Board, from the plans of Mr. W. Alexander, architect. The whole of the wards are being warmed by Mr. E. H. Shorland, of Manchester, by means of his patent open fireplace Manchester stoves with ornamental tiled sides and backs and with descending smoke flues.

THE Yost typewriter has gained another gold medal in Paris, the occasion this time being the exhibition under the auspices of the Académie du Progrès Nationale. This makes the fifth gold medal and the sixth highest award granted to the Yost typewriter, which has carried off the highest honours wherever it has been exhibited.

THE Gas and Water Committee of the Widnes Town Council recommend that the tender of Messrs. R. & J. Dempster, of Manchester, for the supply and erection of a Gadd & Mason patent spiral gasholder for 4,940*l.*, be accepted. The profit on the gas undertaking for the year ended March 1893 amounted to 2,545*l.* 1*s.* 7*d.*, and on the water account 447*l.* 11*s.* 11*d.*

THE Tees Port Sanitary Authority, at their monthly meeting at Middlesbrough, accepted the tender of Messrs. Head, Wrightson & Co. for the construction of the Tees Floating Hospital for 6,000*l.*

MESSRS. WERNER, PFLEIDERER & PERKINS, Limited, write to us:—We have pleasure in informing you that in consequence of an arrangement which has been come to between the firm of A. M. Perkins & Son, Limited, and Werner & Pfeleiderer, whereby that branch of the business of the former firm, which comprises the manufacture of the well-known "Perkins's patent steam-oven" has been combined with the London branch of the latter firm, who have so successfully introduced their highly-appreciated "Universal" and other mixing-machines, and the Wiegthorst draw-plate oven, into the

English market, we are in a position to promptly meet all demands that may be made upon us for any of our widely-known specialties. At the same time we are prepared to furnish all sorts and kinds of requisites for the baking and confectionery trade, and we will undertake any work in connection therewith, from the building and fitting up of a complete bakery to the supply of the smallest article required for the same. The head offices and works are at 43 Regent Square, Gray's Inn Road, and the show-rooms at 117 Queen Victoria Street.

QUESTION OF EXTRAS.

THE Second Division of the Scottish Court of Session has just disposed of an appeal from the Aberdeen Sheriff Court in an action by Peter Bisset & Son, builders, 152 West North Street, Aberdeen, against the Aberdeen School Board, for payment of 165*l.* 8*s.* 4*d.*, the balance of an account for extra masonwork at the Rosemount School. The pursuers explained that the work was certified by Mr. James Souttar, the inspector and architect, who, under the conditions of the contract, was declared to be sole arbiter. The defence was that Mr. Souttar was only engaged by the defenders to a limited extent, and that under the general conditions of the contract the pursuers were entitled to be paid for only such extra works as were authorised by Inspector William Dinnes. After proof, Sheriff-Substitute Brown found that Mr. Souttar was not the inspector, and, as such, the arbiter. On appeal, Sheriff Guthrie Smith recalled and discerned as craved.

The Second Division has recalled the judgment of the Sheriff, and reverted to that of the Sheriff-Substitute, finding the appellants entitled to the expenses of the appeal.

Lord Young, who delivered the opinion of the Court, said that, whilst he was not sure that the judgment of the Sheriff was not the best for all parties, still he could not assent to the proposition that Mr. Souttar had been appointed inspector and that his certificate was conclusive. At the same time, his lordship suggested that parties might arrange not to litgate further, but should refer to some respectable tradesman to examine the whole work, and see whether anything, and, if so, how much was due to the pursuers. He thought that that would be a becoming course, and he rather understood from what was said by the appellants' counsel that the parties, if they had not finally arranged to take that course, had been seriously contemplating it as the most judicious way of bringing to a determination this dispute, which he regretted had arisen.



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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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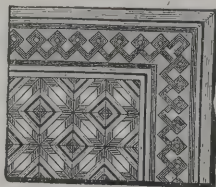
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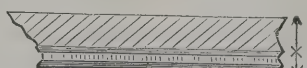


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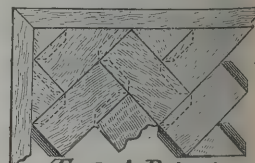
MOSAIC

PAVING.



OAK BLOCK FLOORINGS

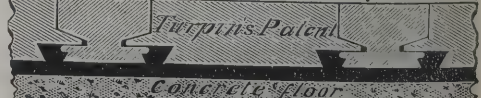
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System of Preparing for Laying inch Block
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NEW BOOKS.

WE have received from the offices of the "Amateur Photographer's Annual," offices, 1 Creed Lane, E.C., a copy of the 1893 edition of the "Annual," which will be of much interest to amateur photographers, who are now so numerous in all parts of the kingdom. The "Holiday Guide" section has been much extended and brought up to date, and will be found a complete gazetteer to the United Kingdom. A list of over a thousand dark rooms is also given.

MESSRS. E. & F. N. SPON, 125 Strand, have just published a treatise by Mr. W. H. Delano entitled "Twenty Years' Practical Experience of Natural Asphalte and Mineral Bitumen." The author treats exhaustively the nomenclature of asphalte and its combinations, of its uses, modes of application, and then proceeds to give a fund of information in general observations. It is a treatise that no one who has the charge of streets should be without.

MESSRS. CROSBY LOCKWOOD & SON, of 7 Stationers' Hall Court, E.C., have just brought out a new catalogue of books relating to engineering, applied science and technology, which will be invaluable to many for purposes of reference.

SCHOOL BUILDING IN AMERICA.*

WE can quite imagine this is a work that has frequently in the past been desired by architects. The practical work of school and schoolhouse building is dealt with from first to last. Notwithstanding a very large amount of letterpress, the book is mainly devoted page after page to illustrating school buildings, accompanied by the plans and all the detail drawings, even to the smallest details. In this way the book may be said to be an architect's portfolio of designs and plans, working drawings, &c. Twenty pages are devoted to the Fowler School House at Cleveland, Ohio. Illustrations are given of the several elevations, cross sections, four plans, viz. basement, first and second floor and roof plan. Fifteen pages following contain the detail drawings. The pages are some-

* *Palliser's Common Sense School Architecture.* By Palliser, Palliser & Co., architects, New York. (B. T. Batsford, publisher, 94 High Holborn.)

what larger than the illustrations given in the architectural newspapers, so that full justice could be done to the drawings. The whole of the specifications are given for a school at Cleveland, Ohio; five pages of small type. In addition to the great number of schools thus fully dealt with there are also convents and churches and other buildings; also the design for a school house which is not to be followed. There is much information as to sanitary matters, lighting included, and as to the selection of sites, and some amusing stories about competitions are told. The following is one:—

"A firm of carpenters and builders informed us that their city was to build a fine new building to cost between 80,000 dols. and 90,000 dols., and that they would like to submit a plan, but did not have the requisite ability to draw the plans themselves, neither did any of the draughtsmen or architects in their city, which contained about six architects' offices, and as we could not compete ourselves direct—the committee being dead against any Northern architects—therefore we concluded arrangements with the firm of builders to prepare for them sketch-plans and specifications with which to enter the competition with about ten others, all local productions, or from an adjoining city. The plans prepared by us were promptly adopted by the committee, and the builders who presented the same also secured the contract to erect the building, and in the main entrance a tablet was put up giving the names of the committee, architect, &c., and the name of one of this firm of builders was engraved on the tablet as architect. Later it leaked out through a draughtsman who had been in the firm's employ, but was now working in the office of an architect in the same place, that the plans and specifications for the building in question had been prepared by Palliser, Palliser & Co., and accordingly the architects in the city, who were very bitter about the whole matter, sent a communication to us, asking us to render the profession in their locality a service by coming out openly and giving the facts, as they stated that all the architects competing were satisfied in their own minds that the carpenter who claimed to be the architect, and whose name as such was cut on the tablet, could not do such a piece of work, as he had never been known to plan anything larger than 1,500 dols. to 2,000 dols. dwellings, and then in his own genuine style of carpenterology, but since the erection of the new building referred to he had gained a prestige over all the architects in the locality, which they did not relish."

As there are in this work considerably over 100 pages, the price (four shillings and sixpence) seems ridiculously small.

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AMERICAN FIRE BRIGADE MEN IN EDINBURGH.

The team of American Fire Brigade men paid a visit to Edinburgh and were entertained by the municipality. The team numbers nine men of the Kansas City Fire Brigade, and it includes and is in command of Mr. George C. Hale, chief of the brigade. The men are a picked team, and undeniably smart in appearance; all of them particularly young, rather short, like and active looking. One or two of them, in fact, have had a training as acrobats. They are accompanied by Mr. R. S. Tinsley, lately superintendent of public buildings in Kansas City. The chief of the brigade, Mr. Hale, has among his professional brethren a reputation for inventiveness, and he has brought with him for exhibition some of his special apparatus—in particular an automatic harness, which is practically instantaneous in action; and an engine called a water tower, by which a powerful jet of water can be delivered at a height of 50 or 60 feet above ground, and directed at pleasure. A couple of finely-trained horses have been brought over to work the apparatus and assist the team in their exhibitions. The visit of the team to the city naturally invites some comparison with the Edinburgh corps, and it will surprise some people to learn that while Edinburgh spends some 4,000*l.* a year on its modest brigade of thirty-eight men, Kansas City, with 65,000 fewer inhabitants, has a fire brigade of 160 men, on which it spends annually 36,000*l.* Of course the conditions in the two cities are essentially different, and there is no comparison between Edinburgh, with its solidly-constructed buildings, which are the best insurance against the spread of fire, and the jerry structures of a mushroom town like Kansas City, where the chief object is to get rich soon, without much regard to the sort of fabric in which the money is made.

TECHNICAL INSTRUCTION IN CHESHIRE.

AN interesting report has been issued by the Technical Instruction Committee of the Cheshire County Council in relation to the technical instruction that is being carried on in that county. The committee have agreed to the appointment of a deputation to visit various institutions on the Continent to see the systems adopted in regard to instruction in agriculture specially, and to make inquiries into the cost and results of such work before proceeding further with the matter of providing an agricultural school or college for Cheshire. A grant

of 1,000*l.* has been made to provide instruction on Saturdays for teachers employed in elementary schools, whilst a number of scholarships in agriculture, dressmaking, cookery and other domestic subjects have been arranged. An application for aid from a grammar-school led to an inquiry into the condition of the grammar-schools of the county. A sub-committee has been appointed to visit the various schools, and after meeting the respective bodies of governors, to report to the Technical Instruction Committee in what manner (if at all) they can be assisted. The committee have placed aside a sum of 10,000*l.* to be applied in assisting authorities in providing suitable buildings and apparatus for better carrying on the work of technical education, and also 6,000*l.* to be applied in acquiring and equipping a suitable building, &c., as an agricultural school for the county. Over 3,000*l.* has already been made in grants towards the erection of buildings for technical education, &c. Plots of land for experiments and demonstrations in agricultural processes have been secured. Before the committee commenced to make grants there were but 2,928 students in the administrative county of Chester who could, in the widest sense of the word, be said to be receiving instruction in technical subjects. That was in the years 1890-91. But for the years 1892 and 1893 the number under instruction at the various institutes and classes has been 8,598, or with teachers and attendants at special lectures a total of 9,813, whilst the number of local authorities who have adopted the Technical Instruction Act has risen from one or two to eighteen in two years.

HAYWARD'S PATENT STEEL LATHING.

WE have received from Messrs. Hayward Brothers & Eckstein samples of Hayward's patent steel lathing, plastered as well as unplastered. The illustration shows the elevation and section, which, when covered with plaster, is an efficient protection from the spread of fire. Fireproof construction is imperfect without an approved metal lathing, as wood-planked ceilings, linings and dados to walls, staircases and lift wells are considered favourable to the spread of fire. Hayward's patent steel lathing is made from sheets 6 feet by 2 feet, a convenient size for handling. The plain sheets, although light and pliable in themselves, when treated by Hayward's patent lathing machine become very stiff and rigid. The machine cuts slots, and raises ridges and corrugations in the peculiar manner seen

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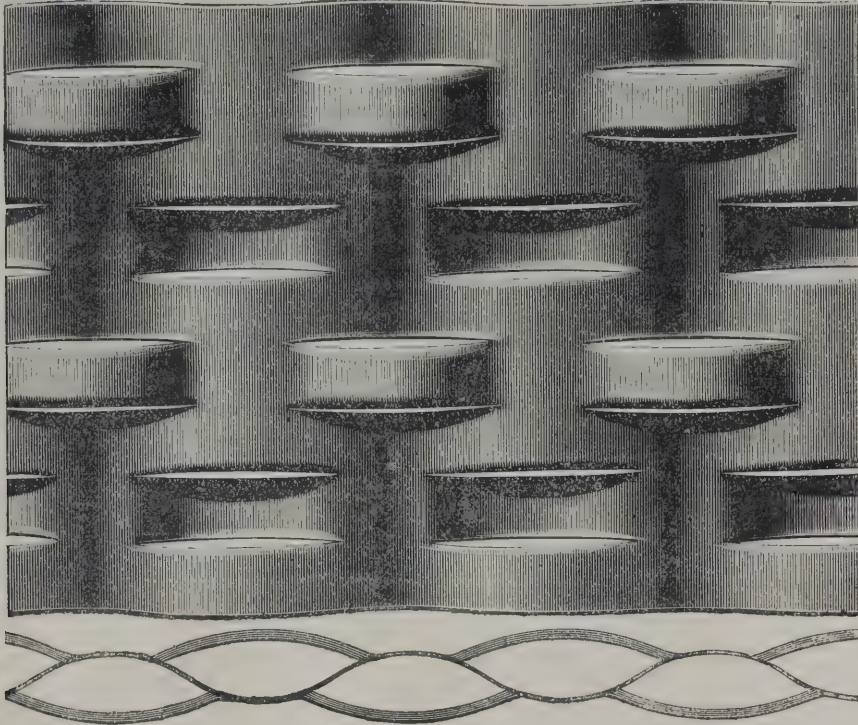
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in the section, being the same in appearance on each side; there are no sharp edges to cut the plaster; the metal is not cut away or across the fibres, hence the full strength of the material is retained, and the sheet becomes as stiff as a half-inch plank—so rigid in fact that a piece 6 inches wide, plastered and laid flat with a clear bearing of 18 inches, carried $1\frac{1}{2}$ cwt. in the centre

girders, wooden pillars, &c., or for covering for steam pipes, boilers, flues, &c., and will not expand by heat and detach the plaster. Plastered it weighs about 5 lb. per foot super. The cost is from $1\frac{1}{4}$ d. to $1\frac{1}{2}$ d. per square foot in the two thicknesses made. Further economy may also be expected in savings from reduction in fire insurance. Fewer supports are wanted. The



easily. The manner in which the sheet is slit affords a firm hold for the plaster, and is not liable to cut off the key. It is equally efficient when fixed vertically for partitions or horizontally for ceilings, and is quickly and easily fixed by a few wire nails. It is easily cut by an ordinary pair of snips, readily adapts itself to any form for cornices, for covering iron columns,

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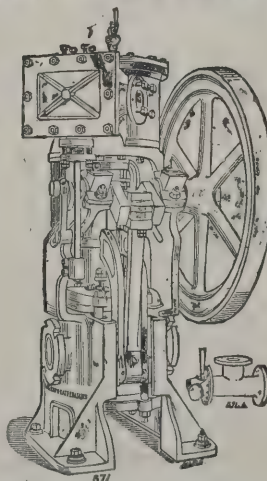
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WE recently had the opportunity of visiting the well-stocked showrooms of Messrs. Fletcher, Russell & Co., Limited, 115 Cheapside, E.C. As gas engineers and artistic ironfounders, Messrs. Fletcher, Russell & Co. deservedly enjoy a great reputation. Besides their establishments at Warrington and at Manchester, they have also chief works in London, at No. 41 Tabernacle Street, E.C. At the Cheapside House, the ground floor and three floors over are entirely devoted to the display of their well-known specialties in mantels, mantel registers, lavatories, gas specialties, &c. The excellence of these has long been appreciated by London as well as by north-country architects, and they have also been considerably used abroad, many orders being at present in course of execution for Paris. The arrangement of the various suites of showrooms has been carried out in an orderly and methodical way, so as to give an exhaustive display of goods for all requirements in their own department. The topmost floor, we understood, was devoted to the purposes of the counting-house. The floor below (third floor) will occupy a visitor some considerable time if he walks round and inspects the display of goods. In addition to registers, stoves, mantels, overmantels, lavatories, and goods in connection, there is an ample display of what we may call knick-knacks, fancy articles of a kind that are indispensable, and not for ornamental purposes alone. Articles, for instance, that make up the equipment of the writing-table, bevelled glass mirrors, wall brackets, &c., mounted in ornamental metalwork. Fireplaces with overmantels and bevelled mirrors are seen, elegant and effective, though not costly as to price. Indeed, the remark applies throughout, for even in the class of work of the highest elaboration to suit the most sumptuous requirements, the prices are remarkable for their moderation. Attention may be called to one or two specialties, as space will not permit of doing justice to all. No. 125, a combination mantel and register, has a pleasing effect; it is made in different sizes, has tiled sides in

good design, patent fireproof back, and has been much patronised by architects. It is well suited for any description of room, being made in various sizes. Much might be said in praise of schemes of colour worked out on all the goods throughout the showrooms. Often very delicate tints have been employed, adding greatly to the general effect. It may be mentioned that No. 125 can be had with cast-iron sides and fittings if preferred in place of tilework. The flueless hall stoves of the old C pattern have a great reputation, and these can be had in many degrees of elaboration for ornamental effect. The Leopold mantel register, with No. 6 overmantel, is one well worth inspection, the ornament on one we examined being particularly pleasing. The Leopold is also made in various sizes—that for bedrooms is a compact little object that will find favour with every one. There is a large and varied assortment of fine lavatories, fitted up in several cases with bevelled glass mirrors, tile decorations, &c. These also are made in several sizes. Basins to suit all positions and requirements can be had. Among other articles on this floor are tables for restaurants, oblong and round, with marble or wood tops, samples of chairs for theatres, ships' chairs, &c. The second floor is devoted nearly entirely to the display of mantel registers and stoves, gas stoves, tile registers and interiors, for all purposes and kinds of buildings. The "Palatine," No. 260, should have special attention drawn to it, as most suitable for heating warehouses and schools. It is furnished with a ventilating grate, or with a non-ventilating grate, as may be desired. The grate has a large and powerful fire. The back is doublecased, fitted with gills, close jointed, and extra strongly made throughout with ventilating fender for admitting fresh air. It is made expressly for the purpose of heating large spaces. Chimney pieces, mantels or mouldings can be fixed outside of the grate (if desired), where more decoration and effect is wanted. The grate, as supplied, is self-fitting and is complete in itself.

The new mantel register, No. 140, with No. 17 overmantel, also made in various sizes, is particularly good, and the overmantel a handsome one, with central and two side bevelled mirrors. No. 111, which can be fitted with No. 1 or No. 10 overmantel, has handsome tile fittings, and is well suited for a drawing-room, or in its other sizes for sitting-rooms, bedrooms, &c. No. 109 shows the same mantel register without tiled sides. Space, however, will not permit of any further description of the variety of registers, stoves, &c., some one or other of which will suit any taste and requirement.

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The first floor is devoted in the main to display of such goods as are suitable for drawing-rooms and rooms of the same more stylish character, the collection being of very varied and high-class character. One or two may be mentioned. No. 270 recalls to mind the old hob register, a very handsome piece of work. No. 248, the "Withington" patent grate, is another handsome piece of work, with tiled sides, portable canopy and flue box, sliding ashpan, &c. This grate is supplied as a register with tiled sides, or as an interior. It is constructed to give great heating power with a very small consumption of fuel by its heat-reverberating principle, is partially smoke-consuming, and will burn almost any kind of coal. Smoky chimneys, back-draughts and blow-downs are, by the nature of its construction, almost impossible. By the air-regulating ashpan placed under the fire, combustion can be regulated to any degree of slow or semi-slow combustion. Special facilities are given for cleaning out the flues, and sweeping of chimneys is almost dispensed with. No. 152 is shown as an example of a cheap mantel, and is made in two sizes, 36 inches by 38 inches and 38 inches by 38 inches, and in varieties of decoration and finish.

No. 155 is a very handsome mantel in various styles of decoration, with overmantel and bevelled mirrors in character, and is the latest addition to the catalogue. The sizes are 38 inches by 38 inches and 40 inches by 38 inches. No. 87, the "Victoria" mantel, is a beautiful one for drawing-rooms, &c., that are furnished in sumptuous style, and has an excellent finish in the overmantel No. 19, but No. 18 or 20 are equally well adapted for the purpose. The Victoria can also be had fitted with bronze relieved with brass and copper, interior alcove and portable dog-grate No. 280.

For gas-stoves there are shown excellent tiled back-plates, which may be had either flat or recessed. No. 135 mantel, made in three sizes, is capitally adapted for parlours, libraries, small sitting-rooms, &c. The ground floor contains, among other goods, those suited for very large requirements—one being the Grosvenor range, with coal fire and gas ovens combined, and circulating boilers. Also, an elaborate alcove canopy gas-range with tiled interior and exterior. We have already gone to such length that space will not allow us to refer further to the gas-range and fire department. In the basement, amongst the display are included samples of Messrs. Fletcher, Russell & Co.'s well-known laboratory appliances, which also have so great a reputation here and abroad. In concluding it may be of interest to mention that the company's

loose enamelled linings for ranges have a great advantage in the fact that they can be so easily taken out for cleaning purposes and replaced. Also, we hear, that during the last few weeks the company have been appointed sole makers to the London School Board for a range specially designed for use of the cookery classes.

EDINBURGH WATER SUPPLY.

A SPECIAL meeting of the Works Committee of the Edinburgh and District Water Trust has been held to consider the expediency of taking steps to obtain Parliamentary powers in the next session of Parliament for bringing in a supply of water from the Manor Valley. A supplementary report was submitted by the engineers stating that the result of the boring in the Manor Valley was that the depth at which the puddle-trench required to be put down in the Manor Valley proper was on an average 26 feet, and 90 feet in the north valley, and that this involved an addition to the estimate of 50,000*l.*, making the total cost of the first instalment of 10 million gallons per day for town supply 652,364*l.*, which is equal to 65,236*l.* per million gallons. With reference to the Talla scheme, it was reported that the average depth required for the puddle-trench of this reservoir would be 40 feet, which was 10 feet more than what was assumed in making the detailed estimate of the cost of the Talla scheme, and that this involved, so far as this reservoir was concerned, an addition of 3,500*l.*, making the cost of the first instalment of 7½ million gallons per day 587,500*l.*, which is equal to 78,333*l.* per million gallons. The engineer added:—"Having carefully considered the whole question, with the additional information obtained by the boring operations at Posso and the Talla, we beg to state that we adhere to the opinions expressed by ourselves and the advising engineers in their report to the trustees of date August, 1891. Seeing that the Manor water is the nearest source in point of distance to Edinburgh, that the water to be obtained is the best in point of quality, that Parliament some years ago did sanction the appropriation of it for the supply of Edinburgh district, and having regard to the cost of the first instalment being the least of any of the schemes, we strongly recommend the adoption of the Manor scheme." A letter was read from Councillor Auldjo Jamieson, who could not be present at the meeting, suggesting some additional information as to the effect of the measures taken to repress waste. Bailie Archibald

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the convener, went over the various reports, beginning with that of the Works Committee of date March 12, 1890, as to the necessity of taking steps to obtain a new supply of water; also the remit to the consulting engineers, Messrs. Hill, Gale & Mansergh, on the same question, and their report and recommendations on the subject; also the remit to the sub-committee, consisting of the convener, Bailie Walcot and Councillor Auldjo Jamieson, and their report on the subject. Subsequently it was agreed that the engineers should supplement their report by stating the various measures adopted within the last year or two for the better prevention of waste and the results therefrom.

THE SANITARY REGISTRATION BILL.

A PUBLIC conference on this Bill was held at St. Martin's Town Hall on Wednesday, the 7th inst., Mr. Andrew Stirling, president of the Sanitary Assurance Association, in the chair. The Chairman, in opening the proceedings, invited the fullest criticism of the Bill they were met to consider. The importance of the subject demanded their most careful attention, and when it was remembered that the Bill was the first and only attempt to deal with the question of sanitary registration, the Bill was only second in importance to the principle it aimed at.

Mr. Mark H. Judge, A.R.I.B.A., proposed the following resolution:—"That in the opinion of this conference it is desirable that a law should be passed providing for the sanitary registration of buildings by the Public Health Authorities." Having seen it announced that Sir Edward Reed and Mr. Aird intended to block the Bill, he had specially invited them to attend the conference. Sir Edward Reed had replied to the effect that he had only blocked the Bill for the purpose of securing further consideration of some of the details, particulars of which should be furnished as soon as possible.

Mr. Hugh Leonard, C.E., seconded the resolution, and Sir Joseph Fayrer, K.C.S.I., M.D., F.R.S., spoke strongly in support of it, urging that in view of the probable spread of cholera to this country, so important a measure ought not to be blocked.

The resolution was passed unanimously.

Mr. R. Biddulph Martin, M.P., spoke at considerable length on the details of the Bill, which he said they were prepared to amend in Committee in certain respects; but the great principle of registration they were strong upon, and if the second reading should be blocked, so as to prevent the Bill getting into Committee this session, they might rely on his introducing the Bill again next year.

The Rev. H. R. Wakefield, M.A., chairman of the Sandgate Local Board of Health, then proposed:—"That this Conference hereby authorises the Chairman to sign the submitted petition praying Parliament to pass the Sanitary Registration Bill brought in by Mr. R. Biddulph Martin, M.P., Sir Algernon Borthwick, Bart., M.P., Dr. Chas. Cameron, M.P., Dr. R. Farquharson, M.P., and Mr. Wootton Isaacson, M.P., with such modifications as consideration in Committee may show to be desirable."

This was seconded by Mr. Timothy Holmes, F.R.C.S., and spoken to by Dr. Bernard O'Connor, Mr. H. Rutherford, barrister-at-law; Mr. J. Marr, Mr. W. H. Branch and others, and carried unanimously.

OFFICE BUILDING IN AMERICA.

A TREATISE on "Modern Office Buildings" has been written by Mr. George Hill, consulting engineer, New York. At the outset he lays down the elements of a successful building, and then proceeds to consider each of his heads in detail. Among these much space is devoted to elevators as a principal feature in regard of ease of access. Plans of various styles of office buildings are given, also a great many tables relating to brick and steel skeleton construction in reference to the different number of storeys, the amount of area, costs and rents. We cannot refer more at length to the subject further than to give a short extract from two or three of the heads.

Mr. Hill begins by saying this term, "Modern office building," is used to describe the mammoth structure of many storeys that the conditions of our present business life require us to erect in all centres of population where the fever of money-getting is permitted to have full swing, unhampered by any traditions that involve avoidable loss of time.

Whether this building is so high by reason of the desire of men of all callings to come as close to a given centre as possible, to the desire of men of similar callings to be as close together as possible, is due to the superior service that can be rendered for the same outlay, or is due to the necessity to procure enough rentable space to be able to pay interest on the total amount of money invested, might be discussed at considerable length, but is foreign to the present subject except in so far as it furnishes one of the limitations of the problem.

The elements that must be combined in the successful building are:—

- (a) Ease of access.
- (b) Good light.

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- (c) Good service.
- (d) Pleasing environment and approaches.
- (e) The maximum of rentable area consistent with true economy.

- (f) Ease of rearrangement to suit tenants.
- (g) Minimum of cost consistent with true economy.

These may also be separated into two classes—those that particularly interest the tenant, which are the first four, and those that interest both tenant and landlord or the landlord alone, which comprise the balance. At first sight it might seem as though the two interests were antagonistic, but a little thought will show that if the landlord sacrifices the tenant's interest he will in some ratio affect his own by reducing the value of the space he has to rent; on the other hand, he may sacrifice his own interests in a way that will render it difficult to secure it proper return, by unnecessarily wide halls, for example, and it is to establish a proper relation between these various elements that the following is offered.

(a) *Ease of Access.*—This can be had either with a low or a high building, of which the latter only interests us. With the floors placed one above the other it is necessary that they be reached by elevators, and the solution of the problem depends on them almost entirely.

(b) *Good Light.*—This is of the utmost importance, and as is usual in such cases there is a radical disagreement at the very start as to the requirements. Some hold that only a north light is truly good, while others aver that no building is well planned that is not so arranged that there is a little sun in each office during part of the day, except perhaps in the lower storeys. Now the writer is one of the latter, and, if it were essential that the point should be settled would be ready to discuss it to any length and could perhaps convince a goodly number of those who were inclined to think so in the first place, but certainly would not convince many others.

Fortunately for our present purpose it is not of the slightest importance which way the light comes from since while we shall speak of its coming into the rooms, and thus make a certain arrangement preferable, if the plan were reversed it would still be desirable to keep the axis in the same direction so as to get more of the north light.

The first point then is to get the proper direction for the axes of both the building and the courts. In New York we generally have this already determined by the subdivision of the city into rectangular lots with the long lines making an angle of about $21\frac{1}{2}$ degrees east of the meridian, but elsewhere

and especially where it is possible to make a selection, it should be on a bearing of north $22\frac{1}{2}$ degrees east, which agrees quite closely with the New York layout.

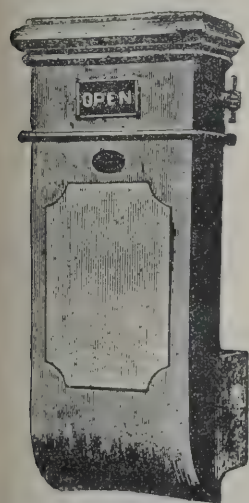
The axial line that divides the hours of sunlight equally is the line that should be used for the axes of the building and of the courts. It will further be evident that if the courts be made square or nearly so they will be so proportioned as to throw the shadow of the south wall on the north wall at the highest point that it can reach, and only the top of the court will ever get direct light, while if the court be made rectangular and with the long axis north and south, the light at noonday will penetrate to the very bottom during at least a part of the year, and will go the maximum distance at all times. If the court is open to the south every office that gives on it will get a glimpse of the sun every day that it is visible at all. The courts should be generally from 6 to 25 feet wide, depending on the width of the lot and the size of the offices.

From this it would follow that the ideal location would be either on the north-east or the south-west corner of the street, according to preference for either north or south light.

The light must be let into the offices through windows, no matter where it comes from, and these must be made ample. Requirement (f) makes it desirable to use a unit for an office of about 9 by 15 feet, and to properly light this unit requires a window at least 4 feet wide and 6 feet high, with the top not more than one foot below the ceiling. The particular point to watch is that where there are large arched openings the offices that come partly behind them shall have plenty of light, either by openings at the sides or by piercing the spandrel walls, or in some other way, as the volume of light from the top of the window is of much greater lighting value than that coming in at the floor. Under no circumstances should that part of a window that is below a point 20 inches above the floor count as a useful part of the opening. This is a particularly hard condition to satisfy, it is admitted, but it is one that is unavoidable and must therefore be met in some way.

The light in a room is also made much more effective if there is a certain amount of clear wall space on each side of the window, broken in fact only by the furniture. The ceiling should be hard finished, as this reflects much light down to the desks. For the same reason the aim should be to have all of the rooms rectangular and without breaks, alcoves or other similar construction, as they all take from the light and interfere with the tenant's use of the office in this way.

(c) *Good Service.*—Heating and ventilation should go



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together, and form a serious problem, since cost and methods of construction will not permit of a complete indirect heating plant, and it is also probably the case that it would not be satisfactory to the tenants, while the cost of operation would be very great. Fireplaces are not permissible, since they will in almost every case prove to be an unmitigated nuisance, always coming in the wrong place, taking valuable room just where it is most needed, and forming a serious item of cost when properly treated. They serve, however, to take some of the foul air from the offices, and so do a little good to justify their existence. Probably the removal of the foul air can be sufficiently well accomplished by putting in transoms over the hall doors and opening the halls to the outer air at some convenient point where there will be no back draught into the halls. If it is preferred, moderate-size ventilating pipes could be run to each of the offices, being collected into a main stack running vertically through the building, and the circulation assisted by means of a small fan run occasionally simply to start the circulation. Exhaust fans have a way of taking their air along the lines of least resistance, and that makes it undesirable to depend on them entirely.

To introduce the needed air, and to warm it to the proper temperature, it is desirable to use a direct radiator, with a box base, connected with the outer air by means of a small galvanised iron pipe with a damper in it, so arranged as to open the base to the air in the room as it closes it to the outer air. Then in the morning, when it is desired to warm up quickly, the damper would be closed to the outer air, and the air in the room would be warmed by the circulation which this radiator would set up. As soon as the air was of the proper temperature, it would be maintained at this point by the opening of the damper so as to admit the fresh outer air, warming it as it enters. Such an arrangement is no novelty, and has been found to be generally satisfactory.

The Plan.—There must be on each floor the elevator-well, the halls, the stairs and the toilets. Each of these require a certain amount of space, and for economy of construction it is desirable that the various floors be made duplicates as far as possible, while for some of the features it is a necessity.

The halls depend on the size of the building to a certain extent, but for the usual case of the 25 by 100 or 50 by 100 feet building they must be made as small as possible. Then we would make the hall on the ground-floor as direct as possible from the street to the elevators, and 8 feet wide, with a space in front of the elevators of the size of the well. For the upper

floors, if the space be made 4 feet wide in front of the cars and the halls 3 feet 10 inches wide, it will be ample if the trim is not too projecting, the space in front of the cars being joined to the side halls either by a sweep or straight.

For the stairs it should be kept in mind that they are for use only occasionally, and are in no sense ornamental features that are indispensable, except occasionally when they are meant to lead up to grand offices on the first floor above the street. Generally the money that they cost could be spent to better advantage in the enrichment of the entrance-hall. Leaving the question open as far as the special cases go, it may be said that if through the balance of the building they are made 2 feet 6 inches wide, that will be sufficient for all practical purposes. They should be placed at the end of the hall or at some other out of the way place, and be made as plain as possible.

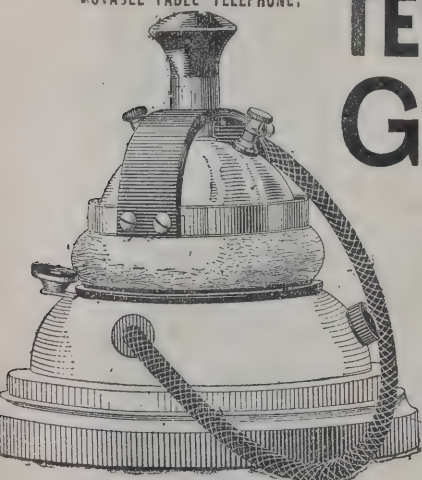
The size of the offices must be so arranged that the man who wants a single office will get just sufficient, while the man who wants more gets all that there can be given on a floor except a minimum space reserved in the least desirable location for the toilets and stairs. This subdivision forces one into a column treatment of the façade, so as to get sufficient light for all of the offices, and also indicates a spacing of the columns in the framing that is the most economical as a general rule.

Such an arrangement gives opportunity to make the masonry piers of sufficient width to satisfy the sense of proportion regardless of their height, and introduces no greater difficulties into the solution of the problem than were there before, nor will the design of different office buildings possess any greater similarity if so laid out than they do now.

The Method of Construction.—To put it in the form that it presents itself to us would be to say, steel skeleton *versus* masonry. The elements that must decide, if we are to decide intelligently, are numerous, and each must be given its proper weight.

We can build either all skeleton or all masonry. We can also, if we please, build a masonry wall carrying only itself, and then place columns behind it to carry the loads; but this does not seem to be the best construction, since it wastes money, wastes space, and will surely lead to some very ugly cracks that never can be closed. It may possess some advantages, but they are not easily apparent. The better way would be to do all of either one thing or the other. Taking, then, for consideration the alternative, all masonry or all skeleton construction, we must consider that the masonry, if the walls are built of the thicknesses required by the New York laws, will

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take up more space than the steel walls, the amount being given in one of the tables for all walls from one to twenty storeys in height. Then, if the building is placed on a very narrow lot we must have some bracing, and the masonry walls do not readily lend themselves to this. No doubt it could be done, but it is probable that it would be far from a satisfactory piece of work, and would probably lead to serious trouble in the future.

If the front and rear walls are not too much pierced, it might be safe to build with such bracing as could be had in masonry, but it would not be positively so.

The following are Mr. Hill's recommendations as to materials:—

The frame should be of mild steel, columns, girders, beams, &c., using the usual commercial shapes. The various parts should be rivetted together and the column connections so made as to maintain the full strength of the column.

The walls should be made with buff brick and terra-cotta fronts and common brick backing for the façades, with the storeys forming the basement of stone if desired, although this requires a judicious selection of the stone. The rear walls should be made with common brick and the courts either lined with enamel brick and with the beds and builds made flat, which would be the case wherever the courts are internal ones, or else painted three coats of paint finishing with one coat of enamel paint. The facing brick, where of a different size from the backing, should have every brick anchored with a Morse wall-tie as often as the courses fall even. The inner faces of the walls that are exposed to the weather should be furred, using the usual 2-inch furring blocks, the usual hollow bricks of Haverstraw size having proved to be a delusion so far as excluding moisture goes.

The fireproofing may be either of the hollow flat arches familiar to all or of the new Manhattan type, either having proved to be good. The blocks, if used, should be so used as to fill up nearly the entire space between the flanges of the beams so as to require the minimum of filling, and the pipes and wires run in shallow channels run in the under-flooring. The columns should be fireproofed either by the use of slabs of fireclay, each slab securely wired to the others in the course, or else the column should be outlined with small L's and wire lath stretched over and plastered thoroughly, the writer's preference being for the wire lath and plaster. Every portion of the frame should be so treated, including the columns that are so laid out as to aid in the wind-bracing, and especially covering

all columns that are enclosed in stone. If the framing is carefully laid out the beams will so come that it will be practicable to show them, using either high skewbacks or the Manhattan arches without the hung ceiling below, thus effecting a small economy in cost.

The flooring in the halls should be either a marble mosaic or else a granolithic laid with a marble border, there being a small difference in favour of the granolithic. The toilets should be similarly treated. In the offices the flooring should be of Georgia yellow pine left untreated, but of course mull-dressed and carefully laid.

The plastering should be a rock plaster, hard finish, with the plaster carried into all jambs and reveals, with the corners rounded off and a small cove at the ceiling, say of 6-inch radius. The partitions should be made of a rock plaster put on corrugated iron lathing supported at intervals of about 3 feet by means of small channels or l's secured to the floor arches above and below. These partitions are but 2 inches thick, can be easily removed, and should be somewhat cheaper than the ordinary 4-inch blocks.

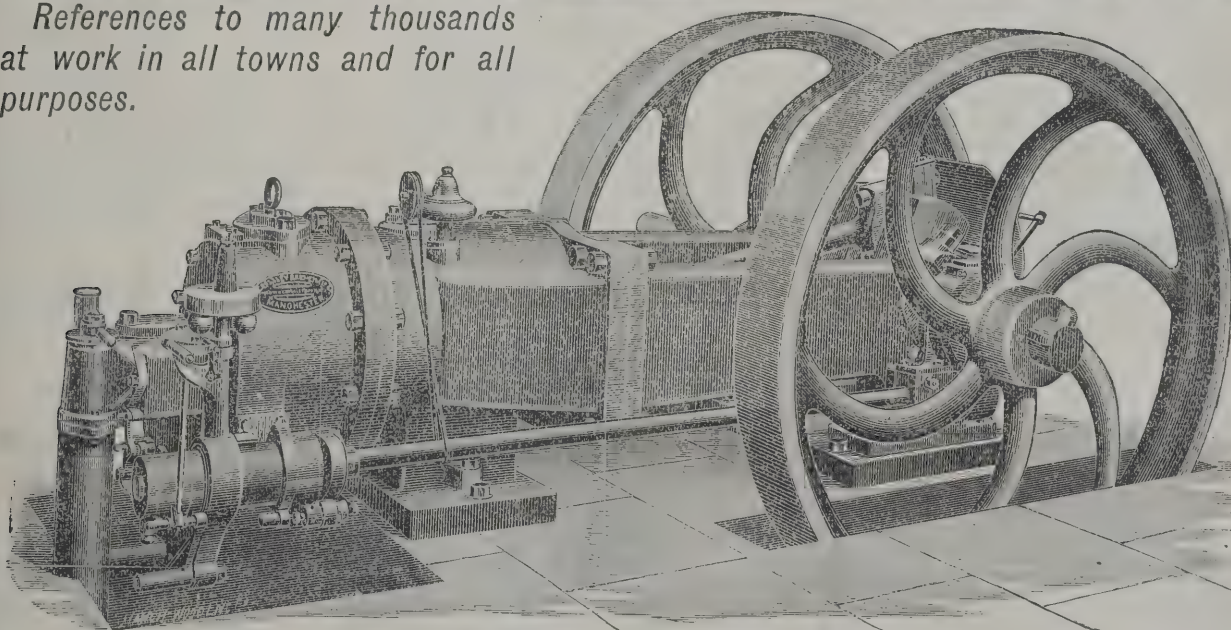
The trim should be of white oak, filled, hard oiled and rubbed to an eggshell finish, the base being made about 1½ by 8 inches and the architraves about 4 inches wide over all, with a backing and back mould carried down to the floor, affording something for the base to stop against and mitreing around all openings. The window trim would be similar in character, with the inner moulding carried around across the top of the base and under the stool cap, so as to form a small panel under the sill. Chair rails and picture mouldings are matters of choice, and the former is seldom of any great use.

The halls should have either a Keene's cement or Mycenian marble wainscot with marble base and cement cap, or the rock plaster can be run for a cap and a marble base put in, and then the space between painted with an enamel paint.

The toilets should have the water-closet partitions made of oak carried about 10 inches above the floor on brass legs; the urinal stall should be made of marble and the urinals either the long-lipped urinal with the "Parsons" flushing tanks for each stack, or else Mott's "Shanks" patent with individual tank. The water-closets should be either a wash-out closet or else a pedestal hopper with the seat simply a wooden rim carried on brass brackets and a copper-lined wood cistern. The wash-basins should be oval with the patent overflow and half S traps close under the fixture, with the supply pipes placed close under the slab and with shut-off cocks for each one.

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FIREPROOF CONSTRUCTION.*

AT the monthly meeting of the Chicago Chapter of the American Institute of Architects a paper was read by Mr. R. Guastavino upon the development of tile fireproof construction.

After referring to a large experience in construction since his course of study in the School of Architecture in 1864, and the well-known constructive knowledge of Chicago architects, Mr. Guastavino, alluding to the tile arches, or the timbrel arches as they are more properly called in Spain, in consequence of the lightness and small thickness, and in order to fix principles, started by saying that this system belongs to the cohesive construction.

Divided in two classes, the first we shall call "Mechanical Construction," or by gravity. The second we shall call "Cohesive Construction," or by assimilation.

The first is found in the resistance of any solid to the action of gravity, when opposed by any other solid. From these conjunctive forces, more or less opposed to one another, results the equilibrium of the total mass, without taking into consideration the cohesive power of the material set between the solids.

The second has for base the property of cohesiveness and assimilation of several materials, which by a transformation more or less rapid resembles nature's work in making conglomerates.

We can give another definition more precise and comprehensive for both systems, in saying that the first or mechanical system is that all the pieces can be separated one by one and then rebuilt in the same or similar manner. To this class belong the pyramids of Egypt and the Greek temples, &c. In "cohesive construction," on the contrary, the components cannot be separated without destroying the integral mass. To these belong the Babylonian walls of brick with hydraulic mortar; the vaults and cupolas of the Assyrian, Persian, Arabian, Roman and Byzantine, the antique and Middle Age conglomerate construction.

The structures built by the "gravity system" can be at any time taken down, in the pieces out of which they were formed. Thus the stone or brick that yesterday formed part of a temple or monument dedicated to the memory of a hero can to-morrow belong to or form part of the walls of a stable; while, on the other hand, though man cannot again use the parts of cohesive construction for modern buildings, their ruins inspire respect

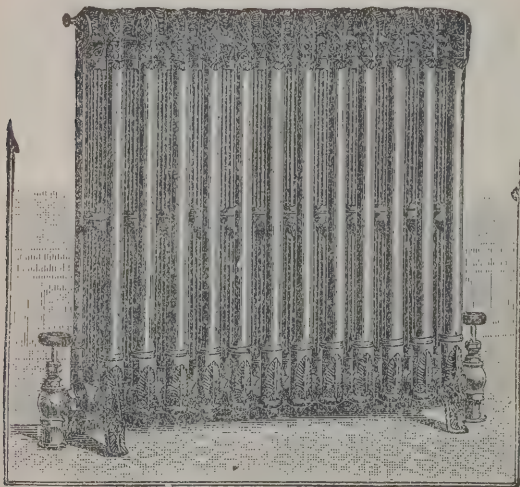
* From the *Inland Architect*.

and veneration, and only nature with its slow but sure work of disintegration can take from this style of building its materials for her immense laboratory.

The materials employed in the construction by gravity only require the physical quality of hardness; for the "cohesive construction" the materials must not only have proper physical conditions, but it is absolutely necessary to take into consideration the chemical properties of the substance employed. The use of the "cohesive system" was rendered impossible to many nations that had neither the material nor the knowledge of its use at their disposal, while on the other hand all the civilisations and all nations could make use of the gravity system.

The base of these materials are mortars that do not require exposure to the air for their transformation or setting qualities, that is, hydraulic limes and cements, but for our specialty we must have cements of the quality of Portlands.

The way in which this kind of arch works is as follows:—A "timbrel vault" of a single thickness of brick or tile has no more resistance than an arch or vault built in the "gravity system," because no matter how good the mortar may be there is only one vertical joint, and the bricks or tiles are working as voussoirs, consequently this form of arch belongs to the "gravity system;" but if we put another course over the first, breaking joints and laid with hydraulic material, we will have the action of the cohesive force; in this way the mortar laid over the first course, or extrados, takes bond with it, and also with the course laid on top. As soon as the cement sets we will have shearing resistance represented by 17,820 pounds per square foot. In this manner we introduce a new additional strength to the arch, which is a peculiarity of the "timbrel arch system." In the "gravity system," the strength of gravity alone is the only force keeping the voussoirs in place by pressure against each other in the joints. These joints are not protected, and any reduction in the width of the joints, in consequence of pressure, or weight on the arch, compromises the setting of the mortar. For this reason in the "gravity system" the mortar serves only as a cushion, also, if cement mortar, because of bad setting, and adds no strength to the arch. But in our "cohesive system," with horizontal broken joints, with 17,820 lbs. per square foot shearing strength, the reduction in the vertical joints is protected absolutely, as can be proved by the following facts:—First, we can build barrel arches of 20 feet span, and dome of 60, 70, or more, only 3 inches thick, using a centre of 1 inch thick, and moving it along as soon as a row of tiles are laid, which usually requires



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about fifteen minutes; second, it is common to see the working men walking over the arch, free from centres of any kind, some hours after it is built; and third, we can run the centre under the arch again when it is completed, which is the most practical illustration that the arch has had the absolute repose necessary for its settlement.

These three remarkable circumstances are of great value to architects, as they can be put in the specifications and can be depended upon as absolute proof of the safety of the construction.

So we have for the "cohesive construction" the following advantages over the brick arch or any arch built by mechanical construction:—

First—The protection of the vertical joints by introducing the new strength coming from the horizontal breaking joints.

Second—The less number of vertical joints, amounting to only five per cent. of the full span, while the brick arch has ten per cent.

Third—The resistance to deflection (bending movement).

The result of these advantages is the surprising strength of the "timber arches," so that no one can at first understand how fifteen or twenty-foot beams, arches and domes of seventy and more foot span, three inches thick and ten per cent. rise, as we before said, can be laid, taking away the centres and giving them over to the uses of the building in a few hours, when an arch of brick, six-foot span, four inches thick and ten per cent. rise, requires for constructing it strong and heavy centres, with repose for several days, and then is not a safe construction, as this span requires eight inches of thickness, as all architects and builders know.

We can consider as a safe relation between the brick and "timber arches" four feet six inches span, ten per cent. rise, four inches thick, with cement mortar as is usual in buildings, as equivalent to a ten or twelve-foot span "timber arch" three inches thick, eight to ten per cent. rise.

The impossibility of having a flat arch built with voussoirs, principle strictly tight, in consequence of the imperfections and impossibilities of having a tight and well-set joint, because this joint is only worked as a cushion, is one of the main objections that the Catalonia and Valencian architects have against the use of flat hollow block arch for fireproofing buildings. The slightest settlement in the centre, so common in these kind of arches, opens the joints, and in case of fire you will see at once the smoke passing through and in consequence showing that air and gases pass from one habitation to the other; and

although the cheapness of iron and the facilities that we have for manufacturing any kind of claywork gave a great impulse about twenty-five years ago to the system now in use—that is, hollow block iron beams, and so on—the said inconveniences soon became noticed, and it was found to be unfitted for our conception of fireproof buildings; but in places where we had never considered that system and never used it under any circumstances, as in cellars, ceilings, and very few in the first floors, because the places where it is most necessary to have a homogeneous, tight and solid material as a general base for the building are the ceilings of cellars, because that is where the emanations, moistures, fires and complications of pipes, wires and conduits make it more necessary to have a perfect masonry construction.

But I do not say that the tile system is the only one adjustable for everything. The flat block ceiling has its advantages. Progress and new necessities and the manner in which we consider buildings to-day has somewhat changed their character, and many of them are not well adapted for full masonry construction. For instance, an office building cannot be so well adapted as a church, or hall, or library, and other public buildings of that character, but in each case the principle can be adapted with modifications always beneficial. With the tile method of construction the desirable forms are as follows:—1. Walls: the most desirable ones should be hollow. I do not mean walls built with hollow materials, but walls built hollow, or tubular columns of clay, cement or stone combined with iron.

2. In ceilings it is preferable to use domes instead of barrels with solid or cohesive materials. The barrel arches are an exceptional construction and good under some circumstances, but they are not the best for cohesive construction, the right one being as already stated, domes, and the spans should be 12 by 15 feet or 14 by 17 feet.

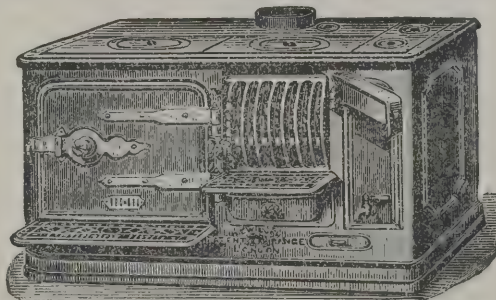
3. As a principle for the conception of any building inside of the system the following conditions must be taken into consideration as guides:—(1) Floors must be perfectly tight between, so as to have an absolute intercommunication, and to be as near as possible airtight. (2) No wooden flooring, wooden wainscoting or wooden casings should be used. (3) Doors, windows and any openings should be prepared in such a manner that any fire in one or more rooms could be isolated by stopping the alimentation of combustion, that is, combating the fire by direct asphyxia or want of air, which is a very easy matter if well prepared for; but for this purpose

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buildings must be divided into three different groups, which would require three different treatments.

First Group.—Private houses, office buildings, hotels and public buildings.

Second Group.—Department stores, factories.

Third Group.—Storage buildings.

For the first, tile construction has the advantage that each room can have its special dome supported by double tile partitions and main walls all around. The partitions should be placed as much as possible one above the other, which practice is one of the recommendations of good Classic construction. The same should be the case in office buildings. Each room could have a dome supported by double partitions. The same also in hotels.

For the second and third groups the precautions that should be taken are the same as in the first group, but in addition all windows and doors must be provided with double doors or shutters, one of them of sheet-iron, so that all joints can be re-joined from outside in case of necessity.

I will remark, by the way, that to develop this system a Spanish architect, and especially a Catalanian, one in his own country, has an advantage. First, there the architect who is inclined to the constructive parts of his profession has an opportunity at any time to be not only the architect of a building, but also the contractor of the same, so he is able to do as he pleases in regard to construction, and he feels safer. Of course everybody knows that the architect is directly responsible before the owner, the public and the authorities, so it is hardly strange that practical and intelligent owners in Catalonia do not object to this, but, on the contrary, they prefer to give to the architect the contract, asking him to give bonds and guarantees. It is also easier, because by law the architect is directly responsible for any trouble on a building. The building department also compels the owner to have a responsible architect on the building, and if the architect is the contractor the ordinances leave him free to do as he pleases in regard to construction, restricting only the hygienic part and urban lines.

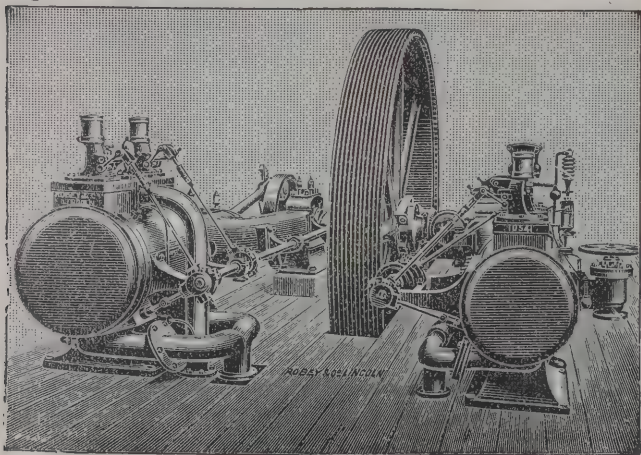
THE Baths Committee of the Liverpool Corporation have resolved to recommend the Finance Committee to offer a premium for the design of the new baths which it is proposed to erect at the St. George's Pierhead, the construction of which would not cost more than 20,000*l.*

SEWAGE PURIFICATION, HUDDERSFIELD.

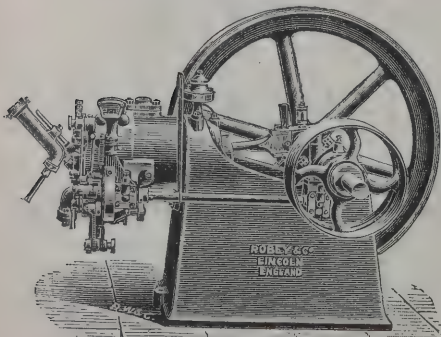
THE new sewage disposal and purification works, constructed by the Huddersfield Corporation at a cost (including intercepting sewers, destructors, sludge presses, electric light plant, &c.) of about 69,000*l.*, have been opened. The Corporation acquired about 44 acres of land at Deighton for the scheme, but the works and buildings only cover an area of 8½ acres, and the remaining space has been laid out as a small park. Mr. R. S. Dugdale, C.E., the borough engineer, designed the scheme, as also the intercepting sewer conveying the sewage to the works, which are capable of dealing with 7 million gallons of sewage per day (or the sewage from a population of 250,000 based upon a flow of 31 gallons per head); but the present dry weather daily flow is about 5 million gallons. There are 24 precipitation tanks, each to hold 47,500 gallons, and the same number of small polarite filter-beds. The process of purification may briefly be described as follows:—The crude sewage is received in the "roughing" tank; it then passes the screening chamber and is mixed with ferozone, a chemical of no fixed composition, but varied to suit the sewage under treatment. It then passes into the purification tanks, where the solid matter, coagulated by the action of the ferozone, quickly subsides as sludge, and the clarified sewage is then admitted on to the polarite filters, from which it emerges in a bright, clear, colourless condition and free from objectionable smell.

The degree of purity is very high, showing as much as 88 per cent. reduction of albuminoid ammonia. The effect of this simple and rapid process created much surprise and interest. To demonstrate how efficacious the treatment was, several gentlemen tasted the bright and colourless water. The Corporation authorities had, it should be stated, tried the system experimentally nearly two years ago, and had placed gold and silver fish in the effluent, which are still to be seen. Some were taken out and again placed in the effluent now issuing from the polarite filters. The sludge is pressed and reduced to clinker in the destructor. The pressing machinery was supplied by Messrs. Goddard, Massey & Warner, of Nottingham. The system of purification adopted is the well-known polarite and ferozone one of the International Water and Sewage Purification Company. Messrs. Radcliffe & Co., of Huddersfield, were the contractors, and Mr. Clayton the resident and assistant engineer under whose superintendence the whole of the work has been carried out.

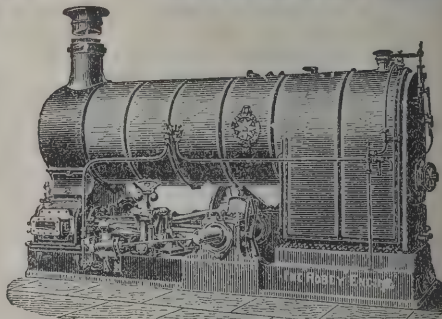
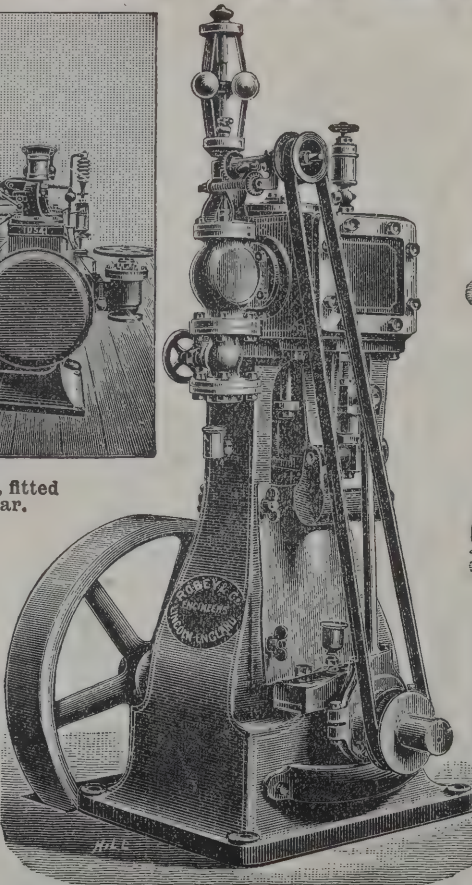
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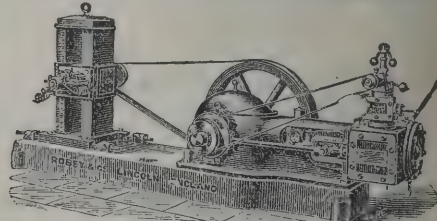
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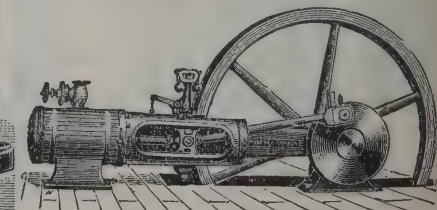
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GLOBE WORKS, LINCOLN.

HOLBORN AND STRAND IMPROVEMENT SCHEME.

MR. W. ROBINSON has just published in concise and consecutive form his recommendations of how this important work should be carried out. He also illustrates his short essay with various plans. The following extract will, however, be sufficient to explain Mr. Robinson's views:—

The simplest, least costly and in all ways the best way to get from Holborn to the Strand, and bring the fine square of Lincoln's Inn Fields and its stately trees as a picture into central London, is that shown in the plan. The effect would be good in all ways, as the square and many important buildings near, including the Law Courts, would come into the prospect. The fine open situation should certainly lead in the near future to buildings of the highest class being erected. The poor effects of Charing Cross Road and Shaftesbury Avenue point to the advantage of a street with a certainty of fine effects. The alternative line is truer and simpler, as will be seen by the plan, the same ends being attained as in that of the County Council plan, but by simpler means and far less costly.

Moreover, an improvement almost as much needed as the street from Holborn to the Strand would be effected at the same time, that is, the making visible of Lincoln's Inn Fields itself. This great square, which, with its surroundings, might give the finest effects possible in central London, is now almost inaccessible. In Paris or Vienna such an opportunity for improvement would be seized at once. I do not remember any square in either of these cities with such advantages; yet its rat-hole approaches from Holborn are so narrow that one can reach from wall to wall in passing.

The only "objection" I have heard mentioned to this way through the Fields is the puerile one that it would interfere with the quiet of the square, as if a vital improvement of the highest value to the square and neighbourhood should be barred for such a reason. A claim to exemption from traffic, denied to the houses in Pall Mall, Piccadilly, the Rue de Rivoli, and all the finest streets of the world, is not in any way reasonable. Moreover, only the west side of the square would be passed by.

The greatest gain of all is the question of cost. The property necessary to remove to open the line is far less in area and far less in value—probably nearly one-half; while the value of the reimbursement through the rebuilding around would be greater than in the proposed less interesting line of the County

Council. The perfectly simple line of the Lincoln's Inn Fields street would, by widening the Strand up to Catherine Street, do the work of the lower spur street of the Council plan and the work of the great street as well.

Views of the Law Courts and other important buildings near could easily be got without sacrificing the more valuable frontages. A most important gain is getting rid of the ugly protuberance in Holborn; the large angular space would form a useful space in Holborn, and be a much needed aid to traffic at the junction of the new street and Holborn.

The question of time is also worth considering, as in the eastern line the ground is clear, not only in the important section of the Fields, but near the Strand, where large spaces have lately been cleared. Between the Square and Holborn there are but very few buildings, so that a valuable gain of time would result, and the public might very soon get relief in this—a want for many years past.

The Council should waste no more time in trying to find some more equitable mode of taxation than now exists, but get to work on this very urgent improvement at once, which it is clear can be carried out at a less cost by a better line of street, and so remedy promptly and effectively what has been for many years a great inconvenience to the public.

As to cost, I put that question before Mr. Spencer Chadwick, of Parliament Street, who well knows the value of property in the district, and he replied "At least one-third less than in the proposed line of the County Council." He has surveyed the ground for me and set out this plan, and wholly agrees with me that the eastern line is by far the best line.

Apart from beauty of line, simplicity and economy, there are other advantages in the Lincoln's Inn Fields line which are important, the first being in avoiding displacement. It will be clear to any one who looks at the County Council's plan that it can only be carried into effect with immense loss in displacement of occupiers of whom Parliament compels the rehousing, and this much complicates the scheme.

Most of the ground in the Lincoln's Inn Fields plan being clear, the displacement difficulty is got over. Another point of advantage is in the relation between the Lincoln's Inn line and the larger streets and roads going north. It could not be better; also the southern connection with the river and Strand streets, and any bridge that may be required there in future, is also simple and direct.

It will be clear to any one who carefully examines the site that in it we have an opportunity of opening up views and

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effects worthy of the best parts of London, Paris or Vienna. But the approaches to the Fields are so ridiculous that people are not led to think of the noble chance that is wasted there; the narrow streets and passages which have to be faced to get to the Law Courts are suggestive of anything but the beauty of the site. Yet from the upper storeys of the houses on the west side of Lincoln's Inn Fields there is not merely a good view, but a picture the like of which neither Florence nor Paris could show.

It is surely our first duty to bring as much of this beauty as we may into the common possession, especially when we may do it so easily and promptly, and at the same time and by the same means add so much to the public convenience and to the health and airiness of the neighbourhood.

READING WATERWORKS EXTENSIONS.

THE Corporation and others lately visited the recently extended waterworks at Fobney. In the new engine-house two triple expansion Worthington pumping-engines have been erected in addition to the turbines hitherto in use. The Corporation inspected the intakes from the river Kennett, the polarite purifying chambers, and finally Mr. Walker's patent sand-washing appliances. With the new engines and polarite filters a water supply of over four million gallons a day can be guaranteed to the town. The polarite chambers are eight in number, each having an average thickness of $3\frac{1}{2}$ feet of material; four of these polarite beds or chambers were started in December 1892.

The water from the river intakes passes through a chamber filled with coke, to keep back leaves, grasses and other floating substances; it then flows vertically through chambers filled with polarite, a production of the International Company of Westminster—a material selected for filtration purposes, after an exhaustive inquiry into the various systems of filtration at home and abroad, on account of its simplicity of application and its efficiency as a natural filtrant; it removes all discolouration and contamination of the water by organic matter. The water came from the polarite chambers beautifully clear, and Reading claims to be the first town to adopt the system of working the water through polarite without a fall—a feature of great importance at works such as those at Reading, where the position does not admit of any fall, because the authorities desire to use their existing sand filters after the water has been oxidised in the polarite chambers.

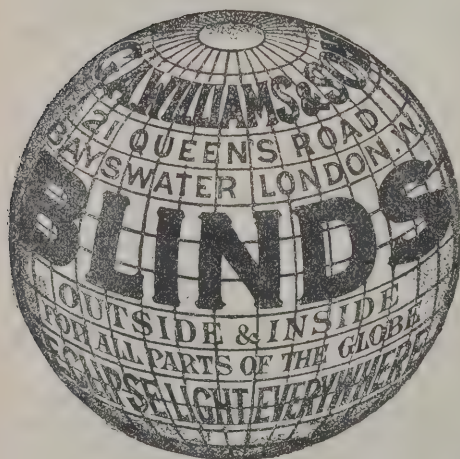
The International Company, the sole makers of polarite,

however, recommend that where practicable the river water should first be strained or clarified by percolation, and then passed through polarite to oxidise any organic impurities and colouring matter in solution.

One of the most useful additions to the new works is the patent sand-washing apparatus, the invention of the waterworks engineer; it consists of a battery of cone-like receivers, each connected by a flexible pipe with a small Worthington pump. By the use of these cone washers an enormous saving in water and labour is effected.

SPONTANEOUS COMBUSTION OF COAL.

At the meeting of the South Staffordshire and East Worcestershire Institute of Mining Engineers, held at the Mason College, Birmingham, under the presidency of Mr. W. B. Scott, chief inspector of mines, Mr. H. W. Hughes read a paper on "The Spontaneous Combustion of Coal," which, he said, was generally attributed to decomposition of iron pyrites, to pressure and to the oxidation of the organic constituents. He said that he had come to the conclusion that iron pyrites played a very unimportant part in the spontaneous combustion of coal, so far as direct action was concerned, but that it might materially assist by disintegrating the coal and by producing a slight rise in temperature. When it existed in the form of bright brassy lumps and veins little danger was to be apprehended, but the maximum effect was exerted when it occurred in the form of a dark amorphous powder finely disseminated through the coal. He also argued that coal never fired in the solid, and said that if combustion commenced in a large pillar, that pillar would be found to be fissured. Pressure on pillars greatly increased the danger of spontaneous combustion, but it was doubtful whether such action alone would start a fire. He then endeavoured to show that oxidation of the organic constituents of the coal was the main cause of underground fires, and stated that the coals most liable to spontaneous combustion were the highly-oxygenised semi-bituminous varieties, containing a large proportion of moisture. Discussing the prevention of such fires, he gave it as his opinion that the only method was to circulate as large a current of air as possible through the workings, to carefully remove all fine coal from the mine, to exclude as completely as possible all air from the gob and from heaps of shale, &c. in pillar workings, and in long wall workings to stow the gob carefully and completely, keeping the pack walls continuous.



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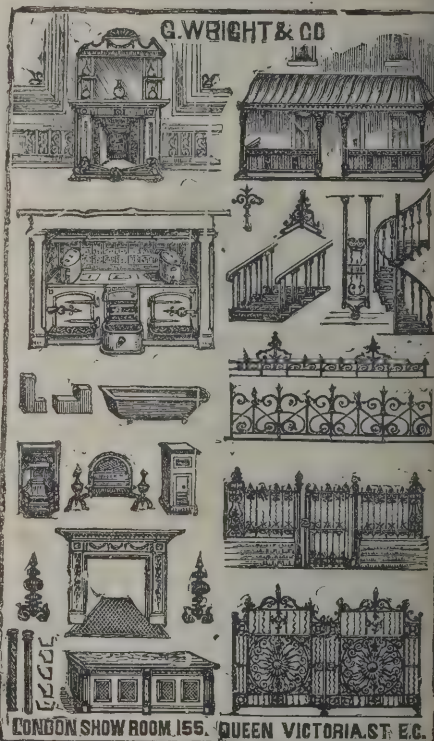
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CHICAGO BUILDINGS.

IN a letter to the *Daily News* the special correspondent asks, How far does Chicago answer to the claim that it is a phenomenal city—a metropolis more representative of the United States than either New York or Boston? Where the tall writing must, he says, be discounted is where it must needs make Chicago beautiful. Some day it may be so, but at present it should stop at its rapid progress and colossal prosperity. There are many fine edifices architecturally, no doubt, but for the most part the blocks of the skyscraper order, whose wonders are proclaimed with pride, would not satisfy an æsthete. Some of these buildings of anything between thirteen and twenty storeys are too like a cotton factory, and others which have had money lavished upon exterior ornament have it so high in air that your neck is in danger when you try to study it. The straight lines of streets due north and south or east and west are on a simple and practical plan, but they offer too much uniformity of buildings. A skyscraper may be a triumph of architecture in its façade, but if it rears its head a hundred feet above its neighbours, and presents end views of plain brick, naked and not ashamed, it becomes an eyesore. There are many such, and a few also like the Auditorium block, palatial in its finished harmony. Though you may get satiated with these monster buildings, you cannot forget them. They dominate everything. Of the many things in Chicago which are “the finest in the world” is the Masonic Temple, an affair of twenty storeys, total height 260 feet. Like the Women’s Temple, it is mainly let out in shops and offices, and there are 500 such, paying rents that produce a total of wealth that ought to satisfy even an American millionaire. The details of the architecture, like the general design, are of the highest type. The red granite, grey brick and terra-cotta employed in the building combine prettily, but of what avail are those Roman arches up at the tenth storey, or the recessed bays just below? The mysteries of masonry are practised on these floors, and the general court of the building below is walled with coloured marbles, while marbles, onyx and old oak woodwork are freely used on each storey. The entire interior is heated (overheated, alas!) with steam, and fourteen elevators and two goods lifts are always at work. There is another building with 600 offices, all let to tenants at high rents, and there are dozens of others in Chicago not much behind them in magnitude and appointments. Some day when there are whole streets of such mammoth buildings, Chicago

will be one of the wonders of the world to an even greater extent than it now is. There are dry goods and miscellaneous stores, also “the largest in the world.” We have some pretty big business houses in London, but these successive storeys of square lofty bazaars outdo them in size as much as the World’s Fair outdoes the best exhibition ever held. The public buildings are almost without exception worthy of a city that is fairly entitled to metropolitan rank. Away from the heart of the business world you begin to find the dwelling-houses of the inhabitants—such of them at least who do not live at hotels and boarding-houses. In the outlying suburbs, where the working-classes live, they may dwindle, after some three miles, into mere shanties of weather-board, interspersed with shops that are not better than booths. In other directions—north and west—you have the domestic architecture of the rich, and very good, if mixed, it is. Here, again, are adaptations of all known styles, equal to original designs. Turrets, towers, gables, dormer windows, balconies and verandahs meet the eye everywhere, and fine effects in rough granite are frequent. The stone of the country is better than its wine, and each state seems to have its specialty in material for the builder.

IS A HOARDING A BUILDING?

A CASE came before Mr. Justice Kekewich in the Chancery Division of the High Court of Justice, as to whether a hoarding was a “building” within the meaning of a covenant against erecting any building. By deed dated February 25, 1869, William Foale, conveyed two plots of ground in Kingston-upon-Hull, forming part of a residential estate, to the defendant, Fraser, in fee, Fraser covenanting with Foale, his heirs and assigns, to observe certain covenants entered into by Foale when he purchased the property, and therein stated as follows:—“That any building which shall hereafter be erected upon the said piece or parcel of land secondly hereinbefore described fronting the Spring Bank aforesaid shall be at least 36 feet in height from the level of the said flagged footpath, and shall have a stuccoed or cemented front and a slated roof; and that any building which shall hereafter be erected on the said piece or parcel of land firstly hereinbefore described shall be at least 22 feet from the level of the said flagged footpath, and any buildings thereon which face the east shall have a stuccoed or cemented front, and any building facing the north shall be fronted with white stock bricks and have slated roofs, and such

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buildings respectively shall be used only as dwelling-houses, and that no tenements or other outbuildings shall be erected upon the said pieces or parcels of ground or any part thereof respectively to be occupied as tenements or as courts or squares or otherwise separately from the said front messuages or dwelling-houses." In June 1892 the defendants, the Hull and Grimsby Bill-posting and Advertising Company, Limited, under a license from the defendant Fraser, erected on this land an immense hoarding of a most substantial character, supported by struts and outposts and from 12 feet to 14 feet in height, and used it as an advertising station. The plaintiff, Foster, the devisee in trust and executor of Foale, who had purchased other residential property adjoining that conveyed to Fraser, alleged that the covenants were intended as a protection to the estate, and complained that this hoarding was an annoyance to himself and his tenants and had depreciated, and would depreciate, the value and amenity of his property and of the estate generally. He accordingly brought this action for alleged breach of the covenants and for an injunction. The action now came on for trial.

Mr. Renshaw, Q.C., and Mr. Maidlow appeared for the plaintiff, and Mr. J. G. Wood for the defendants.

Mr. Justice Kekewich, after holding that the plaintiff took as assignee of Foale, and as such was entitled to maintain the action, said that this was unquestionably a residential property, and the first question was whether this covenant was originally intended for the benefit of the property. Upon that he had not the slightest doubt. And upon the evidence it was clear that it was prejudicial to the property to have a hoarding covered with advertisements. It was one of those things which were not agreeable to residential property, and, in his opinion, the covenant was reasonable as a protection to residents in the neighbourhood. So far he was in the plaintiff's favour. Then the remaining question was, Was this hoarding a "building" within the meaning of this covenant? That was not at all an easy question to determine, and for this reason. The covenant was not expressed in language as full as one could wish, and no doubt the construction was rendered a little more difficult, as it did not show the protection which it was intended to effect. It was not stated what were the purposes for which the covenant was put in; it was put in without any introduction or explanation. The grantee might turn the land into a market garden or anything else. As long as he did not put up a building he might use it for any purpose whatever. There was no express covenant to build anything, but what the

covenant said was this:—"If you do build, the building shall be of a certain kind." Looking at the terms of the covenant, they were not applicable to a hoarding at all. The words did not point to anything of the kind, and accordingly his lordship held that such a hoarding as that in question was not a "building" within the covenant. The defence, therefore, succeeded, and there must be judgment for the defendants with costs.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

10496. Richard Sutcliffe Blackburn, for "Improvements in the method of and apparatus for operating steam or other valves, for fire or other alarms, and for suitable purposes."

10499. Ernest Arthur Scammell, for "Improvements in filters."

10516. Edwin Frankling Oakley and John Lewis Devonport, for "An improved method of and apparatus for extinguishing fires in buildings and other places."

10530. David John Russell Duncan, for "Improvements in wheels, pulleys and the like."

10542. James Collins and Harry Rae, for "Improvements in handles for locks, latches and the like."

10549. David Lawley, for "Improvement in sash-fasteners and the same, to be used for similar purposes."

10649. Joseph Hamilton, for "Improvements in concrete and artificial stone mantelpieces."

10693. Thomas Hobbs, for "Improvements in sheave or pulley blocks."

10695. John Lewis Dubois, for "Improvements in cocks for water, gas, steam or other fluids."

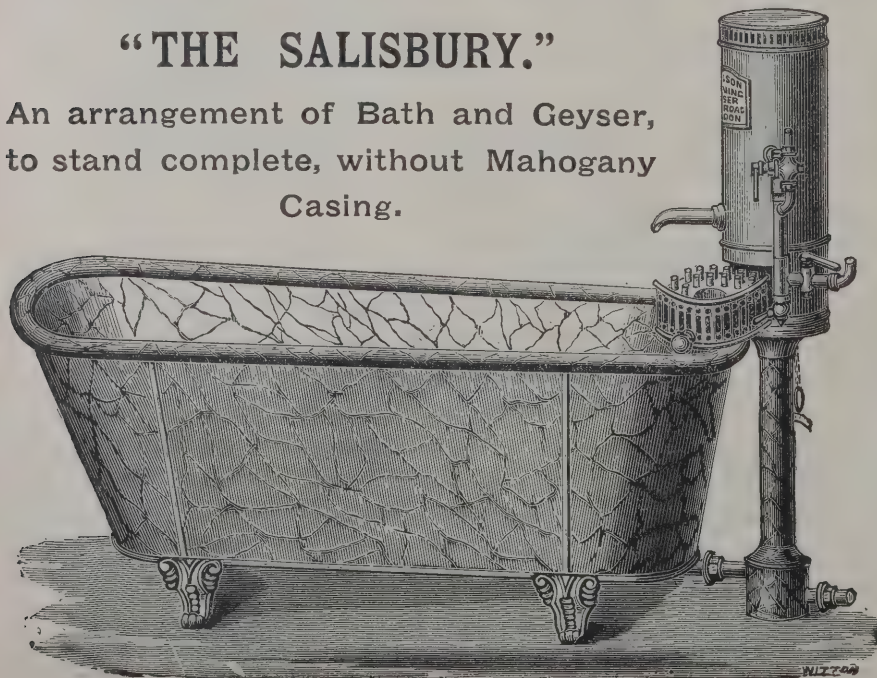
10717. Charles Meason, for "Improvements in brass or other fenders and fire-dogs."

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TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

COMPETITIONS OPEN.

MONMOUTH.—Aug. 1.—Premiums of 30 and 20 guineas are offered for schemes for Disposal of Sewage. Mr. T. R. Oakley, Town Clerk, Monmouth.

ROCHESTER.—June 26.—Designs are invited for the Sewerage of the Village of Borstal. Premiums of 25 Guineas and 10 Guineas. City Surveyor, Guildhall, Rochester.

ST. HELENS.—July 24.—Designs are invited for Public Library and Technical School. Premiums of 100l., 50l. and 25l. W. J. Jeeves, Town Hall, St. Helens.

SWANSEA.—Designs are invited for School Building. Premiums of 50 guineas and 10 guineas. Mr. A. W. Halden, School Board Offices, Dynevor Place, Swansea.

TOTTENHAM.—Aug. 1.—Designs are invited for Town Hall and Board Offices. Premiums of 75l., 50l. and 25l. Mr. J. E. Worth, 712 High Road, Tottenham, N.

WOLVERHAMPTON.—June 24.—Designs are invited for Laying-out Proposed East End Park. Premiums of 50l. and 25l. Also Designs for Laying-out Piece of Ground between Art Gallery and Birmingham and District Bank. Premium, 10l. Mr. Horatio Brevitt, Town Hall, Wolverhampton.

CONTRACTS OPEN.

ABERTILLERY.—June 26.—For Building Goods Shed and Offices. Mr. G. K. Mills, Secretary, Paddington Station.

ABINGDON.—July 8.—For Supplying and Fixing Two Cornish Boilers, Steam Radiators, Cooking Apparatus, &c. Mr. G. Winship, Borough Buildings, Abingdon.

ACCRINGTON.—June 26.—For Building Technical School. Mr. Henry Ross, Architect, Birch Street, Accrington.

ALDERSHOT.—June 26.—For Building Vergers' Quarters, &c. Lieutenant-Colonel S. Waller, Royal Engineer Office, South Aldershot.

ASHFORD.—June 30.—For Painting at District School. Mr. C. D. Hume, District School, Ashford, Middlesex.

AYLESBURY.—July 4.—For Building Brick and Iron Bridge over Canal. Mr. R. J. Thomas, Exchange Buildings, Aylesbury.

BIRMINGHAM.—July 4.—For Constructing 5,000 yards of Railway. Mr. J. Mansergh, 5 Victoria Street, Westminster.

BOURNEMOUTH.—June 26.—For New Buildings, &c., for Town Council. Mr. F. W. Lacey, Municipal Offices, Bournemouth.

BOVEY TRACEY.—June 23.—For Building Farmhouse. Mr. S. Segar, Architect, Union Street, Newton Abbot.

BRIGEND.—June 30.—For Construction of Retort-house, Retort-arches, Chimney-stack, Coal-store, &c. Mr. J. H. Dyer, Secretary, Gas and Water Company, Bridgend.

BRIGHTON.—June 30.—For Supplying Portland Cement. Mr. Francis J. C. May, Town Hall, Brighton.

BROMLEY.—June 27.—For Supplying Road Materials. Mr. F. H. Norman, Local Board Offices, Bromley, Kent.

CAMBRIDGE.—June 24.—For Adding Wing to Asylum. Mr. T. Musgrave Francis, Clerk to the Visitors, Cambridge.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CLAY CROSS.—June 28.—For Constructing Reservoir. Mr. W. H. Radford, Angel Row, Nottingham.

COLCHESTER.—June 24.—For Construction of Engine and Boiler Houses, Chimney Shaft, &c., Additions to Waterworks Superintendent's House, &c. Mr. C. E. Bland, 12 Crouch Street, Colchester.

CRAWLEY.—June 24.—For Alterations and Additions to Crawley Lodge. Mr. W. Buck, 60 West Street, Horsham.

DONCASTER.—June 26.—For Restoring Premises after Fire. Messrs. Burtenshaw & Tovey, Solicitors, Doncaster.

FALMOUTH.—June 24.—For Building Hospital. Mr. R. N. Rogers, 7 Arwenack Street, Falmouth.

GLASGOW.—July 1.—For Supplying Cast-iron Pipes, Hydraulic Valves and Fittings, Bolts, Nuts, &c. Messrs. Ellington & Woodall, Palace Chambers, Bridge Street, Westminster.

GREAT WESTERN RAILWAY.—June 27.—For Building Passenger Stations, Goods Sheds, Retaining Wall, Widening and Constructing Bridges, &c. Mr. S. K. Mills, Paddington Station, W.

GREENWICH.—June 28.—For Making-up Roads, Paving Footways, &c. Mr. J. Spencer, 141 Greenwich Road, S.E.

HENDON.—June 26.—For Constructing Pipe Sewers. Mr. D. R. Soames, the Union Offices, Edgware.

IPSWICH.—June 27.—For Constructing Iron Fences. Mr. A. Sandbach, Cornhill Chambers, Thoroughfare, Ipswich.

ISLINGTON.—June 26.—For Repairing and Painting and Providing Flushing Apparatus at Public Urinals. Mr. J. P. Barber, Vestry Hall, Upper Street, N.

JARROW.—July 4.—For Repairing Boundary Walls, &c. Mr. J. H. Morton, Architect, King Street, South Shields.

JERSEY.—June 30.—For Widening North Pier of Harbour. Mr. E. Berteau, Royal Square, Jersey.

LEICESTER.—June 24.—For Two Triple Expansion Pumping Engines. Mr. J. B. Everard, Engineer, 6 Millstone Lane, Leicester.

LEWISHAM.—June 27.—For Supplying Road Materials. Mr. E. Wright, Board of Works Offices, Catford.

LONDON.—July 7.—For Cleaning and Painting Houses. Mr. J. Williams, Midland Railway Co., Derby.

MANCHESTER.—July 1.—For Constructing Gasholder. Mr. C. Nickson, Town Hall, Manchester.

MELTHAM.—June 28.—For Laying Fireproof Floors. Messrs. J. Kirk & Sons, Architects, Huddersfield.

MITCHAM.—July 4.—For Building Bath-room at Holborn Union Schools. Mr. H. Saxon Snell, Architect, 22 Southampton Buildings, W.C.

PADDINGTON.—June 27.—For Building Kitchen and Stores, Painting, &c. Mr. H. F. Aveling, Guardians' Offices, 289 Harrow Road, W.

RAMSEY.—July 6.—For Building Schools, Boundary Walls, &c. Mr. J. W. Start, Architect, Cups Chambers, High Street, Colchester.

ROCHESTER.—June 29.—For Building Retort House for Rochester Gaslight Co. Mr. W. Syms, 58 High Street, Rochester.

ROUNDHAY.—June 23.—For Building Entrance Lodge. Messrs. Swale & Mitchell, 98 Albion Street, Leeds.

RUDGWICK.—June 23.—For Building Girder Bridge over River Arun. Mr. W. Dengate, 58 Park Street, Horsham.

SALFORD.—July 6.—For Erecting Engine and Coal Breaker, Elevator, Conveyer, &c. Mr. S. Brown, Town Hall, Salford.

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SOUTHWARK.—July 4.—For Supplying Guernsey Granite Cubes. Mr. A. M. Hiscok, Vestry Hall, Borough Road, S.E.

SPURN POINT.—June 29.—For Building Lighthouse, &c. Mr. E. Clark, 47 Strand, W.C.

STONEV STANTON.—June 24.—For Supplying and Laying Cast-iron Socket Mains, Sluice and Air Valves, Wall Fountains, "Torrent" Filter, &c. Mr. S. Preston, Church Street, Hinckley.

STREATHAM.—July 3.—For Constructing Pipe Sewer. Mr. H. G. Hills, Board of Works Office, East Hill, Wandsworth.

SUNDERLAND.—July 11.—For Building Retort House, Coal Sheds, Purifying House, &c. Messrs. T. & C. Hawksley, 30 Great George Street, Westminster, S.W.

TORQUAY.—June 27.—For Building Ornamental Iron and Glass Shelters and Band Stand. Mr. H. A. Garrett, Town Hall, Torquay.

TREDEGAR.—June 26.—For Additions and Alterations to Schools. Mr. C. Dauncey, School Board Offices, Tredegar.

WALTHAMSTOW.—June 27.—For Repairing Schools. Mr. W. A. Longmore, Architect, 7 Great Alie Street, Whitechapel, E.

WANSTEAD.—June 30.—For Repairing Schools. Mr. J. T. Brassey, 70 Bishopsgate Street Within, E.C.

WESTMILL.—July 3.—For Rebuilding Bridge. Mr. Urban A. Smith, 28 Victoria Street, Westminster, S.W.

WORCESTER.—June 27.—For Building Electric Lighting Station. Mr. S. G. Purchas, Guildhall, Worcester.

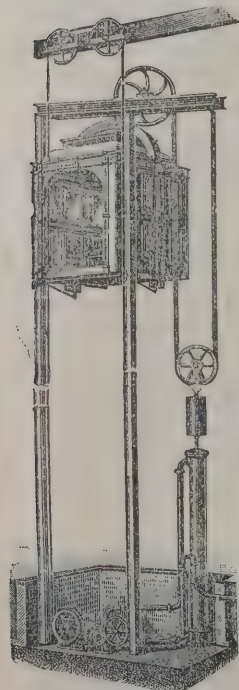
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J. Whyte, Aberdeen, glazier	210	0	0
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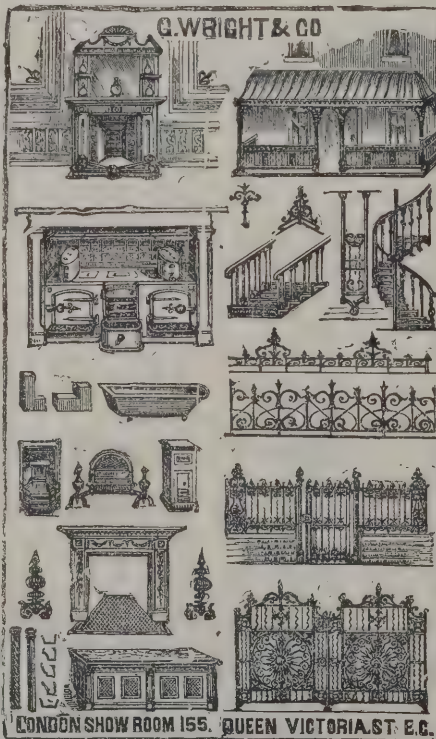
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Webster	3,676	0	0
Flint	3,674	0	0
Nash	3,648	0	0
Loosley	3,643	0	0
Gibson	3,633	10	0
Hunt	2,996	0	0
Mead	2,897	10	0
Darlington	2,800	0	0

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For Enlargement of Lorne House Stationery and Printing Establishment, Bangor, for Messrs. Jarvis & Foster. Mr. R. DAVIES, Architect, Bangor.

R. & J. Williams, Upper Bangor	£535	0	0
Watkin Jones, Bangor	294	0	0
Evan Williams, Garth, Bangor	340	0	0
JONES & WILLIAMS, Bangor (accepted)	315	10	0

BOURNEMOUTH.

For Roads and Drainage Works, Westbourne Park. Messrs. H. E. HAWKER & MITCHELL, Architects, Bournemouth.

Cooke & Co, Battersea	£2,500	0	0
Reekes, Lymington	2,200	0	0
Turner & Co., Bury St. Edmunds	2,059	0	0
F. Budden, Poole	2,024	0	0
C. Stickland, Bournemouth	1,746	0	0
W. Hoare, Bournemouth	1,460	0	0
SAUNDERS & CO., Bournemouth (accepted)	1,378	0	0

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For Building Infectious Diseases Hospital at the Workhouse, Chesterton. Mr. W. M. FAWCETT, M.A., Architect, Cambridge.

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For Erection of a Pair of Cottages at Birtley, for the Hon. H. Cubitt, M.P. Messrs. W. & G. SHEARBURN, Architects, Effingham House, Arundel Street, W.C. and Dorking.
W. STANTON, Cranleigh (accepted) . . . £450 0 0

CHELTENHAM.

For Building Chapel at Cheltenham College. Mr. H. A. PROTHERO (Middleton, Prothero & Phillott), Architect, Cheltenham.

H. Willcock & Co., Wolverhampton . . .	£13,067	1	9
Stephens, Bastow & Co., Bristol . . .	11,138	0	0
A. Estcourt & Son, Gloucester . . .	10,441	0	0
A. C. & S. Billings, Cheltenham . . .	10,356	0	0
J. W. Bunning & Son, London . . .	10,290	6	11
C. W. King, Cheltenham . . .	10,200	17	11
T. Collins, Cheltenham . . .	10,147	17	6

COVENTRY.

For Engines, Boilers, Pumps and Machinery, at the Whitley Pumping Station, Coventry. Mr. HAWKESLEY, C.E.

Hunter & English, London . . .	£11,748	0	0	£295	0	0
B. Goodfellow, Hyde . . .	11,500	0	0	450	0	0
Bever & Dorling, Dewsbury . . .	10,450	0	0	188	0	0
Hathorn Davey & Co., Westminster . . .	9,600	0	0	400	0	0
James Watt & Co., London . . .	8,850	0	0	140	0	0
R. Moreland & Son, London* . . .	8,000	0	0	220	0	0

* Accepted at £8,000.

GREENOCK.

For Reconstruction of 1½ mile of Double-line Tramway, including the Supply of the necessary Steel Rails, Fish-plates, Setts, &c., for the Greenock Police Board. Mr. ALEX. J. TURNBULL, Burgh Engineer.

R. Finnegan, Northampton . . .	£7,718	4	0
W. Winnard, Wigan . . .	7,302	11	9
C. Brand & Son, Glasgow . . .	6,650	0	0
A. & J. Faill, Glasgow . . .	6,368	10	1
J. Young & Sons, Edinburgh . . .	6,300	0	0
W. Lang, Gourrock . . .	5,982	4	9
J. Paton & Co., Glasgow . . .	5,765	19	11
R. Tilburn, Glasgow . . .	5,500	0	0
DICK, KERR & Co., Limited, London (accepted) . . .	5,448	4	9
Burgh Engineer's estimate . . .	6,250	0	0

DARTFORD.

For Additions to the Laundry at the Gore Farm Hospital near Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

E. Proctor . . .	£350	0	0
W. Johnson & Co.	315	0	0
J. ELLINGHAM, Bexley Heath (accepted) . . .	240	0	0

HANLEY.

For Alterations to Business Premises, 3 Piccadilly, Hanley, for Mr. Edward Baddeley. Mr. LARNER SUGDEN, Architect, Leek. Quantities by Architect.

Tyldesley, Hanley	£1,303	10	0
Inskip, Longton	1,120	0	9
Godwin, Hanley	1,119	9	0
Cornes, Hanley	1,110	0	0
Bromage, Longton	1,062	0	0
LINDOP & WALLEY, Porthill (accepted) . . .	1,005	16	10

HOO ST. WERBURGH.

For Enlargement of Board Schools, Hoo St. Werburgh. Mr. JOHN DRAKE, Architect, Rochester. Quantities not supplied.

Turner, Hoo	£223	17	0
West Bros., Strood	150	0	0
Price & Ellen, Hoo	149	15	6
GATES, Frindsbury (accepted)	122	0	0

KINSON.

For Additions to Board School, Heatherland Village, Kinson. Messrs. LAWSON & DONKIN, Architects. Quantities by Architects.

Jenkins & Sons, Bournemouth	£1,250	0	0
George & Harding, Bournemouth	1,238	0	0
McWilliam & Son, Bournemouth	1,145	0	0
Entwistle & Cox, Bournemouth	1,120	0	0
F. Hoare & Son, Bournemouth	1,107	0	0
Huxtable, Bournemouth	995	0	0
W. H. C. Curtis, Poole	989	0	0
G. BAKER, Wimborne (accepted)	925	0	0

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D. Thoms, Kendal, mason	£4717	3	8
J. Shepherd, slater	350	0	0
Workington Bridge and Boiler Company, roof principals	259	0	0

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For External Repairs and Painting, &c., to House, Snaresbrook, N.E. Mr. HERBERT RICHES, Architect, 3 Crooked Lane, E.C.

Maple	£125	0	0
Mundy	94	0	0
Osborn & Sons	91	0	0

For Casual Wards, Great Guildford Street, S.E., for the Guardians of the St. Saviour's Union. Messrs. HENRY JARVIS & SON, Architects, 29 Trinity Square, Southwark, S.E.

Chessum & Sons, Haggerston	£11,140	0	0
C. Ansell, Lambeth	10,989	0	0
J. Tyerman, Walworth	10,700	0	0
J. Marsland, Walworth	10,685	0	0
Lorden & Sons, Upper Tooting	10,371	0	0
Allen & Sons, Kilburn	10,350	0	0
F. J. Coxhead, Leytonstone	10,295	0	0
Balaam Bros., Old Kent Road	10,237	0	0
G. Parker, Peckham	10,185	0	0
Lawrance & Sons, City Road	10,101	0	0
H. L. Holloway, Deptford	10,100	0	0
Smith & Son, Norwood	9,889	0	0
J. O. Richardson, Peckham	9,739	0	0
Kirk & Randall, Woolwich	9,383	0	0

For Rebuilding Casual Ward and Local House, &c., Thavies Inn, E.C., for the Guardians of the City of London Union. Mr. F. HAMMOND, F.R.I.B.A., Architect, 1 Circus Place, London Wall, E.C.

Ashby & Horner	£17,980	0	0
Harrison & Spooner	17,945	0	0
Patman & Fotheringham	17,770	0	0
Colls & Son	17,530	0	0
Woodward	17,490	0	0
Ashby Bros.	17,431	0	0
W. & H. Castle	16,711	0	0
W. G. Larke & Son	16,284	0	0

LONDON—continued.

For Rebuilding No. 15 Garlick Hill, E.C., for Mr. Deputy Pimm. Professor BANISTER FLETCHER, Architect, 29 New Bridge Street, Ludgate, E.C.

H. J. Williams (<i>too late</i>)	£2,634	0	0
E. A. Roome	2,626	0	0
J. Greenwood	2,571	0	0
C. R. BLYTON (<i>accepted</i>)	2,491	0	0

For Structural Alterations to Shops, Nos. 4 and 6 Exhibition Road, South Kensington, S.W., for Mr. William Follett. Messrs. POOLEY & FOLLETT, Architects, 21 John Street, Adelphi, W.C.

G. P. Kent, Chelsea	£115	0	0
SCHARIEN & Co., Chelsea (<i>accepted</i>)	112	0	0

For Alterations and Additions to the Golden Lion Public-house, W.C. Mr. C. H. FLACK, Architect. Quantities by Mr. H. R. MESSENGE.

Howell & Williams	£1,658	0	0
Voller	1,649	0	0
Evans	1,648	0	0
Patman & Fotheringham	1,510	0	0
Eddie	1,498	0	0
Worsley & Co.	1,497	0	0
Edwards & Medway	1,447	0	0
J. Allen & Sons	1,275	0	0

For Erection of Nurses' Block at the St. Pancras Infirmary, Highgate, for the Guardians of the Poor of St. Pancras. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities by Messrs. CORDEROY & SELBY and Mr. W. T. FARTHING.

Wall & Co.	£7,845	0	0
Lascelles & Co.	6,635	0	0
Leslie & Co.	6,447	0	0
Turner, Limited	6,440	0	0
W. Johnson & Co.	6,396	0	0
Shillitoe & Son	6,350	0	0
C. MISKIN, St. Albans (<i>accepted</i>)	6,160	0	0

MORRISTON.

For Building Baptist Chapel at Cwmrhdycewri, Morriston, Mr. THOMAS JONES, C.C., Architect, Clydach, Swansea.

Watkins, Morriston	£1,274	0	0
Hughes & William, Morriston	1,237	10	0
Lewis & Davies, Clydach, Swansea	1,188	0	0

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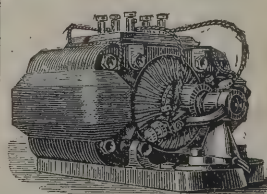
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For Building Beer Stores, Stabling for Twenty Horses, &c., at Victoria Brewery, Westmoreland Lane, Newcastle-on-Tyne, for Mr. R. Newton. Messrs. DAVIDSON & BENDLE, Architects, 33 Grainger Street West.

T. Hutchinson, Newcastle	£2,950	12	0
J. L. Miller, Tynemouth	2,762	7	5
E. Weatherley, Newcastle	2,732	7	7
T. Hunter, Washington	2,653	18	0
R. Mitchison & Co., Newcastle	2,595	11	0
H. Brown & Co., Newcastle	2,530	11	0
Haswell & Waugh, Gateshead	2,517	4	0
R. Veitch, Newcastle	2,505	16	6
J. & W. Lowrey, Newcastle	2,498	0	0
T. H. Forsyth, Newcastle	2,480	14	0
J. Smart, Newcastle	2,460	9	9
Stephenson & Spoors, Gateshead	2,450	0	0
E. & H. George, Newcastle	2,425	10	0
Middlemin Bros., Newcastle	2,401	14	6
J. LUNN, Newcastle (accepted)	2,351	11	0

PARKSTONE.

For Building Congregational Church, Parkstone, Dorset. Messrs. LAWSON & DONKIN, Architects, Bournemouth. Quantities by the Architects.

Entwisle & Cox, Bournemouth	£4,650	0	0
J. W. Lucas, Bournemouth	4,498	0	0
Abley & Cowley, Salisbury	4,480	0	0
F. Hoare & Sons, Bournemouth	4,428	0	0
T. H. Kingerlee, Oxford	4,394	0	0
George & Harding, Bournemouth	4,364	0	0
Hayward & Co., Bournemouth	4,355	0	0
Chinchen & Co., Parkstone	4,260	0	0
G. C. Rigler, Poole	4,250	0	0
W. H. C. CURTIS *	3,994	0	0

* Accepted subject to modification.

STOKE-ON-TRENT.

For Alterations to the Central Schools, for the Stoke Church School Board. Messrs. R. SCRIVENER & SONS, Architects, Hanley.

G. Ellis, Hanley	£1,013	0	0
J. Breeze, Stoke	900	0	0
H. S. Embsey, Fenton	867	0	0
T. R. JOXALL, Stoke (accepted)	840	0	0
T. Godwin, Hanley	799	0	0

SHEFFIELD.

For Building Schools and Caretaker's House, Cambridge Street, Sheffield. Mr. WILLIAM J. TAYLOR, Architect, 33 Bank Street, Sheffield.

	Schools.	Caretaker's House.
J. T. Duke, Sheffield	£2,585	0 0
Hy. Frickingham, Sheffield	2,475	0 0
C. Skelton, Sheffield	2,238	0 0
John Chambers & Sons, Sheffield	2,080	0 0
D. O'Neill & Son, Sheffield	2,078	0 0
Poysey & Crossley, Sheffield	2,042	0 0
P. Saul & Son, Sheffield	2,032	0 0
C. FANN, Sheffield (accepted)	1,991	0 0

SOUTHAMPTON.

For Extension of Town Quay, Southampton, Building Warehouses, &c. Mr. E. COOPER POOLE, A.M.Inst.C.E., Engineer. Quantities by the Engineer.

		Without Loft.
Reed, Blight & Co., London	£31,625	0 0
Tees Side Iron Co., Middlesbrough	29,500	0 0
Thorne, London	27,835	0 0
Geo. Double, London	27,798	0 0
Kirk & Randall, London	26,500	0 0
Geo. Napier & Co., Southampton	24,675	0 0
Roe & Grace, Southampton	24,442	0 0
H. J. Sanders, Northam	23,484	0 0

For Building Stable, Bargate Street, Southampton. Mr. W. B. G. BENNETT, Borough Surveyor. Quantities by Mr. H. J. WESTON.

F. Osman, Southampton	£150	0 0
Crook & Son, Southampton	149	0 0
W. Harvey, St. Denys	144	0 0
Roe & Grace, Southampton	140	10 0
G. H. Woodford, Southampton	140	0 0
Rowland & Son, Southampton	135	0 0
Borough Surveyor's estimate	135	0 0

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SEAFORTH.

For Building Sunday-school and Boundary Wall at Seaforth.		
Mr. R. CURWEN, Architect, 168 Palmerston Buildings, Old Broad Street.		
R. Costain, Crosby	£2,585	12 6
W. Thornton & Sons, Liverpool	2,428	0 0
J. Bates, Seaforth	2,362	0 0
G. Woods & Son, Bootle	2,361	0 0
G. L. Desoer, Liverpool	2,278	0 0
R. C. ESKRIGGE, Seaforth (accepted)	2,254	10 0
E. Johnson, Seaforth	2,214	0 0
S. Webster, Bootle (too late)	2,290	0 0
G. Johnson, Seaforth (too late)	2,223	0 6

TRING.

For Additions to St. Leonard's National School, near Tring.		
Mr. WM. HUCKVALE, Architect, Tring.		
J. Honour & Son, Tring	£698	10 0
E. Smith & Son, Tring	682	0 0
H. Fincher, Tring	659	0 0
A. Turner, Buckland Common, near Tring	486	10 3

WILLESDEN.

For the Erection of a Free Library, Willesden Green, for the Willesden Public Libraries Committee. Messrs. NEWMAN & NEWMAN, Architects, 31 Tooley Street, S.E. Quantities by Messrs. NORTECROFT, SON & NEIGHBOUR, 57 Charing Cross.

Yerbury	£2,580	0 0
Nightingale	2,428	0 0
Bowyer	2,423	0 0
Godfrey	2,377	0 0
Godwin	2,350	0 0
Godson	2,260	0 0
Houghton & Son	2,210	0 0
Cowley & Drake	2,200	0 0
Dainton	2,195	0 0
G. Neale	2,195	0 0
Turner	2,184	0 0
Lorden	2,157	0 0
SABEY & SON (accepted)	1,991	0 0

WIMBLEDON.

For Additions to Local Board Offices, Wimbledon.		
E. Winyett & Son, Wimbledon	£248	10 0
J. Milledge & Son, Wimbledon	244	0 0
J. Burges, Wimbledon	220	0 0
Parsons & Townsend, Wimbledon	176	10 0

WATFORD.

For Making-up of Market Street, Watford.		
W. Judge	£870	0 0
F. Bracey	779	0 0
F. Dupont	770	0 0
C. Brightman	739	0 0
A. T. CATTLEY, London (accepted)	688	0 0

WOOLWICH.

For Rebuilding 98 Powis Street, Woolwich, for Messrs. S. H. Cuff & Co. Mr. HENRY H. CHURCH, Architect. Quantities supplied by Mr. W. WHINCOP, 44 Norcott Road, Stoke Newington, N.		
Multon & Wallis	£1,849	0 0
Young & Lonsdale	1,700	0 0
Fredk. Tarrant	1,692	0 0
Chessom & Sons	1,679	0 0
Balaam Bros.	1,615	0 0
H. L. Holloway	1,600	0 0
Jas. Chapman	1,545	0 0

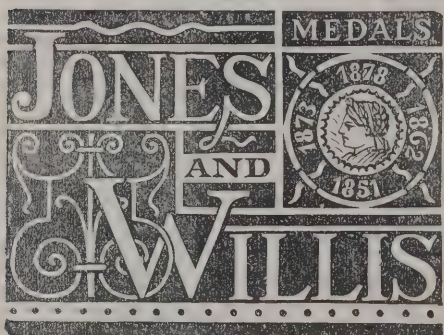
TRADE NOTES.

AT the meeting of the Leeds Corporate Buildings Committee, it was decided to invite five Leeds firms to send in tenders for the redecoration of the Borough and Crown Courts at the Town Hall.

AT the meeting of the Bilston Township Commissioners, Mr. L. B. Cole, chairman, presiding, a discussion took place with regard to the provision of an infectious hospital at a cost of 2,500*l*. Ultimately the matter was referred to the General Purposes Committee, who were instructed to advertise for tenders.

THE contract for the proposed new church of St. Peter's, Staines, to be built at the sole expense of Sir Edward Clarke, Q.C., has been placed in the hands of Messrs. Goddard & Sons, builders, of Farnham. The cost of the building, inclusive of heating and lighting, but exclusive of the two top stages of the tower, will be 6,500*l*. The architect is Mr. G. H. Fellows Pryne, F.R.I.B.A., of Westminster. A sketch of the interior of this church, with its large constructional rood screen, is exhibited in this year's Academy.

THE tender of Mr. James Julian, builder, of Truro, for the re-restoration of St. Stephen's Church, near Grampound Road, Cornwall, has been accepted. The re-restoration will be carried

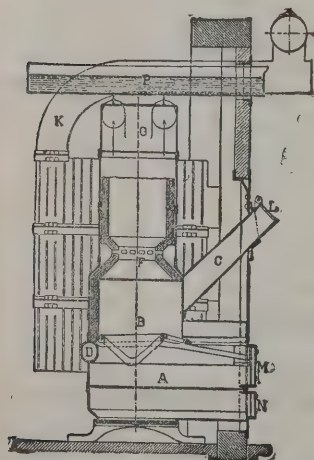


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out from designs and under the superintendence of Mr. G. H. Fellowes Prynne, Westminster, at a cost of about 1,100*l*.

WE notice that the Homacoustic Speaking Tube Company are popularising their system and meeting with deserving encouragement in installing their apparatus in some of the most prominent of our public buildings, some of the most recent works being the Press Association's new offices, the Institute of Chartered Accountants (the inauguration of which recently took place), the new premises of Pearson's Weekly, Limited, Henrietta Street, Covent Garden, Kelly & Co.'s (of directory fame) new building in Holborn, the Gresham Life Assurance offices in the Poultry, Cheapside, and many others. We understand that in the latter work over 3,000 feet of tubing has been employed in the installation, some of the tubes being considerably over 250 feet long. The system has given the utmost satisfaction to the officers and directors of the latter company, who, to show their appreciation, have added one more to the Homacoustic Co.'s long list of testimonials. The work was carried out under the supervision and direction of Mr. Creed, Finsbury Square. The system, which is rapidly displacing short-distance telephones, may be seen at the company's extensive show-rooms in actual efficient working at 22 Queen Street, Cheapside.

BUILDING AND BUILDERS.

THE Vestry of Islington have agreed to give 6,500*l*. towards rebuilding Highgate Archway. The total cost will be 27,000*l*., to which the Ecclesiastical Commissioners will give 1,000*l*.; the Middlesex County Council, 13,000*l*.; and the London County Council, 6,500*l*.

THE annual trip of the Glasgow Master Masons' Association has just taken place. Leaving by an early train for Melrose, the party drove to Abbotsford, thence to Dryburgh Abbey, returning to Melrose in the afternoon. The trade was well represented, and deputations were present from the Master Builders' Associations of Edinburgh and Dundee. The president of the Glasgow Institute of Architects and a representative from the Glasgow Institute of Measurers were also present. The party had lunch on arrival, and subsequently dined at the George and Abbotsford Hotel, Melrose.

THE large builders' premises of Messrs. William Cubitt & Sons, in the Gray's Inn Road, caught fire on Saturday, and were in great part destroyed.

At the meeting of the Mid Ross district committee, held at Dingwall, Messrs. Crouch & Hogg, engineers, Glasgow, submitted plans of proposed new bridges to be erected over the rivers Conon and Orrin, as the present wooden structures have become unsound. The designs submitted included steel girder and wooden bridges, the former to cost about 3,000*l*. for the Conon and 2,000*l*. for the Orrin. The wooden bridges were estimated to cost about a third of these figures respectively. It was agreed to adopt the steel structures, but final settlement of the matter will be delayed till October. In course of discussion it was intimated that the larger bridge over the Conon had been notified as dangerous during the past twenty years.

SUBJECT to certain conditions formulated by Sir Thomas Storey, the building known as the Storey Institute, Lancaster, is to be handed over to the Lancaster Corporation on July 1 next for the benefit of the town. It has also been decided to utilise forthwith a portion of the premises as a public free library. The Institute, which has cost the donor about 20,000*l*., includes an art gallery, schools of science and art, a music-room, a lecture theatre, a library and reading-room, besides facilities for conducting technical and other classes.

VARIETIES.

THE formal inauguration of the newly-constructed auxiliary water-supply for Perth has just taken place in presence of a large attendance of the commissioners and the officials of the town. The new works have cost about 4,000*l*.

THE *Leeds Mercury* says:—The death has occurred at his residence at Blackburn of James Sharples, the working blacksmith, who some forty years ago made a great stir in the art world by engraving the well-known picture of the forge with a self-made tool and entirely without instruction. Sharples's task occupied his leisure time for five years. It was only when he took the plate to the engravers that he first saw an engraved plate produced by any other man. The deceased, who had suffered from heart disease for some time, was sixty-seven years old.

BEFORE Mr. Justice Grantham and a jury a Mr. Jordan and his wife claimed damages from the landlord of a house in Leytonstone, named Morley, on the ground that the latter had made a false statement as to the drains of the house being in good order; and also for false imprisonment. When the

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plaintiff moved out of the house in consequence of bad drainage and of the illness which it caused, he was in arrear with his rent, and it was alleged that the defendant gave Mrs. Jordan into the custody of a policeman. The jury awarded 60*l.* damages.

THE Secretary of the Home Arts and Industries Association, Royal Albert Hall, reminds us of the annual exhibition of works held in the minor arts, wood-carving, repoussé work in metal, basket making, &c. Assistance in the shape of voluntary help or money is desired to carry on the work.

OUR attention is called by Messrs. Marion & Co. to "Downey's Art Studies," a publication which they are just issuing, and which is a new departure and interesting from two points of view. In photographic journals and photographic circles it is a much debated point whether a photograph can be artistic, but Messrs. Marion and Co. think these publications produced by Messrs. W. & D. Downey go far to show that a very near approach may be made to art where photography is used by a master. However that may be, the public at least seem to think they have a good thing offered to them, to judge by their eager purchases. The other point which is interesting is the one showing the power photography gives to produce a good printing plate, and at a cost that permits of these pictures being published at the low prices given in list. It must be understood that these productions are printed in a very similar manner to engravings, and are quite as permanent.

SOCIETY OF ARTS.

THE Council have awarded the Society's Silver Medal to the following readers of papers during the session 1892-93:—

At the ordinary meetings:—

To James Douglas, for his paper on "The Copper Resources of the United States."

To William Key, for his paper on "The Purification of the Air Supply to Public Buildings and Dwellings."

To Professor Frank Clowes, D.Sc., for his paper on "The Detection and Estimation of small proportions of Inflammable Gas or Vapour in the Air."

To Thomas R. Dallmeyer, for his paper on "Tele-photography."

To Gisbert Kapp, for his paper on "Some Economic Points in connection with Electric Supply."

To H. van der Weyde, for his paper on "The Pictorial Modification of Photographic Perspective by the use of the Photo-corrector or Visual Lenses in Portraiture and Landscape."

In the Indian section:—

To Herbert Thirkell White, I.C.S. (Burma), C.I.E., for his paper on "Upper Burma under British Rule."

To J. Barr Robertson, for his paper on "The Currency Problem."

To Sir Juland Danvers, K.C.S.I., for his paper on "Indian Manufactures: their Present State and Prospects."

In the Foreign and Colonial section:—

To Cecil Fane, for his paper on "Newfoundland."

To H. A. McPherson, for his paper on the "Philippine Islands."

To W. B. Perceval, agent-general for New Zealand, for his paper on "Aspects of Federation from a Colonial's Point of View."

In the Applied Art section:—

To Hugh Stannus, F.R.I.B.A., for his paper on "The Theory of 'Storiation' in Art."

To Wilton P. Rix, for his paper on "Pottery Glazes: their Classification and Decorative Value in Ceramic Design."

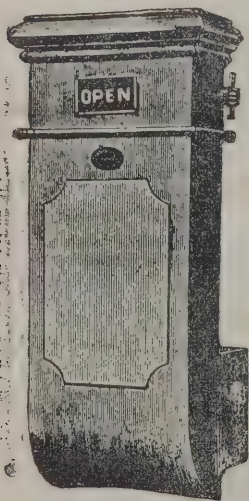
To Professor W. M. Flinders Petrie, for his paper on "Primitive Art in Egypt."

A vote of thanks was passed to Sir Edward Braddon and Mr. Dredge—who, as members of Council, were ineligible to receive medal—for the following papers:—

To Sir Edward Braddon, K.C.M.G., agent-general for Tasmania, for his papers on "Australasia as a Field for Anglo-Indian Colonisation," and "Russia as a Field for Tourists."

To James Dredge, for his paper on "The Chicago Exhibition, 1893."

THE Forestry section of the Gardening and Forestry Exhibition is now fairly complete, and nearly all the exhibits promised by official bodies and private individuals are now *en evidence*. Among them will be found a most interesting consignment from Balmoral, lent by the Queen, as well as a vast number of examples of what may be termed the curiosities of forestry, illustrating abnormal growths and eccentricities of tree life. Other exhibits set forth the varying effects on timber of salt and fresh water, and the ravages of insects.



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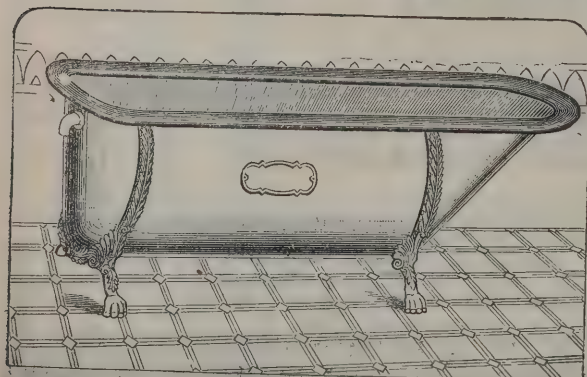
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HOLBORN AND STRAND IMPROVEMENT SCHEME.

THE following is the description accompanying the plan for this improvement by Mr. C. J. Shoppee, president of the Surveyors' Institution:—The new street would commence at the end of Theobald's Road and be continued southwards, 100 feet wide, to Holborn, with a circus 250 feet diameter at Holborn. Thence through Lincoln's Inn Fields to a second circus, with spur streets east and west 70 feet wide, one leading to Catherine Street and one to St. Clement Danes Church, with a street 60 feet wide leading directly to the church of St. Mary-le-Strand. From the circus in Lincoln's Inn Fields the street would be inclined towards the Strand, 70 feet wide, and pass under a bridge or viaduct at Surrey Street to the level of the approach to the Victoria Embankment. The buildings on the west side of Lincoln's Inn Fields would remain, their forecourts being added to the new street. It is proposed to continue the present street on the east side of Lincoln's Inn Fields to Holborn and to improve the access to Waterloo Bridge by widening a portion of the Strand.

ENGINEERING WORKS IN GREECE.

IN recent years many great engineering works have been projected, the *Glasgow Herald* says, in Greece, and some of them have been carried to completion. When we first knew the country its only railway was a short one uniting its capital with its port of the Piræus, but a few years ago it was proposed to connect Athens with the European railway system through Salonica, and this work has been in part carried out. Besides two shorter lines, there is also now the long railway from Athens across the Isthmus and along the southern shore of the Gulf of Corinth to the north-western extremity of the Peloponnesus. In addition to these works and the draining of Lake Copais, from which the Romans used to obtain their favourite eels, an old project of the Emperor Nero has been revived, and the Isthmus of Corinth has been cut by a canal which will be opened in a few weeks. To the early Greeks the need for this canal was not apparent, for Greece had its face turned towards the east, and in its youth its most active intercourse was over the Ægean Sea. At a later period some of its more enterprising states founded colonies on the Adriatic and elsewhere, but in its early days Greece regarded the Ægean as

its great sea—its archipelago, and Greek history of that period deals mainly with its shores. Even now it is interesting to note how eastern and western navigation are separated at the Isthmus, and how at its one side there are craft of various kinds, but all Oriental in rig, their varieties nearly all bearing Turkish names, but the fashion of their hull, spars and sails such as is described in the pages of Homer; while on the other side there are no levantine craft, but all are western in style, and the lateen, or latin, sail is predominant.

In early times the Isthmus was regarded, not as the barrier between two seas, but as the way between the Peloponnesus and the mainland; and Corinth probably first acquired importance from her position enabling her to control this road. When she had her colonies in the Ionian Islands she must have found that the Isthmus was a useful barrier against the fleet of Athens during the Peloponnesian war. But all these things were changed when Rome had conquered Greece and the East, and when practically the whole navigation and commerce of the Mediterranean fell under one control. Then Roman ships and galleys would find the rough passage round the Peloponnesus both difficult and dangerous, and a great part of the trade between the east and west would still be carried on across the Isthmus. This commerce raised Corinth to the height of its wealth, although the glory of its independence had departed. The Emperor Nero proposed to facilitate trade by making a waterway through the Isthmus. The work was actually begun. Many pits were sunk along the line of the proposed canal and excavations were opened at the eastern end. But there the work was abandoned, and history does not say why Nero did not complete his project.

About twelve years ago this old scheme was revived with vigour, but the enterprise had many financial vicissitudes, and it is only now that the design is about to be completed. The route for the canal chosen by modern engineers is exactly that marked out in Nero's time, and although this is not the line involving least actual cutting, yet it is that in which the minimum of surface water will have to be dealt with, and thus it is interesting to notice how those ancient Roman engineers must have weighed every consideration in such a work as this. The Isthmus is saddle-backed in form, and the greatest depth of cutting will be about 280 feet, while the length of the canal is $4\frac{1}{2}$ miles.

The traveller now going to Athens will probably select the route by Brindisi and Corinth as at once the most interesting and most expeditious. After visiting the lovely island of Corfu,

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he will sail by Cephalonia, and then by Ithaca, the island of the wily and wandering Ulysses, and the home of the faithful and patient Penelope. Then he will admire Zante, the most beautiful and fertile of the Ionian group, but which seems to be on the focus of the destructive earthquakes which have shaken the shores of the Corinthian gulf at intervals since the earliest times, and which has even now suffered terribly from one of these catastrophes. Anon the traveller will arrive at Patras, and amid the clamour of boatmen and porters will be landed at the railway station.

The railway from Patras to Corinth runs along a flat belt of land between the sea and the mountains, which form the northern wall of the Peloponnesus. It does not yield in beauty to any line, not even to that along the Genoese Riviera, and in classic interest it excels them all. It passes among orange groves and vineyards and feathery palm-trees, while the mountains, close on the right hand, rapidly change in form and colour as the train moves on. Occasionally a mountain stream leaps from the high cliffs, and, falling in spray in the gardens below, breaks up the sunshine into bands of rainbow colour. On the left hand one has glimpses of the sea through the foliage, while sometimes the railway crosses the head of a shingly bay, and the wavelets of the gulf roll the pebbles almost to one's feet. Or a long, narrow creek, running far into the land, is crossed. It is packed full of picturesque lateen-sailed fishing-boats, while a little village half hides, half shows itself from among the trees. Scenes of classic interest are constantly being passed close at hand, while away across the gulf towers the great snow-capped Mount Parnassus, the haunt of the Muses, and on its flank is Delphi, the place of the most celebrated of ancient oracles. The little inlet, where its port of Krissa stood, can just be distinguished, and there is hardly time to recall to memory the great sea-battle which the fleets of Athens and Corinth so fiercely contested there, ere one's interest is attracted by some new scene.

There is a railway station at New Corinth, where used to be a port of the ancient city of the same name. The site of the latter town is about a mile to the right, and on a little plateau about 300 feet above the level of the sea. It commands a beautiful view down the Corinthian gulf, and of the mountains on both its coasts. The town has disappeared, all but seven columns of a Doric temple. Behind rises the Acro-Corinthus, a great rock which has always been a stronghold, and which played its part in the Greek War of Independence. Athens can be seen from its summit.

The journey across the Isthmus is not so interesting now as it used to be by coach, for then there was time to stop and examine the remains of the Stadium where the Isthmian games were held, and to inspect the line of the great wall which ran across from sea to sea, and which the Peloponnesian States used to combine to defend, but now the railway drags one on, and no halt is made. The view from the summit of the Isthmus is very fine. Towards the east stretch the waters of the Saronic Gulf, with its rugged, winding shores, and its surface broken by numerous islands, among which Salamis and Ægina are prominent, and on the west lies the Gulf of Corinth, bounded on both sides by bold mountain ranges. The land around is a mass of mountains, with a few narrow fertile valleys, and is a fair example of the soil of Greece.

After leaving Kalamaki on the eastern side of the Isthmus, the railway passes round a shoulder of Mount Gerania, and approaches the celebrated pass where the giant Sciron opposed the passage of Theseus into Attica. Here the mountains incroach on the sea, and the line rises to a considerable height. Far beneath one's feet the waters of the gulf are lazily lapping, seeming a delicate green colour under the bright blue sky and over the yellow sand.

The considerable town of Megara, which used to contend with Athens until it was definitely humbled by its great neighbour, is reached. Here the peasant women wear the most picturesque costumes of any in Greece, and many visitors come from Athens to see them dance at their great yearly festival. The train halts at Eleusis, where the mysteries used to be celebrated, and one sees the way over which the sacred Panathenaic procession passed, and the marks of its chariot-wheels in the rock. Looking out through the narrow strait between Salamis and the mainland, one may descry the place where the great sea-battle was fought between the Athenians and the fleet of Xerxes—a battle which in its issues for us was one of the most momentous ever contested.

The railway does not cross the mountains by the Pass of Daphne as the road does by which the Panathenaic procession travelled, but it winds away far to the north of Mount Aijaleos, and crawls laboriously over a spur of the mountains. At last the plain of Attica comes into view, surrounded by its great mountains of Parnes, Pentelieus, and Hymettus, and verdant with its olive groves. Beside two hills on the farther side of the green foliage is a town with some important-looking modern buildings. On one of the hills are some columns and ruined walls. It is Athens and its Acropolis.

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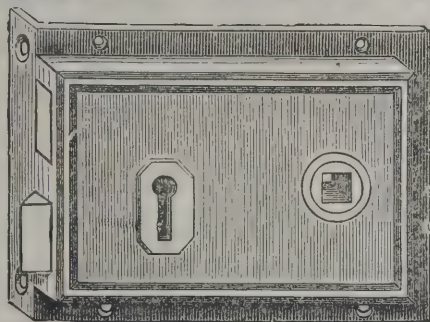
NEW CATALOGUES.

"RANSOME'S Wood-working Machinery" appears on the cover of a large and handsome illustrated catalogue of patented and improved wood-working machinery, comprising general and special wood-working machinery, machinery for sharpening, setting and adjusting saws and cutters, motive-power, shafting, pulleys, belting, &c., saw-mill appliances and accessories, saws, cutters, augers, tools and cooperage machinery. For facilitating the working of their business the Chelsea Engineering Works has been amalgamated with the Battersea foundry. The two businesses, hitherto known as A. Ransome & Co., and Ransome, Josselyn & Woods, respectively, have been owned for some years practically by the same partners, although the management has been individual. In future, however, they will be together known as A. Ransome & Co., Limited. The Stanley Works, Chelsea, are exclusively devoted to the manufacture of wood-working machinery and all appertaining to the same. At the foundry high-class and difficult castings are manufactured which foundries with only ordinary appliances could not cope with. Thirty-nine years' experience enables this firm to consider itself far ahead of all others in this branch of engineering. The catalogue contains between 230 and 240 pages, though it does not pretend to be an exhaustive list of the manufactures of the firm, but rather to be a thoroughly representative catalogue. As it is, however, it forms the largest treatise on wood-working machinery yet published. In addition, it is more than a mere illustrated list. The descriptions, the appliances, machinery, &c., that accompany the illustrations would probably give more knowledge on the subject of machinery of all kinds in a short time than could be acquired in other ways. Many also whose business is concerned with woodwork will find a large number of machines for varied purposes that they have not supposed had yet been invented. Appliances also are illustrated and described that will meet all the wants of the Canadian or

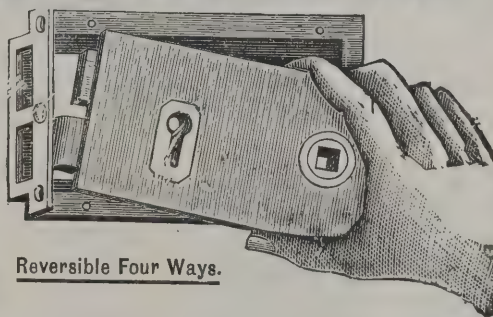
American lumberman, including even pioneer forest railways. Before putting to use all the contrivances for fashioning wood, sawing, planing, mortising machines, &c., the timber must be won from the forest, felled and transported to the saw-mills, and few persons would care to write down a list of all the tools and machinery that may be employed on any forest tree from its felling till it results in finished woodwork. We may add in conclusion that the catalogue illustrates, describes and codes between 700 and 800 machines, adaptations of machines and appliances for the conversion or in connection with the conversion of wood. It contains 441 wood-block illustrations, most of which are new and cut for the present edition.

We have received a very compendious illustrated list from Mr. John Clark, of High Street, New Oxford Street, W. The book comprises two sections, and traverses with considerable useful detail innumerable articles that are of constant requisition in house furnishing in the form of wire goods. One of the sections is more particularly devoted to fireplace furniture and accessories. Mr. Clark has long made a specialty of brass fire-guards and brass wire fenders. Specimens for all purposes are illustrated with a pleasing choice in regard of design. Curbs, fenders, fire-guards, &c., are not only used as a finish as regards appearance, but their *raison d'être* is to give safety. However, there are many special kinds which are termed "safety" fenders, &c., to distinguish them as being improved articles for special purposes; as, for instance, for nurseries, bedrooms, &c. There are, also, the upholstered seat-fenders for clubs, billiard-rooms and the like. Polished and lacquered brass kerbs appear in a number of different and pleasing patterns. There is a great scope for ornamental effect in fancy fireguards, and Mr. Clark has taken full advantage of such possibility to produce numberless specimens, and it is hard to pick out any one, whether of the hanging or standing fireguards, for special reference. Individual taste must guide selection. Among them, as may be expected, of course, are illustrated many standing fireguards, with stained and leaded glass centres. There are also specimens of the automatic fireguard and dumb waiter combined—often a very useful appliance. The other section relates to the innumerable wirework goods for the garden, the house, birdcages, aviaries and bird palaces also, it may be said, included. Kitchen requisites include sieves, wire-lamp shade-holders, meat safes, eel traps, traps for mice and rats, appliances useful for cooking purposes. Builders' screens and sieves for masons and plasterers, agricultural sieves, &c., are also quoted. The

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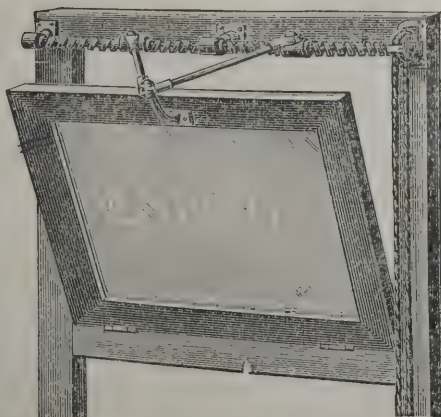
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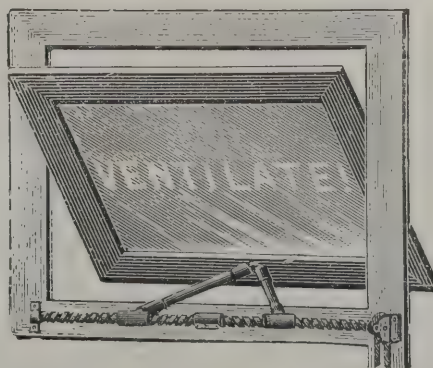
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designs for window blinds in wove-wire are shown, as also designs in stained-glass, ornamental wirework goods for the garden, conservatory and house, flower-stands, hanging baskets, trellis-work, fencing, pheasantries, rosaries, coil cases, &c. With this résumé we must leave those interested to consult the catalogue, or their imagination, as to other goods that space will not permit to allude to in detail.

UNDER date April, 1893, Mr. John Jones, 40 Sydney Street, Chelsea, S.W., has issued a revised edition of sanitary specialties to submit to the notice of architects, surveyors, engineers, medical officers of health, builders, sanitary inspectors, &c. In revising the edition it has been considerably added to. The goods are recommended from practical tests, and attention is invited to several improvements made in Jones's patent goods. For testing drains with water the stopper must be used. Jones's patent drain and pipe stopper is an ingenious device, the principle depending on the use of a bag which is inflated. His patent expanding screw-stopper consists of a rubber ring between two discs of galvanised iron with or without centre outlet, also with centre outlet and indicator attached to gauge the fall or detect leakage. These have all been premiated at exhibitions. Next are shown and described several varieties of patent air-tight manhole-covers with automatic seal, Jones's patent drain ventilation for deep manholes for house drainage, &c., patent air inlet ventilators for house-drains (all of these have been premiated), patent chimney-pots, patent branch inlet or junction pipes, patent English-made pedestal closets, Crosse's invisible flush fresh-air inlet ventilators for houses, stables, cowsheds, &c., as supplied to the London General Omnibus Company and having received a gold medal, new patent silent valveless flush cistern suitable for all closets and approved by the water companies, also Jones's drain-clearing machinery.

WE have just received from Messrs. Baird, Thompson & Co. illustrated lists of the Baird-Thompson patent air propeller, for ventilating, cooling, drying or removing heated air, steam and dust, or for any other purpose depending upon the movement of air in volume, also for combined ventilating and warming, which is estimated to give a greater volume of air, requires less power than any other propeller. Also of the Baird-Thompson improved system of positive ventilation for ships, yachts, &c., of which they are patentees and sole proprietors. It is a combination of upcast and downcast ventilators, which, in conjunction with an arrangement of pipes delivering compressed air, create an induced current, con-

stantly changing the atmosphere in ships' holds and between decks, so as to maintain it in a continual state of purity. When applied to passengers' quarters it is so adapted that all possibility of draught is entirely avoided. These currents being produced by natural means, but independent of the fluctuating power of the wind, the efficiency of the ventilation cannot be impaired, and is maintained under all circumstances and conditions. It is simple in its application and economical, both in first cost and maintenance. Air is compressed by means of the Baird-Thompson specially-constructed patent compressed air-engine, fixed in any convenient part of the ship, and is conveyed in pipes of small area to the part requiring ventilation, and there allowed to escape through our patent "Grahtryx" air nozzle, fixed at the mouth of the ventilating shaft, so as either to exhaust foul air or impel in fresh air, as may be required.

CHESTER ROYAL SHOW.

Tangyes, Limited.

THERE is a fine exhibit of Tangyes' engines and tools at Chester Show. Since the introduction of Tangyes' Gas-engine (Pinkney's patent), large numbers have been sold and universal satisfaction given by them; the sizes varying from $\frac{1}{2}$ horse-power to 115 horse-power in use for driving machinery of very delicate construction. Owing to their special construction defects known to exist in other gas-engines are entirely done away with, the result being freedom from shock, steady running, durable working parts, perfect lubrication, proportionate distribution of metal to resist all possible strains, large working surfaces, hand-starting perfectly easy, durable ignition tube, self-adjusting timing valve, and for large engines a positive mechanical pressure starter. Several later improvements have been added which makes these engines exceedingly economical when running at high and low speeds, so that engines required to do ordinary work in the day time can by one simple movement be converted into an electric-lighting engine at night when required. Also engines fitted with a special arrangement of lubricators can be left to run for a whole week without the slightest attention. One has been running already on a sewerage system for several months without a hitch. Besides applying these engines for driving dynamos for electric lighting, printing machinery, &c., Messrs. Tangye are devoting much time and capital to the further development of larger size gas-engines to work with producer-gas for driving large factories

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PAPER-HANGING.—Walls prepared with **KALLKOLITH**, thinned with seven parts of water, give a great additional advantage to the hanging of all descriptions of papers.

TESTIMONIALS.

21 New Bridge Street, London, E.C.: February 23, 1886.
I have had some trials made with the **KALLKOLITH** during the past few weeks, the results of which are very satisfactory. The **KALLKOLITH** is to be used as the first coat of paint on wood and other substances, and is of such a nature that the ordinary work in preparing for paint is considerably lessened, and the usual number of given coats now reduced, and, once fairly introduced in the market, I am certain there will be a large sale.
J. WM. STEVENS, Architect and Surveyor.

75 Newman Street, Oxford Street, W.: Feb. 15, 1887.
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requiring several hundreds of horse-power. They have at the show:—

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7 "	"	"	15 "	driving saw bench.
5 "	"	"	10.5 "	driving 5-foot geared three-throw pump.
3 "	"	"	6.5 "	driving dynamo.
1.5 "	"	"	2.5 "	driving friction hoist, self-contained.

Tangyes' Girder Steam-engine, having steam cylinder 16 inches diameter and a stroke of 32 feet, is typical of its series, and has been revised throughout to stand a working pressure of 100 lbs. per square inch; all the bearing surfaces are most simple, and where necessary the bearings are lined with "plastic" metal, and are adjustable. The bed is of the well-known "girder" form, and is of strong box section; it has the main pedestal and crosshead guides cast with it. The crosshead guides are bored and the flange faced at one operation, insuring accuracy in the alignment. The cylinder and the steam chest are steam-jacketed and lagged; the slide valve is fitted with the Tangye-Johnson patent automatic cut-off gear, which is now widely known as a simple, reliable and economical cut-off gear, and being without the complication of detail found in many cut-off gears is welcomed by the ordinary engineman. Economy has not been sacrificed, however, to simplicity, and this gear will compare favourably with any other. This gear can be fitted to most of the various types of engines made by Tangyes, Limited, and is strongly recommended for use where the load is at all variable. The lubrication is effective, the cylinder being fitted with a Tangyes' sight-feed lubricator, and all the working parts with conveniently-placed oil boxes. The automatic gear is controlled by a Tangyes' improved "Porter" governor, driven by two bolts, and the whole of the details bear evidence to the great care which has been exercised in designing the engine.

Tangyes' 12 by 8 by 24-inch "Special" Steam Pump is a good example of a type which is found all over the world, and which is made in hundreds of combinations and for every conceivable duty. To meet the recent general rise in steam pressures, this pump is now made from entirely new patterns, the steam cylinders being strong enough for a working steam pressure of 100 lbs. per square inch and the pump for a total head of 300 feet. The "Special" pump is also made in other forms for heads of 600 feet and 1,000 feet, and for use in hydraulic work to pump against pressures up to

2½ tons per square inch. As economy of working is now demanded even in the simplest forms of steam-pumps, Tangyes, Limited, have compounded their various types, and, though not rivalling the economy of a high-class steam-engine, the compounding will be found to effect a considerable saving over the simple direct-acting pump type. The pump is suitable for rough work, as the working parts (with the exception of a small portion of the rod) are entirely under cover and protected from damage. Where it is necessary to condense the exhaust steam, this is done very effectively by the addition to the pump of Floyd's patent exhaust steam condenser. The steam tappets are very reliable, and are fitted with special adjustments. The pump glands are of Floyd's patent anti-friction stuffing-box type, and with them it is impossible to damage the rod by careless screwing down of the end gland. Various small improvements have been introduced, and the workmanship employed in the construction of the pump is of the highest order.

Tangyes' Horizontal Duplex Pump, having 6-inch steam cylinders, 4-inch water cylinders and strokes of 6 inches, made to work with and against a steam pressure of 160 lbs. per square inch, has been designed mainly for boiler feeding, where high steam pressures are usual. It is strongly made throughout, and great care is exercised to secure sound materials and good workmanship. In this respect it is far ahead of most types of duplex pumps on the market. The valves and seats are of gun-metal, the former working on central spindles fixed to the body of the pump, so that the heat of the valves has no tendency to loosen the seats. They are easily examined by removing the covers to the valve chambers. A handle is sometimes fitted to the pump to enable the boilers to be filled with water by hand, when not under pressure. Messrs. Tangye also make a large number of duplex pumps of various types suitable for heads of 300, 600 and 1,000 feet, and to work against hydraulic pressures of 500 lbs., 1 ton and 2 tons per square inch.

The Six-inch Sliding and Screw-cutting Lathe, made by Tangyes Machine Tool Company, Limited, with gap bed and strong double-gear head stock, has a large steel spindle running in conical bearings with the necks case-hardened and carefully ground. The bed is wide, to insure perfect steadiness when a heavy cut is being taken. The saddle has a quick return hand motion, and carries a compound slide rest arranged to swivel for conical turning, and is fitted with quick withdraw motion. The whole design is very strong, and the

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Portable Cistern Filters.



bearing surfaces are large, so that the lathe will retain its accuracy for a lengthened period. The lathe supplied complete with face plates, change wheel, countershaft, with fast and loose pulleys, and a set of spanners.

The Circular Saw Bench, Size A, has the frame cast in one piece, and is of strong section. The table is accurately planed, and has rollers fitted at each end, and a loose gap plate to allow of the removal of the saw. The spindle runs in long bearings lined with anti-friction white metal, and is carried by a lever arm, which is raised and lowered by screw and hand wheel conveniently placed in the front of the machine. The face swivels for bevel sawing, and can be entirely removed when cross cutting.

Tangyes' 5 by 6 inch "Soho" Engine with Governor, mounted on a Tangyes' Colonial Boiler, is a compact arrangement especially suitable for country use, where wood or other inferior fuel is abundant. The engine is simple and well made, the governor being of the "Soho" type, which is so designed that in the event of the belt breaking or coming off the steam is shut off. The boiler has a large grate for wood burning, and has the furnace beneath the barrel, the flame passing along below the barrel and returning through the tubes to the chimney; in this way the heat is well absorbed. The casing is of steel, and is thoroughly protected with fire-bricks. The engine and boiler are sent out complete with feed pump, safety valve, stop valve, pressure gauge, water gauges, and all necessary steam and water pipes.

Robey & Co.

THE exhibits of Messrs. Robey & Co. include Robey & Co.'s horizontal steam engine, fitted with their patent automatic trip expansion gear—an engine of substantial construction, suitable for doing heavy work, and is at the same time provided with a high-class expansion gear for securing the greatest economy in fuel and perfect governing under varying loads. It is an engine which, on an estate, can be set to do thrashing, sawing and other work in the daytime with the greatest economy, and at night can be employed for driving a dynamo for electric illumination. Messrs. Robey & Co. have had a large experience with different varieties of expansion gear, which has enabled them to discern the weak points in each kind, and as a result they have produced their patent trip expansion gear, which is the simplest, most effective, most easily worked, and gives the most satisfactory results of any hitherto made. Messrs. Robey & Co.'s compound "Robey" engine and locomotive boiler com-

bined, fitted with patent automatic governor and link expansion gear, is a class of engine specially suitable for driving electric-light installations, mills, factories and other machinery where perfectly steady running is required, being very powerful for the space occupied, and working with perfect regularity with very varying loads, also extremely economical in fuel, consuming under 2 lb. of best Welsh coal per indicated horse-power per hour. The working parts are perfectly balanced so as to run safely at high speed. They have large wearing surfaces of ample size and run cool with heavy loads, and are well lubricated for long runs.

In addition to the above, Messrs. Robey & Co. exhibit specimens of their medium and long-stroke horizontal fixed engines, fitted with their patent automatic governor and link expansion gear; likewise their superior portable engines and wrought angle-iron framed thrashing and finishing machines, steel-framed stonebreakers, centrifugal pumps and high-speed vertical engine for electric-light work.

We may specially notice the patent gas and oil-engines on their stands; and respecting the patent gas-engine observe that the combustion chamber is of improved design, avoiding shock and insuring a pure change of gas and air in igniter passage, irrespective of the power given off. Valves can also be taken out without breaking any joints. The plan adopted for regulating the speed is a special feature, and is not only much simplified, but is also thoroughly reliable. Engines fitted with Robey & Co.'s governor will work with the same slight percentage of variation that their high-class steam-engines do; thus these gas-engines are specially suitable for driving dynamos and other machinery direct. The speed can be readily adjusted to either a low or high velocity.

Robey & Co.'s patent portable oil-engine is shown. The engine works on the Otto cycle, and is mounted on a strong steel cylindrical tank which contains the water required for cooling the cylinder, round which such water is forced by a circulating pump. A fore-carriage and travelling-wheels are placed under one end of this circulating tank. A chamber containing a week's supply of oil is rivetted under the other end of the water tank, and this forms a convenient means for carrying the axle of the hind travelling-wheels. The oil is pumped from this tank and forced against an internal vaporiser, where it is instantly converted into vapour, mixed with a due proportion of atmospheric air and exploded. The rise of pressure through the working stroke is gradual and violent shock avoided.

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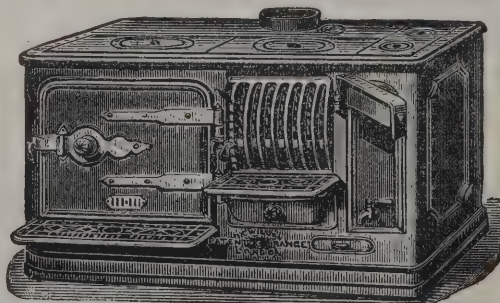
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THE USE OF IRON AND STEEL FOR STRUCTURAL PURPOSES.*

THE subject that I have chosen for this evening, viz. "The Use of Iron and Steel as applied to Structural Purposes," is a very large one, and one that it is difficult to condense into the limits of a single paper. Moreover, owing to unforeseen circumstances, I have not been able to devote the amount of time to the preparation of the paper that I could wish to have done. I must therefore ask your indulgence for any defects, and I trust that at all events there may be some information contained therein that may prove of use to the younger members and students of the Association. With respect to its useful properties iron may be said to occupy the first place among metals. It is the strongest, is comparatively light, durable, easily worked, and being capable as it is of assuming the three forms of cast-iron, wrought-iron and steel, each of which has qualities suited to different purposes, it has a very wide field of use, and it is not too much to assert that it has been, in one of its three forms, an indispensable element in all the most important developments in the industrial progress of the human race. Chemically speaking, iron is one of the elements crystallising in the cubic system, the forms most generally observed being cubes or octahedra, the latter often in skeletal shapes and grouped into tree-like aggregates. Solid masses of iron when fused, which have not been hammered or subjected to pressure, show, when polished and etched, a granular crystalline surface, which shows this structure. It has a specific gravity of about 7.7, which may be reduced by cold rolling or wire drawing, but may be restored again by annealing. It becomes magnetic when brought into the field of a magnet or when surrounded by an electric coil. It may be volatilised at the temperature obtained by the electric arc, when it burns with the production of a dense orange-red smoke. The difference in the chemical composition of iron and steel is so small that it is extremely difficult to say how it affects their structure; in some cases so small an addition as 1 part in 1,000 of one-tenth per cent. of a foreign substance producing a marked difference in the structure and quality of the resulting metal. Practically the sole difference between

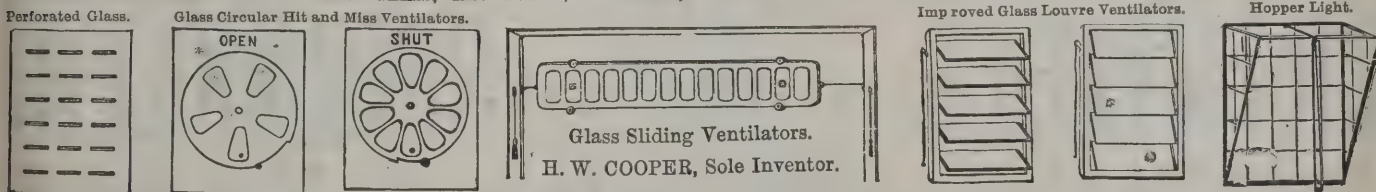
cast-iron, wrought-iron and steel lies in the amount of carbon which they respectively contain, and it cannot be said at what point the one ceases and the other begins, steel holding as it does an intermediate place in a series beginning with the most impure cast-iron, and ending with the softest and purest malleable iron. The following, however, may be taken as approximately defining the three forms of the metal:—Malleable or wrought-iron contains less than 0.2 per cent. of carbon, is infusible excepting in special furnaces, gives unsound castings when fused, cannot be hardened by sudden cooling from a red-heat, but can be welded and wrought into shape while hot. Steel includes all kinds of iron containing not more than 1.75 per cent. of carbon, these varying considerably in fusibility, hardness, susceptibility to tempering and malleability, the first two properties being increased by the increase of carbon, while the malleability is diminished. The limit of about 0.4 to 0.5 of carbon may be taken as that of ordinary malleable steel, above which come the more special qualities of tool and cutlery steel, which are chiefly valuable for their hardness. Cast-iron includes all iron containing more than 2 per cent. of carbon up to a maximum of about 4 per cent., is readily fusible at a temperature of 2,786 deg. Fahr., and, as its name implies, is used in the production of articles cast to patterns in moulds. There is another point to be noticed in considering the chemical composition of the three above-named forms of iron, and that is the condition in which the carbon exists; this applies especially to cast-iron and steel, and it has been shown by experiment to exist in two distinct forms, viz. the one in which it is wholly in chemical combination with the iron, and the other in which it exists separately in the form of graphite disseminated in dark scales through the mass of the metal. When it is in the former condition, the metal is hard, somewhat largely crystalline, uniform in structure, and of a silvery white colour. When in the latter the metal becomes softer, of a darker colour, assuming a general grey tint, the depth of which varies with the amount of carbon present in the graphitic state, and the structure becomes less uniform. The method of determining the amount of carbon and the form in which it exists belongs more to the science of metallurgy, but it is necessary to understand this much in order to follow intelligently the process of manufacture, which we will briefly glance at presently. The other most important elements which are found in iron generally are silicon, phosphorus and sulphur. The first-named is sometimes beneficial; the two last may generally be stated as

* A paper read before the Sydney Architectural Association by Mr. J. W. Ashcroft, and published in the *Australasian Builder*.

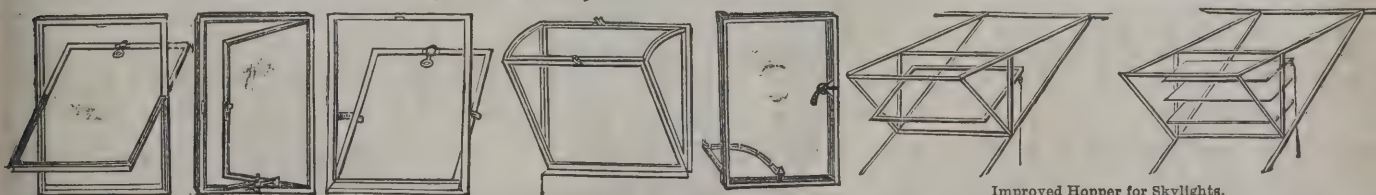


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wholly prejudicial, although the effect they produce is largely influenced by the amount of silicon or carbon present. This is often used with iron, chiefly to eliminate other impurities, and its general effect is to increase the tenacity and malleability of the metal, while that of phosphorus and sulphur is to make it brittle and unreliable, in the case of steel so small a quantity as 0.1 per cent. being the maximum amount allowable, although for fine castings a metal high in phosphorus is sometimes used where strength is not required, owing to the fluidity being increased by its presence. In the manufacture of iron as carried on now the first product that comes from the furnace is cast-iron, or, as it is commercially called, "pig" iron, from its being cast into a series of moulds known as "pigs." The ore, which consists chiefly of iron in combination with oxygen or with carbonic acid, is thrown into a large shaft after being mixed with sufficient limestone to remove the silicious matter and fuel enough to produce the required heat. The mixture is fed into the furnace in successive charges, and the fuel, assisted by a powerful blast, gradually raises the heat until the charge is in a state of fusion; chemical changes take place, the limestone and silica, together with a small portion of the iron oxide forming a fusible slag, which is drawn off from the furnace and thrown away. The iron oxide is reduced, and the metallic iron, being in a liquid state, falls to the bottom of the furnace, and is there tapped off into the moulds or pigs. The metal produced in its descent takes up a certain amount of carbon and silicon from the other constituents of the ore, together with phosphorus and sulphur, and is either white or grey, according to the manner in which the furnace is worked. The next process in the production of wrought-iron (and until comparatively recently in the manufacture of steel also) is that known as "puddling," and consists in oxidising the carbon and impurities, and separating them from the iron by heating the pig metal in contact with air and iron oxide. And it may here be mentioned, for the benefit of the younger members, that an "oxide" is a chemical combination of a substance and the gas oxygen, as with iron producing the familiar form of iron rust or with silicon forming quartz. During the operation a certain amount of slag is formed, and as the metal becomes infusible at the temperature of the furnace in proportion as the carbon is removed, this slag remains entangled in the mass, and has to be squeezed out, which is done under heavy hammers or hydraulic presses, some of the latter now in use being of a very large size, one which is in use at Cammell's Steelworks, at Sheffield,

being capable of exerting a pressure of 4,000 tons. When the slag is squeezed out, the lump of iron or "bloom," as it is called, is taken to a series of rolls, and in passing through these is gradually elongated and rolled into the desired shape, either into bars, angle iron, channel iron, rolled joists, &c. During this process an important change takes place in its structure, viz. the elongation of the crystals in the direction of the length of the bar, producing a fibrous texture and increasing the tensile strength to a great degree. We shall have occasion to refer to this later on, and to the property it has under certain conditions of reassuming the crystalline form which is the cause of many of the failures in iron structures. The next process is the production of blister steel from the wrought-iron by heating the bars in contact with charcoal for a certain time, thereby making it take up some more carbon. These bars are then broken up and melted in close crucibles and cast into ingots, which are then rolled out in the same way as the wrought-iron. As this steel is too expensive to be used for any purpose excepting where comparatively small quantities are needed, I will not dwell any further upon it, but will briefly describe the two most important methods of making steel directly from the cast-iron and by which nearly all the "steel" used for structural purposes is manufactured, viz. the "Bessemer" and the "Siemens" or "Siemens-Martin" processes. Each of these methods is again divided into the "acid" and the "basic." First made public at the Cheltenham meeting of the British Association, 1856, though not brought into workable condition for some years afterwards, the Bessemer "acid" process consists in melting the purest pig-iron obtainable and running it into a "converter," or iron vessel, lined with fire-clay and provided with nozzles in the bottom through which air is forced in large quantities, thus effecting the rapid oxidation and consequent combustion of carbon, silicon and certain other substances present in the pig-iron. It is found that a very high temperature is developed during the process, which is sufficient to keep liquid the resulting decarburised iron, which is at the close of the operation cast into ingots ready for rolling. The increase of temperature goes on progressively from the time the blast is turned on until it is again shut off. At the commencement of "the blow" the silicon and any manganese present are attacked, and when these are oxidised the action on the carbon begins. This period is marked by a rush of white hot flame and violent agitation of the molten mass; if the blowing be continued after the carbon is all burnt out the heat will be kept up by the combustion of the iron itself, which will become brittle and will possess all the

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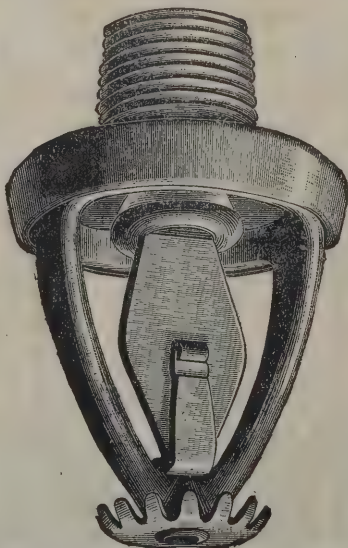
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properties of "burnt" iron. It can, however, be remedied by adding appropriate carbonising materials. Experience has shown that to obtain steel of good quality by this process the pig-iron employed must be exceptionally pure and free especially from phosphorus, sulphur and copper, as these substances are only slightly acted upon by the blast. Within certain limits silicon and manganese are however desirable, as they are completely oxidised, and assist in maintaining the heat in the converter. The action may be stopped when the carbon is brought down to the required percentage, or as is usually done now, the whole of the carbon may be burnt out, and at the end of the "blow" a compound of iron and manganese containing a large percentage of carbon is added in sufficient quantity to give the required percentage to the whole mass. This method of manufacturing steel has been brought to great perfection, but depending as it does upon the initial purity of the pig-iron used and the limited quantity of very pure iron of this sort, it follows that either only a limited quantity of steel can be made or that inferior iron must be used, with the consequent depreciation in the quality of the steel. The removal of the greatest enemy to the steel manufacturer—phosphorus—has been completely effected by what is known as the "basic" process, which is essentially the same as the above, only that the converter is lined with a "basic" material (in contradistinction to the "acid" or silicious lining employed in this) which combines with the phosphoric acid to form a slag, which is easily removed from the surface of the molten metal; but this process does not remove the sulphur or silicon, and iron free from these has to be used in the first instance, the effect of them, as is that of phosphorus, being to prevent the steel from rolling in a sound condition, and to make it quite unreliable. In the Siemens-Martin, or open-hearth process, the pig-iron is melted in a hollow hearth, and wrought-iron scrap is added in sufficient quantity to produce a steel containing the requisite amount of carbon, which is determined by taking samples from time to time and testing. This method was rendered practicable by the use of the Siemens regenerative furnace, by which a sufficiently high temperature can be maintained to keep the metal fluid. It will be seen that by this method also none of the injurious elements contained in the pig-iron are removed, although the percentage they bear to the metal is reduced in proportion to the amount and purity of the wrought-iron added. The "basic" system is also applied to this method of producing steel and is adapted in this case by forming the hearth upon which the charge

is melted of some "basic" substance, which combines with the phosphorus in precisely the same manner as in the Bessemer process. A method of combining the Bessemer and open-hearth processes is practised in some places, and the steel so produced is said to be of excellent quality and equal to crucible steel for most purposes. When the melted metal is brought to the right grade, it is tapped into a ladle, and then poured into the ingot moulds, which are made broader at the bottom than at the top for ease in removing; when it has solidified the moulds are taken away, the ingots brought to a full red heat and then taken to the rolls and rolled into shape in the same manner as wrought-iron. Having thus briefly glanced at some of the principal methods of manufacturing iron and steel, we will now turn our attention for a short time to the consideration of their adaptation to the various uses for which they are suited, and are coming into use more and more in buildings and structures of all kinds. Up to the present time the so-called mild steel, such as we find in rolled joists, channel-irons, &c., has proved to be unreliable when strained beyond the safe limits of wrought-iron, and there appears to be some change, either made at the time or going on subsequently to its manufacture, in its molecular structure, which causes a state of undue tension in the particles; and instances have been known where pieces of steel which have been lying untouched for years have suddenly split without any apparent cause whatever. Beginning now with cast-iron we have already seen that this crystallises in the cubic system, and this crystallisation has a very great influence in determining the strength of any section of metal; and to show this more plainly I cannot do better than quote from Messrs. Bloxham and Huntingdon's book on metals, p. 155. "When any substance crystallises, the crystallisation always takes place at right angles to the surface at which cooling or heating takes place. In other words the crystals will be formed so that their principle axes will be at right angles to the surfaces bounding the mass. The form in which iron tends to crystallise is a regular octahedron, a figure which may be represented by two square pyramids placed base to base. The importance of this may best be shown by a few examples. If a square bar be cast and cooled uniformly in all directions there will of necessity be regions in which the crystallisation proceeding uniformly from all sides will meet; along these planes of intersection there will be a confused crystallisation, and lines of weakness in the casting will result. Now let us observe what takes place in a round cast bar in which the lines of weakness are reduced to a mini-

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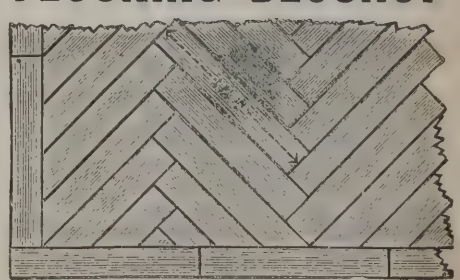
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mum. It is possible then by care in design to avoid many evils which might otherwise occur through ignorance of the laws of crystallisation. Fig. 5 represents the section of a part of the lower portion of the first hydraulic cylinder made for raising the tubes of the Britannia bridge. It broke under the great pressure to which it was exposed, the sides giving way along the planes of confused crystallisation. A new cylinder was then made, the section being altered to that shown in fig. 6. This answered perfectly, though the same kind of metal was used and no increase of mass was made. Cast-iron has an average tensile strength of about 8 tons to the square inch, and will stretch about one-eighth of an inch in 58 feet for every ton per square inch of tensile strain to which it is subjected, until its elastic limit is reached, which is at about 4 tons per square inch. It has a compressive strength of from 38 to 56 tons per square inch, the elastic limit being reached at about 15 tons, and a resistance to cross-breaking equal to 2,100 lbs. loaded in the centre of bar 1 inch square and 1 foot long between its supports." For the benefit of the younger members present it will perhaps be as well to state here what is meant by the term "elastic limit." In materials which undergo a perceptible stretch (either elongation or shortening) before finally giving way, it has been found by experiment that this stretch is, up to a certain point, directly as to the load applied, after which it increases in a greater ratio until the rupture takes place. This point, which is found by direct experiment, and requires the greatest skill and the most refined instruments to determine, is known as the "limit of elasticity" or "elastic limit." It will be seen that the compression strength of cast-iron exceeds its tensile strength in the ratio of about 6 to 1. Mr. Hodgkinson recognised this in designing the beam which goes by his name, in which the area of the bottom flange is six and a half times that of the top. Theoretically this is correct, and to a great extent in practice also, although not to the extent that one might expect. As was noticed in the first part of this paper, the centre part of a casting does not possess the same strength as the outer part, the crystals being coarser and larger, and this strength therefore must diminish in proportion as the section of the iron is thicker; heavy castings are also likely to flow in cooling, and for this reason where they have any strain to take they should always be tested before being used. Much uncertainty exists as to the best form to be used where cross strains are to be taken, and steel is now taking its place almost entirely where this is the case; but where a direct compressive strain is to

be provided for cast-iron may be used with advantage, as in columns, cradles, &c., for, especially in this colony, it can be cast to the desired shape at a very much less expense than steel could be obtained. The main points to attend to in designing a casting (and this applies to steel castings also) are:—(1) To avoid any sudden changes of shape or sharp angles which may produce lines of weakness in the crystallisation. (2) To keep as far as possible all the parts of the same thickness. (3) To so arrange the parts that the contraction consequent on cooling may not bring undue strain upon any one member more than another. Casting under pressure (one or two of the methods of doing which will be described in treating of steel) tends to produce a closer and more homogeneous metal and to increase its strength, and for this reason columns which have to take a great strain are cast on end and with a long head into which the lighter refuse matter rises, leaving the casting clean and sound beneath.

Turning now to wrought-iron, we find that as compared to cast-iron its tensile strength is considerably greater and its compressive strength less. In practice it is usual to assume its safe working strain at 5 tons for tension and 4 tons for compression. We have seen how the structure of wrought-iron changes from crystalline into fibrous during the rolling out of the "bloom" into bars, &c., and when we consider this alteration we can better understand why rolling the metal into bars should increase its tensile strength considerably. A very important peculiarity to bear in mind when using iron or steel in which the structure has been so changed is that if over-strained, over-heated, or subjected to frequent suddenly applied loads up to or beyond its elastic limit, this structure changes again and becomes crystalline, losing in strength, and ultimately causing rupture under a very much less strain than that which would have been perfectly safe in the first place, so that a structure, although over-strained, may stand for a considerable time, and at the last give way suddenly. Wrought-iron represents the metal in its purest form as a commercial product, the amount of foreign substances contained in it having been reduced to a minimum in the refining and puddling processes, and the quality of the iron depends upon the care bestowed upon it while undergoing these and the subsequent rolling processes. A good sample should, when fractured, show a fine fibrous structure of a grey colour, and should be easily malleable without showing any signs of splitting or cracking. Its use is almost universal, and, so far, it is the safest and most reliable of any material at our com-

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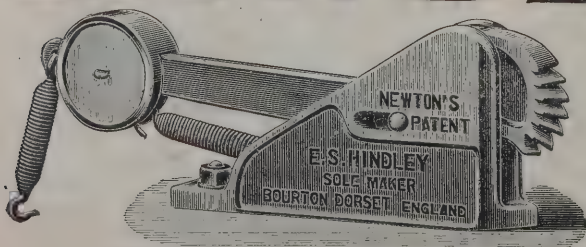
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mand for structural purposes. Steel, we have already seen, differs from wrought-iron only in its having a certain amount of carbon combined with the metal, from our approximate definition between the limits of 0.2 and 1.75 per cent. The addition of carbon appears to increase the tensile strength of the metal up to 1.5 per cent., and then gradually to diminish it until it merges into cast-iron. But although it increases the ultimate strength at which it would give way under a gradually-applied load, it renders it more liable to rupture under one suddenly applied, because the metal containing the lesser amount of carbon would stretch more, and by its stretching would gradually break the force of the sudden application, on the same principle as a spring. The average ultimate tensile strength of steel is about twice that of wrought-iron where the load is gradually applied; where suddenly applied, the results of experiments have been so contradictory that the matter is still left in a state of uncertainty. The causes of this uncertainty are:—(1) The effect produced by the small amounts of silicon, sulphur and phosphorus present in the metal, which effect is very much affected by the amount of carbon present, and the precise nature of which is not yet understood. This, as has already been pointed out, depends upon the purity of the pig-iron used in the first place, and if we could begin with perfectly pure iron we would get a perfect steel in chemical composition. But there is another cause also which makes it unreliable. The metal, when taken from the Bessemer converters or from the open-hearth furnaces, is cast into ingots, and it is often difficult to obtain sound ingots, the upper part being spongy from included hollow spaces, and sometimes honeycombed by these spaces arranged in lines perpendicular to the surface of the mould. This is attributed to the escape of gases absorbed during the process of manufacture, and thought to be nitrogen and hydrogen, although this has not been established by experiment, but it has been proved that iron and steel when solidified retain a considerable quantity of these gases, together with a little carbonic oxide. But whatever the cause, the fact remains that the upper part of the ingot is more or less porous, and the structure is not homogeneous when the ingot is rolled out, which is done in the direction of its length; one end of the bar or rail, or whatever it is rolled into, consists of this inferior part, and the other end of the sound lower part. In some places the length of rail section rolled from a single ingot is 120 feet, and it may be that when cut into lengths one length may be sound metal at

one end, and that which has been weakened by the honeycombing at the other. It has been sought to overcome this by applying pressure directly the ingot is cast. In Whitworth's method a ram connected to a hydraulic press is made to fit into the mould, and directly the metal has been run in it is brought down upon it with a pressure equal to several tons per square inch. Another method is to supply the ingot mould with a steam-tight cap, and by means of a flexible tube to introduce steam at a high pressure on top of the metal. These methods appear to prevent the escape of gas, but do not increase the density of the metal to any great degree, and the gas must remain in the ingot, though more uniformly distributed through it. Another method, and one which seems to be successful, although practised only to a limited extent, is to thoroughly stir the molten metal before pouring it into the moulds; large quantities of the secluded gases are expelled, and the metal becomes tranquil, and solidifies into sound ingots. From the foregoing it will be seen that, although steel is the stronger and tougher metal, and especially when rolled into plates or bars of small cross section is generally superior to iron, yet in the present state of our knowledge it will generally be found more advantageous to use iron where we have to depend upon the tensile strength, for the strength of a chain being its weakest link, so the strength of steel must be calculated from the worst results of the tests, unless there be some manifest outside reason for its giving a low result. Experience seems to show that it is only in thick sections that this unreliability exists when a fair margin is allowed for safety, but a great deal more has to be found out in regard to this form of the metal before we can depend upon it in the same way that we can depend upon iron. I have very little doubt that some day steel will take the place of iron entirely, but at present, although enormous quantities are made yearly, the output of wrought-iron does not diminish. I had intended to go to some extent into the nature of the stresses thrown upon the materials in constructing buildings of iron, so as to form an opinion as to the best class of metal to use in various positions; but I find that I have already reached the limit of a single paper, and so must be content to leave it out, especially as to the more artistic minds the subject as treated this evening must be a somewhat dry one. I have brought a few specimens of iron and steel freshly fractured, which I hope will assist in the understanding of my remarks, and I trust that the subject of stresses in iron structures may be taken up by someone more able than myself to do justice to it.

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ABSORPTION OF VIBRATION BY ASPHALTE.

THE following extract from Mr. Delano's treatise on asphalte, which we noticed last week, will probably be of interest to our readers:—

One of the most interesting applications of asphalte is that of bituminous or asphaltic concrete for quick-speeded machinery, such as dynamos and their motors, grinding machinery like Carr's disintegrator (700 revolutions per minute) hydro-extractors (1,400 revolutions per minute), printing-machines and percussive machines like gas-engines, stamping-presses, steam-hammers, spring-hammers, &c.

The author has during the last twenty years arrested many a lawsuit begun by indignant neighbours against users of machinery in the crowded houses of cities. A high-speed engine working in a cellar will make a seven-storey house tremble, and at night prevent sleep of the inmates.

The asphalte concrete may be run in moulds to any shape and sold by the cube.

The cube is complete when the mass is big enough. For instance, take the foundations for a stamping-press; the gradual annihilation of the concussion can be felt by placing the hand on the side of the block of bituminous concrete which receives it. The latest application of asphalte concrete for this purpose is that of the electric-light motors at Moët & Chandon's, Epernay, France, where it was absolutely necessary to prevent the 8,000,000 bottles of champagne in the cellars from shaking.

The foundations for the dynamos and their motors in most of the Paris theatres are of bituminous concrete. They are surrounded by brick walls. No vibration is felt; the temperature in the cellars where the engines are is 120 deg. Fahr.

For steam-engines the surface of the foundation must be laid in cement, or have a layer of stone, to avoid bad effects of oil and grease, which are prejudicial to asphalte after a certain time. This application of asphalte requires extra care, and must not be attempted except by professional asphalters, as a failure would be no trifling matter. Only the best materials must be used. A block may take three days or more to settle and cool.

The same effect can be obtained by successive layers of hot asphalte powder compressed in a strong steel frame, and this plan is used for steam-hammers, avoiding the jarring of walls and the breaking of glass in skylights, &c.

M. Malo was the first to use asphalte to avoid the vibration of machinery, and has carried out at Pyrimont Works, the

centre of the Seyssel Asphalte Concession, many ingenious applications. The author has followed his lead in Paris. The instances are now too numerous to detail; they vary from stamping-presses and printing-machines to the heaviest engines.

At the present time (1893) an underground railway is being constructed near the astronomical observatory of Paris. The astronomers find that their mercury-bath and various delicate instruments vibrate. Both M. Malo and the author are being consulted as to the remedy, which will have to be paid for by the railway company.

Either the instruments will have to be mounted on bituminous concrete foundations or else the whole building of the observatory be insulated by a wall of bituminous concrete at considerable expense.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

10861. James Kershaw and Wilhelm Gerlach, for "Improvements in water gauges."

10886. Edward Schery, for "Improvements in devices for suspending articles."

10913. Frank Ashwell and David Mein Nesbit, for "Improvements in heating and ventilating systems."

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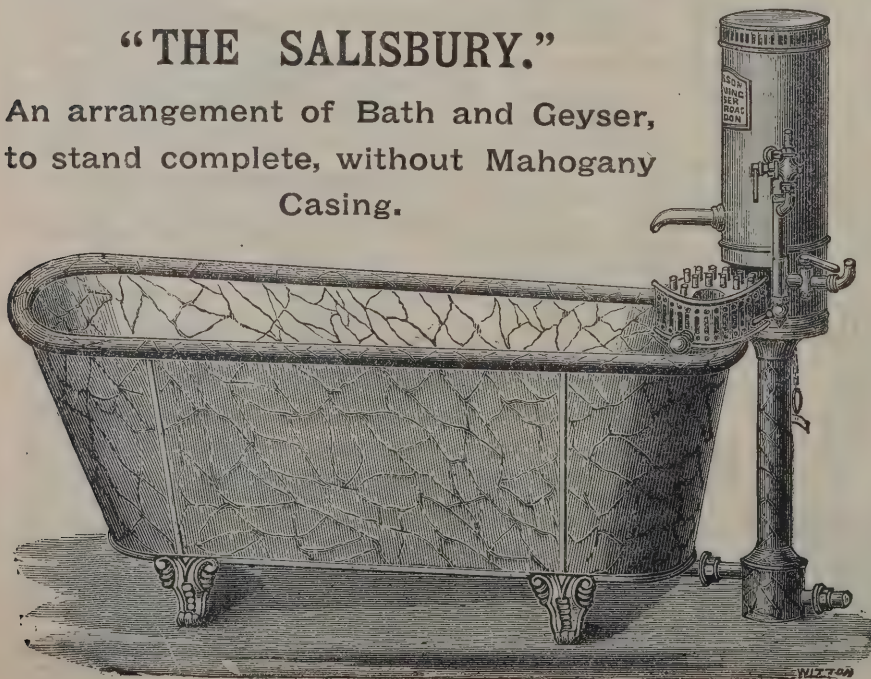
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MANCHESTER.—Aug. 12.—Designs are invited for Board School. Mr. W. E. Rowcliffe, 30 Cross Street, Manchester.

MONMOUTH.—Aug. 1.—Premiums of 30 and 20 guineas are offered for schemes for Disposal of Sewage. Mr. T. R. Oakley, Town Clerk, Monmouth.

ST. HELENS.—July 24.—Designs are invited for Public Library and Technical School. Premiums of 100l., 50l. and 25l. W. J. Jeeves, Town Hall, St. Helens.

TOTTENHAM.—Aug. 1.—Designs are invited for Town Hall and Board Offices. Premiums of 75l., 50l. and 25l. Mr. J. E. Worth, 712 High Road, Tottenham, N.

CONTRACTS OPEN.

ABERDEEN.—July 10.—For Alterations to Leylodge Public School. Messrs. Ellis & Wilson, Architects, 181A Union Street, Aberdeen.

ABERTILLERY.—For Additions to Premises, Blaenen Gwent. Messrs. Alfred Swash & John Bain, Architects, 3 Friars Chambers, Newport, Mon.

ABINGDON.—July 8.—For Supplying and Fixing Two Cornish Boilers, Steam Radiators, Cooking Apparatus, &c. Mr. G. Winship, Borough Buildings, Abingdon.

ASHFORD.—June 30.—For Painting at District School. Mr. C. D. Hume, District School, Ashford, Middlesex.

AYLESBURY.—July 3.—For Building Three Cottages. Mr. W. F. Taylor, Architect, Aylesbury.

AYLESBURY.—July 4.—For Building Brick and Iron Bridge over Canal. Mr. R. J. Thomas, Exchange Buildings, Aylesbury.

BALBRIGGAN.—July 5.—For Building Six Labourers' Cottages and Out-offices. Mr. C. M. Tuite, C.E., Dalymount Cottage, Drogheda.

BELFAST.—July 10.—For Building Eight Houses, Mount-pottinger. Messrs. J. Fraser & Son, C.E., Belfast.

BIRMINGHAM.—July 4.—For Constructing 5,000 yards of Railway. Mr. J. Mansergh, 5 Victoria Street, Westminster.

BLACKPOOL.—July 5.—For Building Shops for the Market Committee. Mr. J. Wolstenholme, Borough Surveyor.

BRIDGEND.—June 30.—For Construction of Retort-house, Retort-arches, Chimney-stack, Coal-store, &c. Mr. J. H. Dyer, Secretary, Gas and Water Company, Bridgend.

BRIGHTON.—June 30.—For Supplying Portland Cement. Mr. Francis J. C. May, Town Hall, Brighton.

BURY.—For Extension of Chesham Leather Works. Mr. Thomas Wilde, Architect, 12 Cook Street, Bury, Lancashire.

CAPE TOWN.—July 6.—For Constructing Sewers, Building Engine and Boiler-houses, &c. Mr. Clement Dunscombe, 32 Victoria Street, Westminster, S.W.

CARDIFF.—June 30.—For Extension of University College. Mr. George E. Robinson, Architect, Cardiff.

CARLISLE.—For Building Vagrant Wards at Fusehill Workhouse. Mr. H. Higginson, Architect, Carlisle.

CARLISLE.—June 30.—For Raising Portion of River Wall. Mr. J. Hepworth, Engineer, The Gasworks, Carlisle.

CHELMSFORD.—July 4.—For Building Cart-shed at Farm, Springfield. The Borough Surveyor.

CHESTER.—July 8.—For Construction of Grand Stand at Sandbach. Mr. Thomas A. Beckett, St. Werburgh's Chambers, Chester.

CHESTER-LE-STREET.—For Building Two Houses. Mr. John Dixon, 7 Red Rose Terrace, Chester-le-Street.

CILFYNYDD.—June 30.—For Building Public Hall and Reading Rooms. Mr. A. O. Evans, Architect, Pontypridd.

CORNHILL-ON-TWEED.—For Building Parsonage at Etal. Mr. W. Hope, Architect, 6 Grey Street, Newcastle-on-Tyne.

COSHAM.—July 3.—For Building Infant School. Mr. C. M. Houghton, Architect, 52 Orchard Road, Fawcett Road, Southsea.

COVENTRY.—For Building Power Station and Car House. Mr. H. O'Neill, Coventry and District Tramways Co., Coventry.

COYDOR.—July 3.—For Restoration of Church. Messrs. Bruton & Williams, Architects, 15 Queen Street, Cardiff.

CROYDON.—July 4.—For Repairing Road. Borough Surveyor, 8 Katharine Court, Croydon.

DAGENHAM.—For Building Ten Cottages. Mr. J. Rookwood, 47 Museum Street, W.C.

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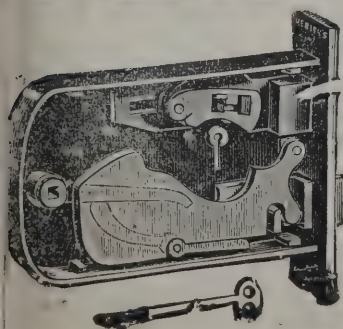
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ELLAND.—July 15.—For Rebuilding (Ironwork excepted) Bridgefield Mills. Messrs. C. & F. L. Horsfall, Architects, Lord Street Chambers, Halifax.

ESSEX.—July 1.—For Construction of Two Bridges. Mr. Percy J. Sheldon, Surveyor, Chelmsford.

FERNSDALE.—July 4.—For Building Thirteen Cottages. Mr. W. A. Lloyd, 20 Elm Street, Ferndale.

FORMBY.—July 6.—For Building Police Station. Mr. W. E. Vernon Crompton, Architect, Moot Hall Chambers, Wallgate, Wigan.

FULWOOD.—July 3.—For Building House at Wigan House Farm, for the Preston Guardians. Mr. Whitwell, Engineer, Fulwood Workhouse.

GATESHEAD.—June 30.—For Building Board Schools. Mr. S. Piper, Architect, County Chambers, Westgate Road, Newcastle-on-Tyne.

GLASGOW.—July 1.—For Supplying Cast-iron Pipes, Hydraulic Valves and Fittings, Bolts, Nuts, &c. Messrs. Ellington & Woodall, Palace Chambers, Bridge Street, Westminster.

GLOUCESTER.—July 3.—For Building Schools. Messrs. Medland & Son, Architects, 15 Clarence Street, Gloucester.

GRAVESEND.—July 1.—For Building Governor House at Gasworks. Mr. Joseph Davis, Engineer.

GRAYS.—July 4.—For Building Baptist Tabernacle. Mr. Charles Cobham, Architect, Shakespeare Villas, Grays, Essex.

GREAT YARMOUTH.—July 7.—For Building Two Houses. Mr. Charles G. Baker, Architect, Town Hall Chambers, Yarmouth.

HALIFAX.—July 1.—For Building Three Through Houses, &c. Messrs. C. F. L. Horsfall & Son, Architects, Lord Street Chambers, Halifax.

HALIFAX.—July 8.—For Alterations to Premises in Woolshops. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

HANWELL.—July 10.—For Supplying Broken Granite. Mr. W. S. James, Local Board Offices, Hanwell.

HASTINGS.—July 3.—For Construction of Public Conveniences, Marina, St. Leonards-on-Sea, and Queen's Road, Hastings. Mr. P. H. Palmer, Borough Engineer, Town Hall, Hastings.

HESTON.—July 10.—For Supplying Broken Granite and Flints. Mr. H. R. Peake, Town Hall, Hounslow.

JARROW.—July 4.—For Repairing Boundary Walls, &c. Mr. J. H. Morton, Architect, King Street, South Shields.

JERSEY.—June 30.—For Widening North Pier of Harbour. Mr. E. Berteau, Royal Square, Jersey.

LAMBETH.—July 4.—For Painting Wharf. Mr. Henry Blake, Sewers Office, Guildhall, E.C.

LEYTONSTONE.—July 4.—For Cleaning, Decorating and Painting Schools. Mr. W. T. Howard, Guardians' Office, Bishop's Road, Bethnal Green, E.

LISBELLAW, CO. FERMANAGH.—July 14.—For Rebuilding Church Tower. Mr. Thomas Elliott, C.E., Enniskillen.

LISCARD.—July 10.—For Addition of Pavilion to Hospital. Mr. Arthur Salmon, Surveyor to the Wallasey Local Board, Public Offices, Egremont.

LONDON.—July 7.—For Cleaning and Painting Houses. Mr. J. Williams, Midland Railway Co., Derby.

LYMM.—July 11.—For Constructing Stoneware Pipe Sewers, Supplying and Fixing Gas-engine, &c.

MALLOW.—July 7.—For Sinking Well and Fixing Pump, Shinakilla Cross. Mr. Maurice Regan, Clerk, Poor Law Office, Mallow.

MANCHESTER.—July 10.—For Building Offices, &c., and Entrance Gateways at Electric Light Station. Mr. John Allison, City Surveyor.

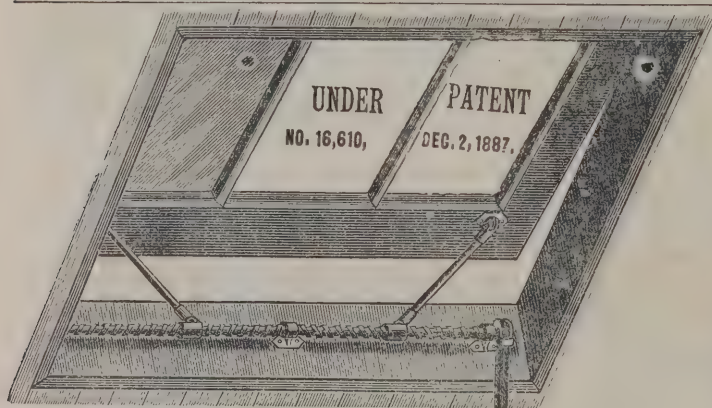
MANCHESTER.—July 1.—For Constructing Gasholder. Mr. C. Nickson, Town Hall, Manchester.

MITCHAM.—July 4.—For Building Bath-room at Holborn Union Schools. Mr. H. Saxon Snell, Architect, 22 Southampton Buildings, W.C.

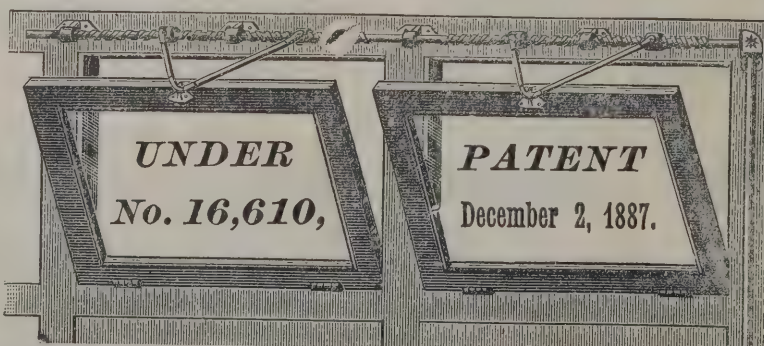
MIDLAND RAILWAY.—July 7.—For Cleaning and Painting Station Buildings, &c. Mr. J. Williams, Midland Railway Co., Derby.

NELSON.—July 5.—For Building Shed, Warehouses, &c., and Extension of Premises. Mr. T. Bell, Architect, 14 Grimshawe Street, Burnley.

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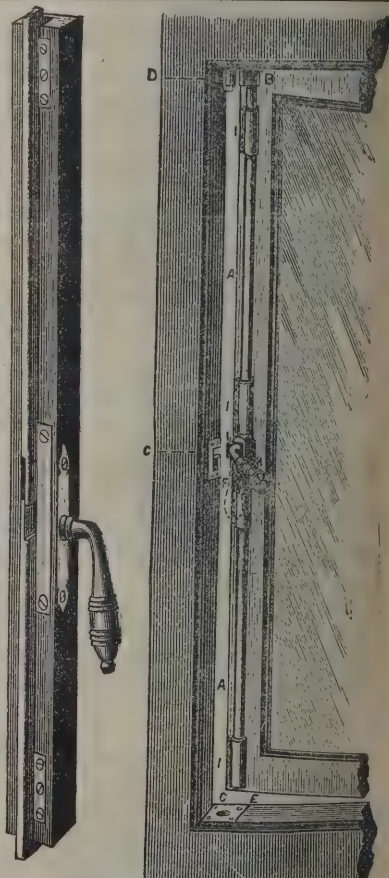
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ROCHESTER.—July 4.—For Making-up Road. City Surveyor, Guildhall, Rochester.

RAMSEY.—July 6.—For Building Schools, Boundary Walls, &c. Mr. J. W. Start, Architect, Cups Chambers, High Street, Colchester.

RHYMNEY.—July 3.—For Building House, Stables, Coach-house, &c. Mr. E. M. V. Vaughan, Architect, Cardiff.

SALFORD.—July 6.—For Erecting Engine and Coal Breaker, Elevator, Conveyor, &c. Mr. S. Brown, Town Hall, Salford.

SOUTHWARK.—July 4.—For Supplying Guernsey Granite Cubes. Mr. A. M. Hiscock, Vestry Hall, Borough Road, S.E.

STREATHAM.—July 3.—For Constructing Pipe Sewer. Mr. H. G. Hills, Board of Works Office, East Hill, Wandsworth.

SUNDERLAND.—July 11.—For Building Retort House, Coal Sheds, Purifying House, &c. Messrs. T. & C. Hawksley, 30 Great George Street, Westminster, S.W.

TREALAW.—July 10.—For Building Boys' School, &c. Mr. J. Rees, Architect, Pentre, Rhondda.

WANSTEAD.—June 30.—For Repairing Schools. Mr. J. T. Brassey, 70 Bishopsgate Street Within, E.C.

WESTMILL.—July 3.—For Rebuilding Bridge. Mr. Urban A. Smith, 28 Victoria Street, Westminster, S.W.

TENDERS.

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For Building Police Offices, Lodge Walk, Aberdeen. Mr. J. RUST, Architect, 224 Union Street.

G. Duguid, Aberdeen, mason . . .	£4,639	0	0
Hendry & Keith, Aberdeen, carpenter . . .	2,392	0	0
Thom & Strachan, Aberdeen, plumber . . .	1,056	0	0
J. Bannochie & Son, Aberdeen, plasterer . . .	1,009	19	0
J. Morren, Aberdeen, slater . . .	266	5	0
J. Masson & Sons, Aberdeen, painter . . .	371	0	0
J. Abernethy & Co., Aberdeen, iron. . .	333	3	6
J. Laing & Co., Aberdeen, heating . . .	107	17	6
J. Laing & Co., bellhanger . . .	11	15	0

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WORTHINGTON & POWNALL, Manchester (accepted) . . . £1,840 18 3

Per schedule of prices.
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For Alterations to the Red Hall Chapel, Audenshaw, for the Methodist New Connexion. Mr. J. H. BURTON, Architect, Ashton-under-Lyne.

J. ROBINSON, Ashton-under-Lyne (accepted)* . . . 410 16 0

Ten tenders received.
* For revised scheme.

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For Additions, &c., to the Carnarvonshire and Anglesey Infirmary, Bangor. Mr. P. SHEARSON GREGORY, Diocesan Surveyor, Bangor. Quantities by Architect.

Evan Jones, Groeslon, Carnarvon . . .	£4,590	0	0
Owen Morris, Carnarvon . . .	3,900	0	0
Evan Williams, Bangor . . .	3,585	0	0
R. & P. WILLIAMS, The Crescent, Upper Bangor (accepted) . . .	3,453	0	0

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For Building Mixed School, Old Town, for the Barnsley School Board.

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G. Booth, New Mill, near Huddersfield, joinery . . .	335	0	0
W. Dransfield, Barnsley, plumbing . . .	203	0	0
G. Downing, Barnsley, ironwork . . .	145	0	0
M. Fenwick, Barnsley, plastering . . .	95	10	0
W. Beaumont, Barnsley, painting . . .	17	10	0
Fleming, Barnsley, slating . . .	—	—	—

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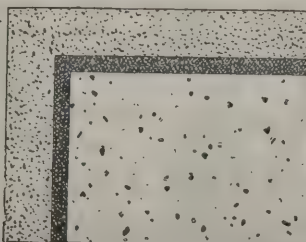
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 HAWKINS & BEST, Teignmouth (accepted) 1,080 0 0

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 A. Berrage, Cardiff 433 0 0
 Cox & Bardo, Cardiff 391 7 0
 J. GIBSON, Cardiff (accepted) 370 0 0

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 H. Dorman 1,263 0 0
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 Kidman, Cambridge 2,470 0 0
 Thoday, Cambridge 2,397 0 0
 Girling, Ipswich 2,395 0 0
 KERRIDGE & SHAW, Cambridge (accepted) 2,378 0 0
 Lindsell, Newmarket 2,228 0 0
 Butt, March 2,181 10 0
 Swann, March 1,918 0 0

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 P. O'Donnell, Kilmallock £384 0 0
 N. Gaffney, Kilmallock 375 0 0
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Stephens, Bastow & Co., Bristol	1,098	0	0
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Hobbs, Chipping Norton	1,017	10	0
Kimberley, Banbury	1,005	0	0
Orchard & Son, Banbury	995	0	0
Wilkins & Sons, Oxford	992	0	0
Hutchins, Oxford	990	0	0
Wiltshire, Swindon	925	0	0
Wastie Bros., Hanborough	915	0	0
Groves, Milton	873	0	0
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Giles & Son, Kenilworth	822	0	0

LONDON.

For Outside Painting at The Brewery, Vauxhall, for the New London Brewery Company, Limited. Mr. WILLIAM J. INGRAM, Architect, 44 Theobald's Road, Bedford Row, W.C.

Sabey & Son	£325	0	0
W. Rowe	303	0	0
White & Co.	221	0	0
J. Sparks	200	0	0
B. E. Nightingale	198	0	0
Mid-Kent Building Company	198	0	0
J. Howlett	173	0	0
E. R. Palmer	160	0	0
Hayworth & Sons	158	0	0
J. Puttick	155	0	0
J. Parsons	145	10	0
J. O. Richardson	145	0	0
J. KNIGHT, Westminster (accepted)	135	17	0

LONDON—continued.

For Painting and Decorating Chapel and for Repairs to Houses of the Licensed Victuallers' Asylum, Old Kent Road, S.E. Mr. W. F. POTTER, Architect. Quantities prepared by Mr. C. R. GRIFFITHS, Surveyor, Bank Chambers, Tooley Street, London Bridge, S.E.

Street, London Bridge, S.E.		Painting, &c., to Chapel.	General Repairs.
Young & Lonsdale	£267	0 0	No price.
W. J. Walker	214	0 0	£273 0 0
Pritchard & Renwick	197	0 0	239 0 0
S. HAYWORTH & SONS (<i>accepted</i>)	178	15 0	239 0 0

For Pulling-down and Rebuilding the Crown Beerhouse, Brandon Street, Walworth, S.E., for the New London Brewery Company, Limited. Mr. WILLIAM J. INGRAM, Architect, 44 Theobald's Road, Bedford Row, W.C.

Sabey & Son	£1,400	0	0
W. Rowe	1,330	0	0
J. Howlett	1,239	0	0
J. Sparks	1,095	0	0
Mid-Kent Building Company	1,095	0	0
J. Parsons	1,090	0	0
White & Co.	999	0	0
J. KNIGHT, Westminster (accepted)	947	17	0

For Alterations and Additions to the Eclipse Beerhouse, for the New London Brewery Company, Limited. Mr. WILLIAM J. INGRAM, Architect, 44 Theobald's Road, Bedford Row, W.C.

W. Rowe	£575	0	0
B. E. Nightingale	525	0	0
J. Sparks	475	0	0
White & Co.	457	0	0
J. O. Richardson	448	0	0
J. Howlett	440	0	0
G. Puttick	423	0	0
J. Knight	417	0	0
MID-KENT BUILDING COMPANY, LIMITED (accepted)	399	0	0

For Works in connection with the Southern Approach Roads to the Blackwall Tunnel, for the County Council.

Kirk & Randall, Woolwich	£79,863	0	0
Reed, Blight & Co., Westminster	68,854	0	0

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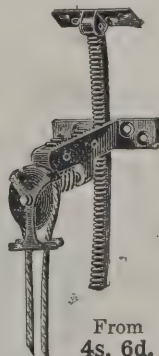
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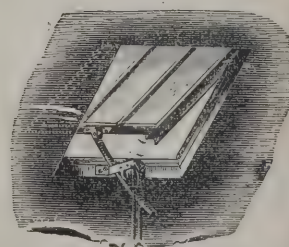
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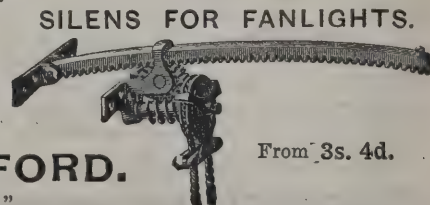


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W., for Messrs. Fargues & Co. Mr. WILLIAM A. BUER,
Architect, 65 Chancery Lane.

Larke & Son	£48	0	0
Hocking	39	10	0
Foxley	39	0	0
STEVENS BROS. (accepted)	37	10	0

For Rebuilding Premises, 22 Houndsditch and 38 Duke Street,
E.C., for Messrs. Steel & Lawson. Mr. E. DEWAR
MATHEWS, Architect.

C. A. King	£3,666	0	0
Grover & Sons	3,598	0	0
Ashby & Horner	3,540	0	0
E. Toms	3,538	0	0
Colls & Sons	3,536	0	0
Mattock Bros.	3,495	0	0
J. Allen & Sons	3,158	0	0

For Additions and other Works at Union Workhouse, St.
Leonard's Street, Bromley-by-Bow, for the Guardians of
Stepney Union.

Nightingale, Albert Works, S.E.	£12,878	0	0
Holland, Poplar	12,590	0	0
Chessum & Sons, Haggerston	12,450	0	0
Shurmur, Clapton	12,357	0	0
Edmunds, Poplar	11,949	0	0
Perry & Co., Bow	11,456	0	0
Johnson, Limehouse	11,277	0	0
Richardson, Peckham	11,129	0	0
Coxhead, Leytonstone	10,823	0	0
WHITE & SON, Bow (accepted)	10,050	0	0

STOKE.

For Additions to Higher School, Stoke, Devon. Mr. W. N.
RICHARDS, Architect, Devonport. Quantities by Mr.

G. H. BRYANT, Plymouth.			
Wakeham Bros, Plymouth	£1,488	0	0
G. Shellabear, Plymouth	1,195	0	0
G. Smith & Son, Devonport	1,174	10	0
Jenkin & Son, Devonport	1,174	0	0
Williams & Westlake, Stonehouse	1,163	0	0
R. Dauke, Plymouth	1,157	0	0
W. Trevena, Plymouth	1,144	0	0
W. LITTLETON, Devonport (accepted)	1,137	0	0

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Contract 1.

J. Maclaren & Co., Gateshead	£6,700	0	0
T. Bell, Market Weighton	6,522	0	0
T. Callaghan, Jarrow-on-Tyne	6,495	0	0
E. Edgar, Benton	6,100	10	0
G. E. Simpson, Newcastle	6,003	10	0
W. Wilson, South Shields	5,892	15	4
T. Dixon, Houghton-le-Spring	5,522	10	0
J. Carrick, Durham	5,133	10	0
J. & S. DOUGLAS, Blyth (accepted)	4,975	15	10

Contract 2.

W. Wilson	718	2	0
T. Callaghan	601	13	0
J. McLaren & Co.	596	12	0
J. Carrick	562	10	9
G. E. Simpson	545	3	6
T. Dixon	504	3	0
J. & S. Douglas	499	18	10
E. Edgar	496	3	7
J. COXON, Seaton Delaval, Northumberland (accepted)	436	14	3

Contract 3.

W. Wilson	85	0	0
J. McLaren & Co.	75	15	6
T. Callaghan	66	2	6
J. Carrick	60	0	0
J. & S. Douglas	56	10	7
T. Dixon	54	8	0
E. Edgar	51	15	9
J. COXON (accepted)	49	19	9

SOMERLEYTON.

For Additions to the Somerleyton Schools, for Sir Savile B.
Crossley, Bart. Messrs. BOTTLE & OLLEY, Architects,
Great Yarmouth. Quantities by the Architects.

J. Rand, Yarmouth	£1,139	0	0
R. Davy, Yarmouth	1,135	0	0
J. Eastoe, Yarmouth	1,025	0	0
G. Beckett, Yarmouth	984	0	0
J. Youngs & Son, Norwich	960	0	0
HORACE LACEY, Norwich (accepted)	937	0	0

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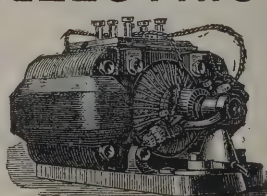
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For Building Three Houses, Spennysmoor. Mr. JOHN WOOD-COCK, Architect, 39 Clydes Terrace, Spennysmoor.			
R. Blackett, Bishop Auckland, excavator, mason and bricklayer's work for three houses of six tenements	£820	0	0
G. Byers, Spennysmoor, joiner's work for three houses of six tenements	517	0	0
J. & H. Batty, Spennysmoor, mason, slating and plastering per houses of two tenements	383	2	3
J. Manley, Bishop Auckland, ditto, ditto	286	8	6
S. Kirby, Bishop Auckland, plasterer's work for fourteen tenements	296	0	0
J. Mascal, Bishop Auckland, slating three houses	68	4	0
H. Barnett, Spennysmoor, glazier's work for three houses of six tenements	38	12	0

WOKING.

For Building Shops and Offices on the Station Estate, for Messrs. Lane Bros. Messrs. HOMER & RIDLER, Architects, 35 Bucklersbury, E.C. Mr. G. SILVESTER, Surveyor, 46 Strand.			
J. Whitburn	£1,810	0	0
Harris & Son	1,772	0	0
Ingram & Sons.	1,723	0	0
Larke & Son	1,494	0	0
A. GALE (accepted)	1,150	0	0

BUILDING AND BUILDERS.

PLANS have been approved for the erection of a Board School for 660 scholars at Frizinghall, Bradford, at a cost of 6,900*l*.

THE Sanitary Committee of the Halifax Corporation have arranged to purchase a site at Belle Vue, Halifax, for a new hospital, at the price of 5,000*l*.

THE committee of the Bridgnorth and South Shropshire Infirmary have decided to accept the offer of Mr. T. Martin Southwell of a plot of land situated at North Gate as a suitable site for a new infirmary, and also to issue a public appeal for subscriptions. The cost is estimated at 4,000*l*.

At the meeting of the Baths and Washhouses Committee of the Leeds Corporation, a selection was made of plans which

it was decided to recommend the Council at its next meeting to adopt for the building of public baths in Kirkstall Road and Union Street. A sub-committee had reduced the plans sent in to three sets.

At a public meeting of persons interested in the Midland Counties Idiot Asylum, Knowle, just held, it was resolved that an appeal should be made for a sum of about 1,200*l*., which is required for the construction of an infectious ward.

THE additions and alterations to the headquarters of the 1st W. Y. V. Royal Artillery, Leeds, were completed last week. The work has been carried out by Mr. William Bakewell, F.R.I.B.A.

At the meeting of the Edinburgh Dean of Guild Court fifteen out of thirty-three applications were granted. Of these one was a warrant to the Governors of George Heriot's Trust for the erection of a large detached hall, on the west side of the hospital, to seat about 1,400 boys.

ACCORDING to the *Engineering News* of New York, over 500 architects have applied for copies of instructions for the New York City Hall competition.

TRADE NOTES.

THE typewriter, we hear, has apparently demonstrated its utility to the Vatican, for the Priory Chamberlain to His Holiness the Pope has just adopted the Yost machine. Announcements are continually being made pointing very conclusively to the almost universal adoption of the typewriter, though for many years the promoters of the writing machine had to complain bitterly of the unreasonable, conservative prejudice of the public.

THE clock on the tower of St. Mark's Church, Wolverhampton, has just had new illuminated dials fitted. They are each 6 feet diameter, and glazed with white opal glass. Automatic clockwork apparatus has been attached to turn the gas up and down for the varying lengths of the days throughout the year. The work has been carried out for the Wolverhampton Corporation by John Smith & Sons, Midland Clock Works, Derby.

MR. JOHN FIELDING, contractor and stone merchant, Alton, Staffordshire, has acquired the Beggar's Well and Battlesteads Quarries, Alton, and invites inspection from archi-

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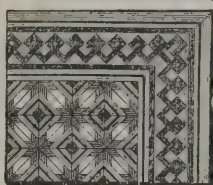
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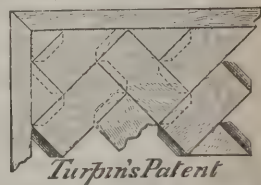
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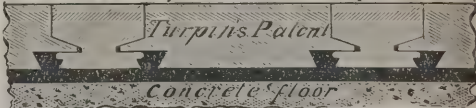
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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fects and contractors. Cheadle Roman Catholic church of St. Giles was built of stone from this quarry fifty years ago, a church well worthy of a visit, and the spire has been a severe and long test of weather qualities of this stone. It was built from the designs of the late Mr. A. W. Pugin, and occupied nearly six years in erecting. It is built of Beggar's Well stone, and was opened September 1, 1846. According to a local description it is the most superb building for ecclesiastical purposes that has been erected in England for many years, and cost the founder 80,000/. The style is that which prevailed during the reign of the Edwards, commonly called Decorated; and no labour or expense was spared in ornamenting both the exterior and the interior with richly sculptured devices, statues, &c.

THE new infectious hospital, Chertsey, is being warmed and ventilated by means of Shorland's patent open fireplace Manchester stoves, with descending smoke flues, the same being supplied by Mr. E. H. Shorland, of Manchester.

THE Parks Committee of the Edinburgh Town Council have recommended the acceptance of a tender amounting to nearly £700 for the formation of the "ride" in Inverleith Park.

THE Thetford Town Council received one tender only for proposed alterations to the shambles and improvements to the outbuildings of the Red Lion Inn at a cost of 451/, from Mr. Broughton. A motion not to accept the tender was defeated and the amendment to accept the tender carried.

MESSRS. THOMAS CRAPPER & CO. write to us:—"We have the pleasure to inform you that in honour of the forthcoming Royal wedding we purpose closing our works on July 6, upon which occasion the whole of our workmen and staff will be given a holiday.

VARIETIES.

THE annual conversazione of the Institute of Electrical Engineers was held on Friday evening, the 23rd inst., in the galleries of the Society of Painters in Water-Colours in Princes' Hall, Piccadilly. The company were received by the president, Mr. W. H. Preece, and Miss Preece. The attendance was very large and the rooms were densely crowded. An excellent programme of music was performed by the band of the Royal Horse Guards (Blues), under their conductor, Mr. Charles Godfrey.

THE *Engineering Record*, New York, says:—It is reported that the State of New York is soon to make experiments on electric towing of canal boats on the Erie Canal. It is well known that Governor Flower has for some time been very confident that such a system of propelling can be successfully applied. So far as estimates have been prepared, it would appear that the expectation is to propel a boat by electricity at a cost of 50 to 60 cents a day, but the actual cost can better be computed after an appreciable amount of experience than at the present time.

AFTER the rejection by the Bristol City Council of the scheme for the construction of new docks at Avonmouth at the cost of a million sterling, several of the Docks Board have resigned, deeming it hopeless to make any further proposal for the development of the trade of the port.

THE Weaver Navigation Bill has been ordered for third reading by the House of Commons, after adoption of an amendment to enable Parliament to deal with the whole question of the constitution and management of the Trust.

ACCORDING to the *Glasgow Herald*, on Monday, the 26th inst., the building in Cathcart Street, Greenock, known as the Tontine Hotel, and recently purchased by the Post Office authorities, on the site of which to erect a new post office, was exposed to public auction by Messrs. Hutchison & Dixon, Glasgow. There was a good attendance of tradesmen and brokers. The bidding was started at 5/., and quickly rose to 125/., at which figure it was knocked down to Mr. Brown, Galloway Street, Paisley. It was reckoned by some of the builders that it would cost over 200/ to remove the material, which must be completed within four months, and that there would be 600 carts of rubbish. The original cost of the building was about 7,000/., and the purchase was made for the Government at about 6,000/.

AN inquiry has been held to consider the application of the Basford Rural Sanitary Authority for sanction to borrow 7,000/ for works of sewerage and sewage disposal for the districts of Codnor and Loscor. The estimated cost of the work is 7,000/ and the engineer is Mr. W. H. Radford, C.E., of Nottingham.

AN inquiry has been held at Lancaster into an application made by the Town Council for sanction to borrow 25,000/., the estimated cost of a system of electric-lighting installation for the borough. For the present the Corporation propose to light only the main streets in the centre of the town; but arrange-

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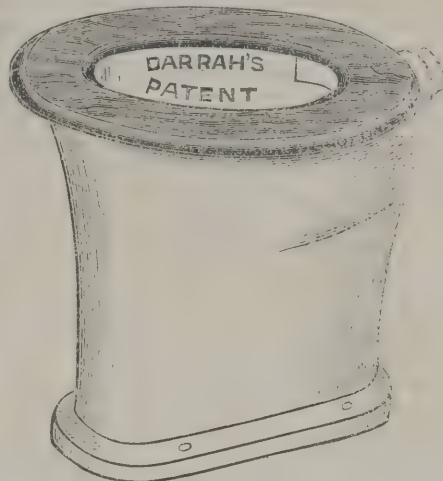
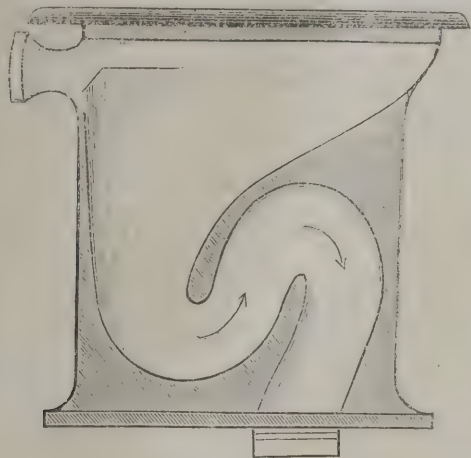
ments are being made so that additional plant may be put down as required.

THE Plans and Works Committee of the Edinburgh Town Council advise the erection of public baths in the north side of the city.

AN inquiry has been held by the Local Government Board in regard to an application of the Improvement Commissioners of Stourbridge for sanction to borrow 5,000*l.* for gas purposes.

A NEW feature has been added to the World's Fair at Chicago by the opening of a wheel 250 feet in diameter, swung on an axle which rests upon towers 135 feet high. Attached to it are thirty-five cars, similar to those used in elevators, each

offered to the public. The closet, named "Darrah's Artisan Wash-down Closet," is fitted with lifting seats, in walnut, mahogany, polished deal, &c. This closet is complete in itself, requires no seat brackets or other-wall fixings, and is thus cheaper, more easily connected, neater and more effective than many closets now in use. It is also open all round, and can harbour no dust or dirt. It is made in different designs, suitable for workshops, cottages or mansions, and is also especially suitable for public buildings, waiting-rooms, railway stations, &c. The closet is made in various designs in fireclay, buff and white, cane and white earthenware, white or ivory earthenware, and also in decorated patterns.



containing seats to accommodate forty persons. The wheel is moved by an engine of 1,000 horse-power, and the occupants of the car make the complete circuit.

NOTES ON NOVELTIES.

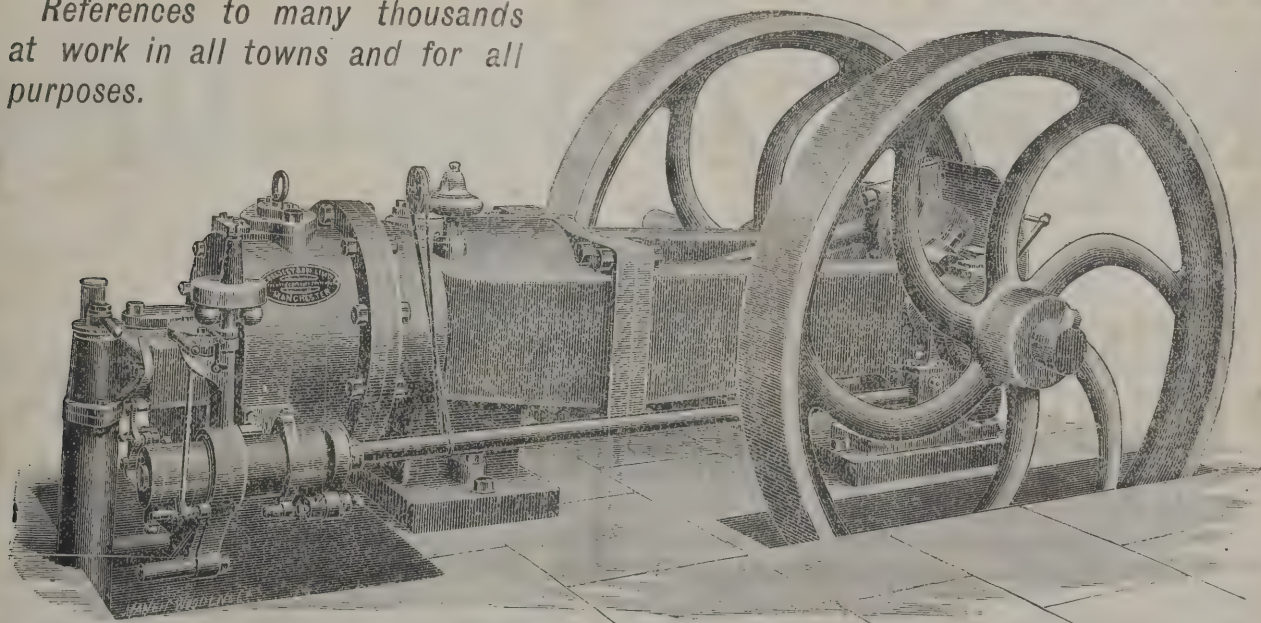
WE illustrate one of the new pattern Darrah's patent pedestal closets, which Messrs. Baxendale & Co., of Manchester and Edinburgh, have recently introduced, and for which there has been so large a demand in the short time they have been

PILE FOUNDATIONS, CHICAGO.

THE use of deep-pile foundations has been strongly advocated as advantageous in Chicago by General William Sooy Smith, M.Am.Soc.C.E., and in a recent issue of the *Technograph* he describes the work done in this direction for the foundations of the new public library building in that city. The system consists in abandoning the spread foundation of steel and concrete resting on the unstable clay which underlies most of the business parts of the city, and to employ instead a foundation of deep piles reaching down to the bed of

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compact clay and gravel about 45 feet below the city datum. The reason advanced for this change by General Smith is that where independent spread foundations are used some of the largest buildings have been observed to settle irregularly after completion. The deep piling is claimed to be much more stable.

In the new public library building trenches were dug on the lines of the walls sufficiently wide to permit the necessary shoring, and to include three rows of piles driven about 3 feet between centres. The character of the upper clay stratum at this place is shown by the fact that it crowded through the smallest crack in the sheet piling almost as if it were quicksand. The depth of excavation permitted sawing and capping the piles to a point such that the highest level of timber used in the grillage is 14 feet below the city datum, which is about the level of Lake Michigan. From this grillage rubble masonry is carried up to the neat masonry courses of the basement. While the work was in progress, a test was made to determine the bearing power of four of the piles of Norway pine, after they had been driven in the trench. The driving was done with a steam hammer weighing in all 8,300 lbs., the hammer alone weighing 4,500 lbs., and delivering 54 blows per minute with a stroke of 42 inches. The last 20 feet of the driving was done by means of an oak follower. These piles were driven about 2½ feet between centres.

The bearing power of the four piles was tested by building a platform on top of them, which was loaded with pig-iron. Levels were carefully taken on each of the four. The piles stood four days with a loading of 5½ tons per pile, eight days with a loading of 37·3 tons per pile, and ten days with a load of 50·6 tons, all without a settlement exceeding 0·01 foot. In discussing these tests General Smith states that if 250 lbs. per square inch be estimated for point resistance, the average frictional resistance will be about 3·2 lbs. per square inch of side surface of pile, or about 432 lbs. per square foot. For an ordinary pile, 7 inches through at the top and 14 inches at the butt, driven 45 feet, the frictional resistance he assumes to be 59,000 lbs. and the point resistance 6,000 lbs. Hence he computes a total earth-resistance of 65,000 lbs., with a factor of safety of from 5 to 6. The resistance of the pile considered as a column he estimates at 65,000 lbs., with a factor of safety of 3 to 4.

Another noticeable building on deep piles is the new Illinois Central Railway passenger station in Chicago, a structure 180 by 220 feet in plan and consisting of an office portion

nine storeys high, a tower thirteen storeys high and a station three storeys high, with which is connected an eight-track trainshed 680 feet long. According to a paper in the same magazine, written by C. J. Mitchell, an assistant civil engineer of the railroad, borings taken on the site showed from 10 to 20 feet of rubbish which had been dumped there immediately after the great fire, below which were irregular strata of stiff blue clay and quicksand. Rock was more than 60 feet below the surface. This condition of things led to the adoption of deep-pile foundations. About 1,700 were driven in all, arranged in groups or clusters under each column. Under the head house there were eight, thirteen and sixteen piles in the groups, under the office twenty to forty-two, and under the tower one of the corner pilasters had seventy-three piles. These piles were usually arranged on the square, lining both ways, but alternating in rows 18 inches apart, so that the distance between centres was 25½ inches. This is said to be as close as they could be driven, and even when the points were spaced in this way the tops were sometimes considerably out of line after driving.

In size the piles were from 40 to 60 feet long, averaging 51 feet, and from 11 to 16 inches through at the butt end. Thirty-two per cent. were black gum, 22 per cent. pine, 7 per cent. basswood, 21 per cent. oak, 15 per cent. hickory, with a few maple and elm. A cast-iron cap was used in driving, but in spite of this 8 per cent. of the heads were crushed or split. The pine piles had the poorest driving record, the heads of 12½ per cent. being crushed and 5 per cent. broken. The gum had 7 per cent. crushed and 0·6 per cent. broken; the oak had 5 per cent. crushed and 0·8 per cent. broken; the hickory had 3 per cent. crushed and none broken, and the basswood had 8 per cent. of the heads crushed. In several of the oak piles the sap wood was separated from the heart, the corks being driven through the shells. All the piles were cut down to form a point 4 inches square.

Drop-hammer drivers were used on this work, the hammers weighing 2,800, 3,200 and 3,800 lbs. respectively. The best record, 26 piles driven home to a depth of at least 60 feet, was made by the driver having the heaviest hammer, although there is some doubt in Mr. Mitchell's mind as to whether this result was due to the greater weight of the hammer or to the greater ability of the crew in charge. The last blow was generally given with a fall of 35 to 40 feet, though when driving close to a building a fall of 50 feet was used with about the same success. The penetration at the last blow averaged about

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3 inches, though a number went less than $1\frac{1}{2}$ inches. The cap prevented much loss by brooming. The distance to which could be traced the vibration due to the driving varied with the fall, the character of the soil, and the spacing of the piles. It was easily felt at 400 feet, while the effect at 75 feet was quite marked. It is stated, however, that in doing instrumental work the vibration was sometimes less severe within 25 feet of the driver than at several times that distance.

The piles were usually driven in groups until the tops of all were below the leads when the driving was completed by means of a follower. Water was kept running around the pile at the surface while the driving was in progress, as this seemed to be of considerable aid. After the piles had been driven the tops were sawed off to a uniform height of 3 feet below datum, in order that all the timber should be below low water. As this was from 10 to 14 feet below the surface the trenches had to be sheathed and kept drained by continual pumping. After the piles were cut off and the earth excavated 18 inches below their tops, rich Portland cement concrete was tamped in even with the tops. Oak caps 12 inches square were then drift-bolted to the centre of each pile, and the space between the timbers filled with concrete. It is believed that this piling will last many years, as pile trestles built twenty-one years ago on the same railway are stated to be perfectly sound now wherever they were below the permanent water level.

A rather interesting set of observations on the effect of pile-driving on adjacent objects is described by Mr. Mitchell. In one instance a group of sixteen piles was driven about 15 feet from a group of eight which had been sawed off to a uniform height and had waling pieces drifted on. These waling pieces were raised 4 inches on the side next the driver and 1 inch on the opposite side. Under similar conditions, when sixteen piles were driven about 15 feet from a finished pier consisting of eight 47-foot piles, $2\frac{1}{2}$ feet of grillage and concrete, and 12 feet of stone masonry, the pier rose $\frac{3}{4}$ inch on the side next the driver, but on the further side it remained at the original elevation. Two weeks later this pier was again tested, and the high side was found only $\frac{1}{4}$ inch too high, while the other side had not changed. Again, in a group of seventy-two piles a spike was placed in the head of the first pile driven, and elevations were taken daily. The first two days the pile sank $\frac{1}{2}$ inch, then rose steadily until fifty piles had been driven, when it was 3 inches above the first height, the greatest rise in one day being $\frac{3}{4}$ inch. This pile was 55 feet long, of which 45 feet was in the ground.

ILLUSTRATIONS.

NEW RESIDENCE, WOKINGHAM.

SHOP AND DWELLING, TOTTENHAM COURT ROAD.

RESIDENCE, LICHFIELD ROAD, ERDINGTON.

AUGSBURG.

NEW CATALOGUES.

WE have received a copy of a new illustrated price list of Whitfield's safes from Messrs. F. Whitfield & Co. of Birmingham, who are sole manufacturers of the patent Sicker safes. The manufacture of safes has been brought to a perfection far beyond what could have been expected, being proof against the terrible onslaughts of fire and the attacks of the cleverest burglars. It would be difficult to produce testimonials to bear witness in regard of safes that have withstood tampering by thieves, burglars, &c., these undesirable persons never now wasting their time over impossibilities. Fires, however, whatever precautions are taken, will and do break out, and however lamentable the destruction of property caused by them, the safes are eventually found to have preserved their contents uninjured however great the fiery ordeal they have been subjected to. Valuables can be insured, but documents and books have a value that no insurance can cover, and many business persons can testify their obligations for the preservation of the documents, papers, &c. which, though of no use to any but the owner, are invaluable to him. Messrs. Whitfield & Co. can show practical evidence of this in the testimonials sent to them by their customers who have lost by fire everything but the contents guarded in the safes. The list illustrates safes ranging from smaller articles such as fire-resisting deed-boxes to the most safe-proof appliance for use of bankers, jewellers, &c. fire and thief-resisting doors, grilles, &c. included. We have so often described the variety of safes and their specialties of character and merit that we need only refer our readers to the catalogue to choose for

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themselves what will suit their particular purpose. The prize medals Messrs. Whitfield & Co. have taken and the approbation afforded them by their clients are a warrant for their selecting as motto "Fast Bind, Fast Find."

A NEW illustrated list of Mason's patent "unwearable" non-slipping stair-treads, hydrant and manhole covers, coal-plates, &c., has been issued, as manufactured by the Safety Tread Syndicate, Limited, of 15 Barbican, E.C. The treads, being a combination of chilled steel, iron or other hardened metal with lead, will be found to be as designated, "unwearable." The two metals are so arranged that the one withstands the wear while the softer one gives the foothold. Worn stone steps also are repaired by this system cheaper than with stone. The coal-plates are made on the same principle as the stair-treads; accidents from slipping on them are impossible. They are supplied either ventilated, illuminated or solid, and are guaranteed to last longer than any other, and to be the only perfect non-slipping coal-plates in the market.

GLASGOW ART GALLERIES.

APPLICATION was made in the Glasgow Dean of Guild Court by the Association for the Promotion of Art and Music in the City for permission to erect new art galleries in Kelvingrove Park. The applicants had the consent of the Lord Provost, magistrates and Town Council. Mr. A. F. Baird, who appeared for the association, explained that on the termination of the Glasgow International Exhibition of 1888 there was a surplus of 46,000*l.*, and the association, which was now before the court, was formed for the purpose of applying that surplus in the erection of public art galleries, a concert-hall and museum. By arrangement with the Corporation, it was agreed that the latter should grant a site for the buildings in Kelvingrove Park, on condition that a sum at least equal to the surplus was raised by subscription, and also that the plans of the buildings should be approved by the Town Council. The association had now collected the sum of 65,000*l.* by subscription, and the plans had received the approval of the Town Council and the city engineer, so that both conditions had been fulfilled. The present application was for authority to erect the basement floor of the proposed buildings, which was all it was intended to do meantime. The application was granted. Messrs. Simpson & Milner Allen, London, are the architects.

SMOKE PREVENTION.*

WHEN fresh coal is thrown on a bed of incandescent coal, or is otherwise highly heated, there immediately begins the distillation of the more volatile portions of the hydrocarbons in the coal, which distilled matter is burned if the temperature is high enough and a sufficient supply of oxygen is present, but which pass up the chimney as yellowish fumes if either of these two essential conditions of combustion are wanting. As the fresh coal becomes more highly heated the less volatile hydrocarbons are distilled, and these being, chemically speaking, unstable compounds, are decomposed or disassociated by the heat at a temperature much below that at which the carbon thus liberated combines with oxygen in combustion. The temperature necessary for combustion of this free carbon is very high; approximately 2,000 deg. F., and hence there is a wide margin of opportunity for this portion of the carbon to escape unburned, as this temperature is somewhat difficult to maintain in the mass of gaseous matter above the coal.

It is this free, unburned carbon, in a finely divided, incandescent state which produces the bright, luminous flame, and which, when cooled, produces the black clouds of smoke that issue from the chimney and which afterward settle as soot. After the volatile matter is all driven off, there still remains the fixed carbon, which now is in the form of coke. This gives but little flame and no smoke in burning, as the particles of carbon are not detached from the solid mass till combustion takes place.

The causes of smoke may, from the foregoing description, be stated to be either:—(1) An insufficient amount of oxygen for the perfect combustion of these combustibles; or (2) an imperfect mixture or distribution of the oxygen with the combustibles, even though present in sufficient quantity; or (3) a temperature too low to ignite the distilled volatile matter and the separated free carbon when properly mixed with the air.

The loss of fuel in the smoke itself is not very serious, as a very dense black smoke represents but a small lot of carbon. The British Smoke Abatement Committee in 1882 estimated the fuel lost in the densest smoke to be less than 1 per cent. of the coal producing it. In our own country Mr. J. C. Hoad-

* From a report to the State Board of Health of Tennessee, by Olin A. Landreth, C.E., Professor of Engineering, Vanderbilt University, and published in the *Engineering News*, New York.

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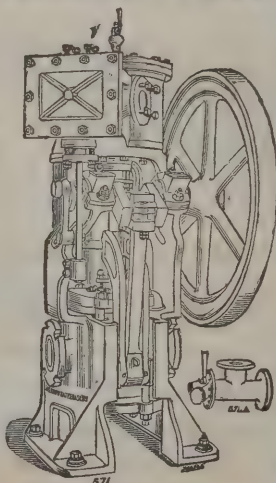
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ley by experimentally passing very dense black smoke from bituminous coal through water and collecting the solid carbon, found that it only amounted to about one-sixth of 1 per cent. of the coal burned. The most serious losses are due to the escape of some of the light hydrocarbons and carbonic oxide—both invisible gases—the former of which has a calorific power nearly double that of pure carbon, and the latter about one-third that of pure carbon. While therefore the losses of fuel are not confined to the smoke itself, still the total losses may be assumed as generally being indicated by the amount of smoke produced, since the conditions that are unfavourable to the combustion of the free carbon, which appears as smoke, are also unfavourable to the combustion of the other combustible gases which tend to escape.

Touching the hygienic effects of smoke, Dr. W. A. Daley, a prominent physician of Pittsburg, stated before the Engineers' Society of Western Pennsylvania, in March 1892, that every medical man in Pittsburg who had made post-mortem examinations recognised the effect of smoke in the darkly-mottled lung-tissue filled with carbonaceous matter, and distinctly stated that this deposit induces consumption of an incurable character. He said that the death-rate in that city during the eight years of freedom from smoke was 1.62 per 1,000 lower than for the preceding eight years of smoke, and that since the partial return of the smoke the death-rate has again risen from 19.58 per 1,000 to 22.15 per 1,000, showing an increase of 2.57 per 1,000, notwithstanding the fact the period of low death-rate included the fatal epidemic of "la grippe" in that city. The increase in Pittsburg's death-rate placed it above those of St. Louis, Chicago, Buffalo, Detroit, Milwaukee, Louisville, Indianapolis and other cities whose hygienic conditions are otherwise not superior to those of Pittsburg. It is well known that carbon, either in the porous form of charcoal, or in the finely divided form as soot, has a very great capacity for the absorption of gases. It is equally well established that floating particles in the atmosphere draw to them the minute spores, organisms and impurities that are ever present in the air about a large city. It is not difficult to imagine, therefore, that the soot that inhabitants of a smoky atmosphere inhale with every breath, but do not exhale, may be the carrier of both noxious gases and organic impurities.

But the sanitary objection to smoke is not the only one. It is objectionable from the disagreeable defacement of public buildings and residences, by the insidious soot which pervades our dwellings, offices, libraries, picture galleries and stores,


injuring our clothing, pictures, books, papers, furniture and *bric-à-brac*. It is objectionable from the fruitless efforts for cleanliness where cleanliness is impossible. It is objectionable from the loss of light and the increased cost of artificial light. It is objectionable from the repression of æsthetic tendencies and the mental and moral depression and discouragement. It is objectionable in its effects on our citizens, many of the more wealthy and cultivated of whom will not remain in an atmosphere of smoke.

The Smoke Remedy.—In the ordinary boiler furnace as generally constructed and fired, the conditions are very unfavourable for perfect combustion during the period in which the volatile matter is being driven off from each charge of coal. When the fixed carbon stage is reached there is but little difficulty in maintaining perfect combustion, but when a fresh charge of coal is added the difficulties appear; the air supply, if not in excess during the burning of the previous incandescent coal, will now be in deficit, since the distillation of the volatile matter calls for an increased amount of air, while in fact the greater depth of coal now on the grate actually reduces the supply. If an additional supply is admitted through the furnace doors it will be cold and cannot be thoroughly mixed with the combustible gases. So with the temperature; if high enough before charging it is now much lower, owing to the cooling effects of the cold air rushing in when the doors are opened, of the mass of cold coal, of the evaporation of the moisture in the coal and of the distillation of the volatile matter, so that by the time a high temperature is needed to burn the free carbon the furnace is at its coldest.

In fulfilling the requirements of sufficiency of supply and thoroughness of mixing the air with the combustible gases, it must be noted that these conditions should not be secured by a reckless surplus of air, as this carries away useful heat, which is not only a loss in itself, but may, and often does, result in lowering the temperature of the combustible gases below their temperature of ignition, thus causing the escape of unburned fuel. Owing to the difficulty of effecting such a thorough mixture as to bring to each combustible particle just its proper amount of air, it is necessary to provide a surplus of air, but this should be considered as an evil to be kept at a minimum by the most thorough mixing possible. Each pound of carbon requires for perfect combustion about 12 lbs. of air, and each per cent. of excess over this amount has the effect to not only reduce the total available heat by about one-eighth of 1 per cent., but reduces the temperature of combustion by about one-

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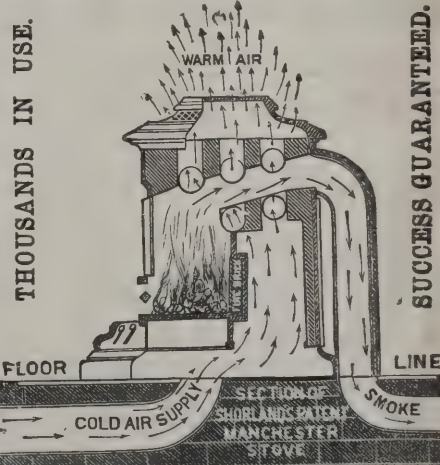
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half of 1 per cent., with the unknown resulting loss of unburned escaped fuel mentioned above.

A very large proportion, probably over 90 per cent., of all the smoke produced comes from steam-boiler furnaces (including those of locomotives and steamboats) and from domestic fires. As to the relative proportion of the two classes, it is doubtful if the former produces as much smoke as the latter in the aggregate; but, coming from forces less scattered and being concentrated in dense black clouds, the smoke from boilers is more noticeable, deposits a larger proportion of soot, and can be more readily reached and more effectively remedied than that from domestic fires. As the combustion in these two cases takes place under radically different surroundings, it will be necessary to treat the subject of smoke-prevention in these two cases under different heads.

Passing to the means of accomplishing combustion without smoke production, it is safe to say that, so far as pertains to steam boilers, the object must be attained by one or more of the following agencies:—

1. By the proper design and setting of the boiler plant. This implies proper grate area, sufficient draught, the necessary air admission space between grate bars and through furnace, and ample combustion room under boilers.
2. By that system of firing that is best adapted to each particular furnace to secure the perfect combustion of bituminous coal. This may be either (a) "coke firing" or charging all coal into the front of the furnace until partially coked, then pushing back and spreading, or (b) "alternate side firing," or (c) "spreading," by which the coal is spread over the whole grate area in thin, uniform layers at each charging.
3. The admission of air through the furnace door, bridge wall or side walls.
4. Steam jets and other artificial means for thoroughly mixing the air and combustible gases.
5. Preventing the cooling of the furnace and boilers by the inrush of cold air when the furnace doors are opened for charging coal and handling the fire.
6. Establishing a gradation of the several steps of combustion so that the coal may be charged dried and warmed at the coolest part of the furnace, and then moved by successive steps to the hottest place, where the final combustion of the coked coal is completed, and compelling the distilled combustible gases to pass through this hottest part of the fire.
7. Preventing the cooling by radiation of the unburned com-

bustible gases until perfect mixing and combustion have been accomplished.

8. Varying the supply of air to suit the periodic variation in demand.

9. The substitution of a continuous uniform feeding of coal instead of intermittent charging.

10. Down-draught burning or causing the air to enter above the grate and pass down through the coal, carrying the distilled products down to the high temperature plane at the bottom of the fire.

The number of smoke prevention devices which have been invented is legion. The scope of the present paper renders anything more than a brief classification of their principles of working impossible. These are:—

(a) Mechanical stokers, which automatically deliver the fuel in a crushed or finely divided state into the furnace at a uniform rate, and also keep the fire clean by a slow but constant motion of the individual sections of the grate. They accomplish their object by means of agencies 5, 6 and 9 of the foregoing list. They effect a very material saving in the labour of firing and are efficient smoke preventers when not pushed above their capacity, and when the coal does not cake badly. They are rarely susceptible to the sudden changes in the rate of firing frequently demanded in service.

(b) Air flues in side walls, bridge wall and grate bars through which air when passing is heated. (Agency 3.) The results are always beneficial, but the flues are difficult to keep clean and in order.

(c) Coking arches, or spaces in front of the furnace arched over, in which the fresh coal is coked, both to prevent cooling of the distilled gases and to force them to pass through the hottest part of the furnace just beyond the arch. The results are good for normal conditions, but ineffective when the fires are forced. The arches also are easily burned out and injured by working the fire.

(d) Dead-plates, or a portion of the grate next the furnace doors, reserved for warming and coking the coal before it is spread over the grate. These give good results when the furnace is not forced above its normal capacity. This embodies the method of "coke-firing" mentioned before.

(e) Down-draught furnaces, or furnaces in which the air is supplied to the coal above the grate and the products of combustion are taken away from beneath the grate, thus causing a downward draught through the coal, carrying the distilled gases down to the highly-heated incandescent coal at the bottom of

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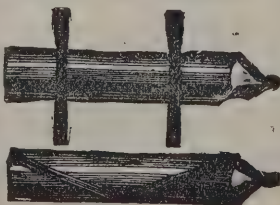
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Passing to the prevention of smoke from domestic fires, the fortunate circumstance is presented that the evil is decreasing, due (1) to the growing tendency to heat all public buildings and large residences by either steam, hot water or hot air, using furnaces either of improved form or such as can be made smokeless by some of the foregoing agencies; (2) to the increasing use of base burners and improved forms of fire-grates, the former of which are practically smokeless and the latter partially so. It will be proper to bring pressure to bear to suppress the smoke from domestic fires, when the more serious and more easily remedied boiler smoke has been abated.

Smoke prevention must be accomplished from the side of the public by educating the people to consider smoke as a nuisance that unquestionably can and should be abated. It is idle to attempt the prevention of smoke by appealing to the interests of the smoke producers, as it is always difficult to prove to their satisfaction the extent to which it is to their interest to prevent its production, and when so proven they are not always willing to give the increased attention and immediate expense to secure the small, continual, prospective savings in fuel. In many cases boilers are being forced much above their maximum proper capacity; in such cases smoking is almost

inevitable, and can only be stopped by reducing them to their proper capacity, which means less steam per boiler and more boilers, the supplying of which, and the alteration necessitated thereby, may cost more than the capitalised amount of the prospective annual saving in fuel. The same may be true of boilers with very defective setting or draught. In all such cases the pressure must be brought from without, and with propriety, for the fact of the increased necessary expenses gives no smoke producer the moral or legal right to pollute the atmosphere and injure the property of thousands or even of one of his neighbours.

It is no longer a problem whether smoke can be prevented or not. This has been settled conclusively in the affirmative in a number of localities where proper laws for smoke abatement have been passed and enforced.

Manchester and Birmingham, in England, and Glasgow, in Scotland, under the action of the Smoke Abatement Act, have had their atmosphere very greatly improved. A prominent citizen of Pittsburg, formerly of Birmingham, says:—"On my recent visit to Birmingham, England, I was surprised to see such a clear atmosphere and smokeless chimneys compared with the Birmingham I saw twenty-one years ago."

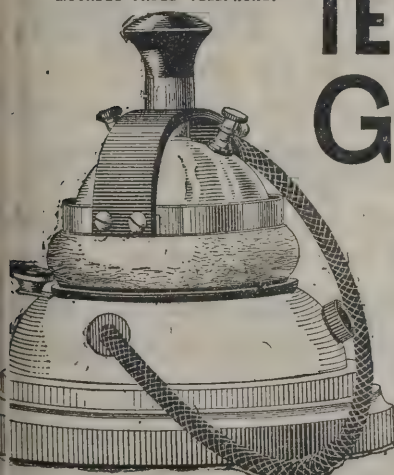
Another resident of Birmingham says:—"Birmingham, a manufacturing town of half a million inhabitants, and using no fuel but bituminous coal, is comparatively clean. . . . The reasons that Birmingham is comparatively clean are, doubtless, the Smoke Consuming Act and the public spirit that sees that it is enforced."

Mr. C. F. White, consulting engineer to the Chicago Society for the Prevention of Smoke, writes under date of May 4, 1893:—

"The experience had in Chicago has shown plainly that it is perfectly easy to equip steam boilers with furnaces which shall burn ordinary soft coal in such a manner that the making of smoke dense enough to obstruct the vision shall be confined to one or two intervals of perhaps a couple of minutes' duration in the ordinary day of ten hours. . . . It is safe to say that the work of the past year has resulted in diminishing the amount of smoke in and about the business centre of Chicago by 75 deg. to 80 deg. as a whole, and there are plenty of individual cases where the abatement will probably reach more than 98 deg. of the smoke made a year ago."

In Cincinnati, where—like Chicago—a law had been on the statute-books for a long time without results because not enforced, a supervising engineer has within a year been

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appointed, and has made substantial progress by securing convictions under the smoke ordinance in a large majority of the suits brought. There has also been a very decided abatement of smoke in a large number of cases notified to abate, and a still larger number are making the changes necessary to accomplish smoke abatement. From his experience of the past few months, the supervising engineer expresses the belief that "within the next three months 500 chimneys will be made smokeless."

These facts establish the possibility of smoke abatement in the cities mentioned, whose conditions are not more favourable for its accomplishment than in hundreds of other cities. Although the technical possibility of smoke abatement is no longer uncertain, there still remain three important steps to be taken before its benefits may be secured by any city. These are:—

1. The education of the people to the objectionable effects of smoke, and to the possibility of its abatement.

2. The enactment of suitable laws for the accomplishment of smoke abatement.

3. The provision for systematic enforcement of the above ordinances by continual inspection and legal prosecutions, and for furnishing to smoke producers, when desired, professional advice and assistance regarding means and appliance for smoke prevention.

The best laws are fruitless without an intelligent public sentiment behind them that will not only support them, but will see that they are enforced. Smoke producers should be encouraged in their efforts to comply with the laws by having the benefit of reliable and professional advice, when desired, to aid them in selecting the most effective and economical means and appliances for smoke prevention from the endless number of good, bad and indifferent inventions that follow in the wake of all smoke reforms, and which appear to the average purchaser to be of equal merit.

AMONG the applications granted by the Glasgow Dean of Guild Court the School Board of Govan got permission to build a new school in Allison Street; Messrs. Moss, Thornton, & Kirk, to make alterations on the Scotia Theatre of Varieties; the Town Council of Glasgow, to erect tramway stables in Maryhill; the Scottish Temperance League, to take down existing buildings on the east side of Hope Street and erect new buildings.

THE ORNAMENTAL TREATMENT OF BRICKS AND IRON.*

It must be fully understood at the outset that the meaning the author intends to convey by the term design is that treatment which, whilst securing the necessary results in regard to purely constructive efficiency and convenience, will aim at a beautiful, effective and pleasing result. Of late years much has been done to improve construction by economic production of the raw material of brick and iron, and also its scientific use in working up and placing in the building; and certainly some of our buildings give astonishing results in this respect. Every attention possible has been paid to getting good results in fireproofing, stability, economy in construction, and greatest efficiency from subsequent use, but at the same time it must be admitted that the efforts to produce an effective and ornamental result have in general been weak and ineffectual. The modern building is a structure reared under widely differing conditions from that of the ancients, not only on account of the difference in domestic, political, religious and commercial circumstances, but also because of the fact that, whereas the range of choice in materials, both in kind and quality, then was extremely limited, whilst in modern times the field is much wider. All this notwithstanding, it is the habit to work the brick and iron by all possible means, and at times no little ingenuity is used in attempts at ill-advised imitations of the old work. It will surely be conceded by all that the architect or the engineer does but little justice to himself and to his work when he hides the elaborately thought-out piece of iron and steelwork, or perhaps brickwork, in a modern edifice by a clothing of trumpery deception in imitation of a Greek or Roman temple, the original of which was in marble. The Grecian development of the Orders, which are now so basely copied, commenced at the building of the wooden hut, with its ungainly trunks of trees as support, but the absurdity was not perpetrated of cutting in stone, when such came to be used, a replica of even the bark and knots that hung to the wooden supports; on the other hand, accepting the general characteristics of the wooden building as a mere foundation to work on, they rapidly improved and suited the design to the more pliable and suitable, but still very different, material, stone, and

* A paper read before the Engineering Association of New South Wales by Mr. Jas. Nangle, and published in the *Australasian Builder*.

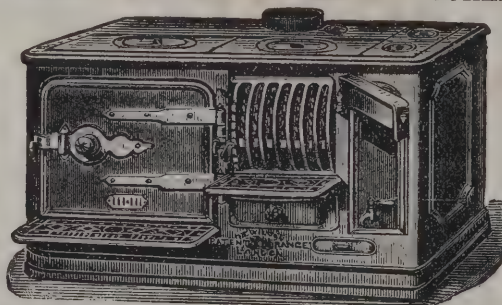
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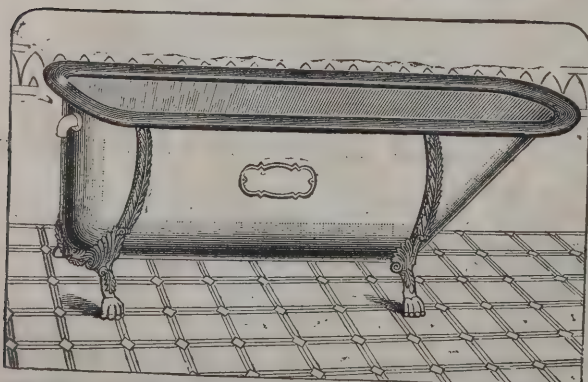


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the results they achieved are world-renowned. The glorious result would never have been had they continued to imitate only. It is in the production of a harmonious suitability of the design to the improved and modern materials and construction that the future of our buildings, as far as appearance is concerned, lies. And the architect or engineer will have to thoroughly understand the requirements of these materials when working them up to give an ornamental result. On account of brick and iron having such a great deal to do in the general formation and construction of our buildings, and moreover as there is every possibility of the use greatly increasing, some attention might with very great advantage be paid to their careful and considerate distribution and treatment.

Bricks.

Brick, unlike iron, is an old building material, evidence existing that it was used in the time of the Egyptians, though at present little other than traces of Roman work exist. The early Egyptians and Greeks used stone in all works of a prominent nature where permanence and durability were aimed at, and the bricks by them were used more generally for smaller works. The brick of to-day has, however, changed very much, both in the method of production and especially in quality, and again, we moderns find it so well suited to grapple with considerations in construction which were never thought of by the ancients; hence we may fairly consider it a modern article, if not in itself at least in the manner in which it is constructively treated. The Romans used the brick to form a body to their walls and then covered the surface with marble or other stone slabs or tiles, and here began the system which is carried to such extremes at present. Brickwork reached a very satisfactory condition in the Middle Ages, and some of the works of that period show that careful consideration was paid to the preparation of suitable designs; however, neither the treatment adopted by the Egyptians, Romans nor any of the Mediæval work is safe to imitate at the present, because naturally as time goes on, convenience and different requirements in setting out the buildings vary so much.

The abominable practice of covering the edge faces of the brickwork with a rendering of cement stucco has obtained a great hold, and too much cannot be said in severe condemnation of the practice; and it is by the aid of this habit that result the cases of wretched deception before referred to. In many buildings it is a common method to cover a really good and thorough brickwork execution with this cement

jacket, and mark out with all the joints and other attendant features of solid stone, and plant on everywhere possible overdone cast cement ornament, and in some cases the deception is enhanced tenfold by painting and sanding in direct imitation of stone. All this then tends to debase brickwork, for when the knowledge exists that the outside is to be covered and hidden, but little attention is given to the facial appearance of the bricks and the method of laying them. When the general advantages of exposed brick surfaces are considered it is surprising that more attention is not given to their adoption. The impervious and vitrified surface of a hard, well-burnt brick is very little affected by the acidulating action of smoke and other fumes peculiar to cities and by the wearing effects of the weather, against all of which both ordinary stone and stucco are weak as a defence. And again the brick is a material that is eminently suited for construction on account of the facility with which it lends itself to the awkward complications and broken up nature of our modern buildings, nor can it be doubted that brick in conjunction with terra-cotta will be a large factor in the buildings of the future. As far as expense is concerned, bricks exposed are much less than stone and very little more than stucco. It should therefore be the duty of the designer to make the external appearance and the surface suitable to and in harmony with such construction. Boldness of form in which the brick is collectively considered should be relied upon rather than a frivolous ornamentation in which the brick is more individually apparent. The builder has at his command such improved methods of economically operating in late years, and as there is every chance of its improvement, it would seem that there is nothing to deter the designer from exercising more courage in setting out bold features, the economical execution of which in older times would have been a deterrent consideration. The Romanesque would seem to be a good model on which to found a design embracing a more characteristic use of the brick. There is in this style something which is strikingly bold, and by making the arch features more apparent, piers rather than columns, together with rejection of the smaller detail ornament, which crept into the late examples, and by a judicious unity in execution, at the same time making all materials—as, for instance, iron—fulfil their part in a harmonious manner, something more simple and more just to ourselves might be produced.

There have been erected recently in Sydney two notable examples of exposed brick surfaces, and one in particular has a most disappointing appearance; the whole effect is oppres-

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sively flat and monotonous, brought about by the entire absence of any boldness of proportion, especially the mouldings of the strings and cornices, which are so ill-proportioned as to be hardly perceptible on the opposite side of the street. There can be no doubt that failures such as these have a very bad influence on the progress of the use of bricks. The work throughout was all that could be desired, as will be understood when it is stated that the facing joints did not exceed $\frac{1}{4}$ inch, and the bricks were not gauged or rubbed, but hard, double-pressed, as they had left the kiln. To an observer interested the lesson given by this example points out that if an effective result is desired it is most necessary that the design shall not rely upon small and insignificant moulds (good work notwithstanding), but rather upon the shaping of parts of the actual building into such forms as will insure effect in proportion, as will be seen in the case of the other of the buildings referred to, which has been treated in a bold manner by an execution in Romanesque. The piers and the fine arches, together with striking breaks and formations in the wall surfaces, and the attention given to colour harmony, cause one when looking at it to forget the brick as an atom and think only of the magnificent whole formed by its use. The knowledge is present to the most simple that it is brick, but there is, co-existent, the impression that the effect is excellent. In this case the architect has given some considerable attention to detail, of course rendered necessary by following closely the style, but it is not too much to say that had most of the detail been omitted the design would not have suffered.

The nature of the modern brick, on account of its hard and finished surface, renders it necessary to impress the mould before being burnt; and so far so good, for it is most desirable that the whole surface, plain and otherwise, of the buildings should be uniform, which would be a matter of impossibility were the attempt made to carve, cut or rob any particular portion, for which bricks less hard would have to be provided. But in this method of previous impression, advantage is taken of the easy method of production to indulge in excess, and the abomination of small and insignificant mouldings is the result. Mouldings which cannot be seen are abortive and useless in any material, and in this case what can be got in the brick itself cannot be carried out when laying it, and nothing looks worse than lines of moulding not perfectly straight and horizontal. The only remedy that remains when such occurs is to straighten up as much as possible by the aid of tuck-pointing. The only logical method of using bricks for mouldings is to

treat them as part of or one member of the mould, than to endeavour to get two or three members in each course of bricks. All attempts at the execution in brickwork of the Classic orders with columns and entablature should be avoided, and the massive detail rendered necessary by the adoption of the Renaissance renders failure certain unless a plentiful mixture of stone is used, which is not always possible.

Colour is a question that requires a great amount of attention when designing, and some of the huge mistakes which almost every city can complain of in the way of glaring examples of red walls lavishly interspersed with bands and all kinds of geometrical patterns in white brick should certainly be things of the past. There can be no doubt that in this particular some advance will have to be made in a general manner by the manufacturers, but it is very certain that none will take place till a firm demand is made by the designer; in fact, none can be expected if the user is content to manage with the result of a loose system, which, as far as colour is concerned, depends merely on what the clay likes to give. It must be confessed that the advance made in controlling the colour return has been nothing compared with what has been done in the fast production of a hard and well-shaped brick, and yet each is equally important and the end will not be reached till such is universally accomplished. By the aid of a little chemical science the clay might be treated in a manner capable of producing any of the ordinary tints, and there is no doubt that if the makers were convinced that the production of such was in their interests the want would soon be satisfied. It should always be remembered that those who help to make a city dull and oppressive by smoke-covered stone and sombre and crumbling stucco, and fail to take advantage of the chance to liven and beautify by the use of inviting coloured material, are to a great extent responsible for that absence of artistic feeling among the lay portion of the people which is so depressing. Nothing could give greater pleasure than tastefully selected and harmonious colours in architectural work, and it would be difficult to find a better means of artistically educating the people.

Iron.

Iron, however, much more than brick, on account of its new and different nature, has great cause to be dissatisfied with the mode of ornamental treatment it has received. Its special qualities as a building material have conferred such general advantages that it is a matter for regret we do not pay the



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attention to its appearance that we give to it in its purely useful capacity. The generous aid which it lends to us in the solution of our building difficulties and the manner in which, by its use, we are enabled to do so much that was hitherto impossible, surely demands that its worth shall cease to be covered by imitative and unsuitable designs. Who is the engineer or architect that has not had reason to be thankful for its aid, perhaps as a girder in getting over a troublesome span where intermediate supports would have been objectionable, or by its use as columns in the little lateral space taken up in proportion to the work done, and where by reason of its bulk stone would have been inadmissible? And yet in return the mean action is taken of covering up the iron girder with wood and cement, and by painting and sanding, making it look like a stone lintel, which could never have done the work. Or in the case of a column by moulding it after a Classic model, totally ignoring the very palpable fact that by its lean shaft all the proportions of the model are lost. On no account should any of the Classic columnar orders be applied to it, for if enough of iron is used to retain the usual proportions waste of material is bound to occur, and on the other hand if the use is made economically the ratio of thickness to height is sure to result in a sickly and lean effect. The advantage of iron is that it enables us to do the work required with much less bulk than if stone, brick or wood were used; therefore it is contended that it is contrary to the ethics of good design to make it appear like those materials when doing its superior work. In the case of the girder or truss surely there can be no logical objection to their straightforward exposure. The rivets and the L irons could easily be left to make a presentable appearance. An example of a girder exposed is to be found in the front of a recent large building erection in Sydney, and it must be admitted that its calm, dignified and straightforward appearance is not unpleasing. The flanges and L irons have been carefully worked, and the heads of the rivets left very clear; but beyond this there is nothing in the way of ornamentation, and none is wanted, for where it has to do laborious work a simple but effectual appearance is the best, and it would be entirely out of place to fancifully ornament it. Deference must of course be paid to the necessity for sheathing the iron columns and girders with fire-resisting material; but this is not always necessary, for there have been one or two examples of iron columns and girders so constructed and arranged that by means of a fusible plug in case of a fire, a continuous stream of cold water will circulate throughout them, provision also being

made that all cradles and seatings should have similar benefit.

Wrought-iron is capable of lending itself to very delicate and artistic treatment, and recourse to it should always be taken to give the necessary contrast to the heavier and more substantial construction. Gates, grilles, railings, finials, &c., are excellent chances to treat in a light way, and the most beautiful results can be obtained. Wrought-iron also enables the architect to do much in the way of roof effects. Every designer can appreciate the addition to the proportions of a building which a raised and curved roof makes, and the strength and pliability of wrought-iron in every way conduces to the easy attainment of such roofs. Sir Gilbert Scott, in "Gothic Architecture, Secular and Domestic," expresses the opinion that "there can be no doubt that the iron roof is susceptible of exquisite beauty." And it would indeed be difficult to prove the contrary. But unfortunately it is seldom that even an attempt is made to gain such a result. It is, however, in its cast state that most of the anomalies exist. At the present there is a term "cast-iron impudence," which is freely used, and actually it might be suggested that it had its origin in the glaring and impudent manner in which cast-iron ornament is plastered over our buildings. It is not going too far to say that almost 80 per cent. of recent erections in the colonies have in some way been made to rely on this stuff for appearance, and yet at the same time it would be impossible to find more than about six different designs amongst the whole. In every city and town is to be found the cast-iron shop, the keeper of which has set out on the walls the same monotonous display of specimens to be found in every other place of a like nature. He calls each design by some fanciful but totally inappropriate name. He sells it by the foot, it is put up by the foot, and the result is a never-ending array of yard after yard of cast-iron, so utterly bereft of any variety or beauty as to be positively offensive to a tasteful eye and totally stamp out even a spark of regard for cast-iron. It is not only the want of variety or beauty in the design, but also the roughness of the casting, no care being taken to preserve a good surface or sharp-edges, and the casting very often appears a confused mass of dots and lumps. It must not be thought that the purpose of this paper is to entirely condemn the principle of treating it for ornamental purposes; but some improvement might be made with advantage in the habit of making in cast-iron an attempt to resemble, for instance, ferns or other vegetable forms. Cast-iron should not be used for purposes of ornamentation only,

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but rather primarily as meeting a necessity and then ornamented to make presentable. As an instance might be taken a column in a store, the plain shaft of which, together with a simple and unostentatious cap merging into a cradle with bracing studs, is far better and more in place than to have an elaborate thing in Corinthian style put in somewhere in the front, with no other reason for its existence than that it is intended to make a nice appearance; or again, would it not be far better to just have a little, but suitable, wrought-iron work, judiciously used, than all the cast-iron fringes, crests, brackets and finials which are so unmercifully used? Cast-iron is best used only when compressive strain is to be resisted, and in such cases it should be very unostentatiously beautiful. If used only for ornamental purposes, the greatest care should always be exercised not to indulge in an excess which is so tempting on account of the ease with which such is produced. All materials which allow of being moulded or cast, and thereby easily multiplied, conduce to quantity in large proportion, to trouble in production, and human nature is so fond of display that the inevitable result is overbearing and debased ornamentation, not so much the consequence of itself in its parts being bad, as because of being in direct violation of the rule, "that of the best we may have too much."

By the foregoing the author hopes to have made as clear as such a short paper can allow that engineers and architects have not done justice to iron and brick when designing for appearance in these materials. The remarks made in the beginning as to the course followed by the Greeks in the development of their styles will have to be taken to heart, and the silent advice given out by their example followed out by those who have to do with our architecture of to-day and in the future, and so long as a harmonious unity in design and material is aimed at, so long will this problem present itself to the designer who attempts to adapt new material to the exigencies of ever changing modern architecture.

COMBERMERE ABBEY.

INSTRUCTIONS have been received by Messrs. E. & H. Lumley, of St. James's Street, in conjunction with Messrs. Osborn & Mercer, from Viscount Combermere to sell the Combermere Abbey Estate, in Cheshire and Shropshire, and the sale will take place at the Mart on July 11. This estate comprises about 9,000 acres, chiefly old pasture used for dairying pur-

poses, and the rental is about 16,500*l*. The abbey is said to have been built in 1133, and, although the exterior has been much altered, parts of the interior remain in their original condition, and some of the walls are 5 feet in thickness. After 400 years in the possession of the Benedictines, the estate was granted by Henry VIII. to Sir George Cotton. The abbey stands beside a natural lake, about two miles long and 134 acres in extent, and is surrounded by 1,000 acres of finely-timbered park. The abbey is situated about three miles from Wrenbury Station, which is on the estate, and twelve miles from Crewe. It may be mentioned that the house was occupied for two hunting seasons by the Empress of Austria.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 11476. William Reid, for "Improved equilibrium valves."
- 11525. Philemon Zahringer, for "An improved fire-escape."
- 11570. Thomas F. Clark, for "Adjustable packing-block and lifting-jack for short distances."
- 11572. Benjamin Pounder, for "Improvements in hinges or pivots and their mountings for desks, lockers and the like."
- 11632. Joseph Crawhall Chapman, for "Improvements in draught appliances for smoke-stacks and the like."
- 11681. George Worrall, for "Certain improvements in door locks and night latches."
- 11690. John Robinson, for "An improved smoke consumer."
- 11704. Thomas Edward Philips, for "The independent action ball and valve."
- 11776. Charles Ross, for "The safety door-fastener."
- 11953. Frederick Baker, for "Improvements in fire-guards."

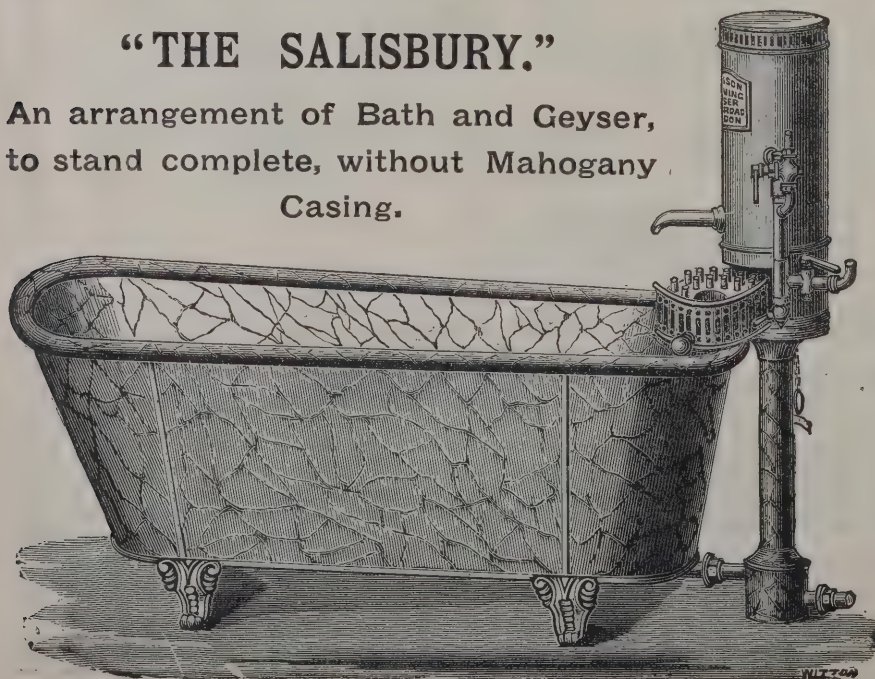
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